DRAFT ENVIRONMENTAL ASSESSMENT/
FINAL ENVIRONMENTAL IMPACT REPORT
EEA# 16433

Runway 27 End Runway Safety Area Improvements Project

Boston Logan International Airport

East Boston, Massachusetts

PREPARED FOR

Massachusetts Port Authority

PREPARED BY

December 2022

PREPARED FOR

Massachusetts Port Authority

PREPARED BY

WSP USA, Inc.
Vanasse Hangen Brustlin, Inc.
Harris Miller Miller & Hanson, Inc.

Cover image: NearMap March 23, 2022

Draft Environmental Assessment/
Final Environmental Impact Report

EEA# 16433

Runway 27 End Runway Safety Area Improvements Project

Boston Logan International Airport

EAST BOSTON, MASSACHUSETTS

Prepared for: **Massachusetts Port Authority**

Prepared by: WSP USA, Inc.
Vanasse Hangen Brustlin, Inc.
Harris Miller Miller & Hanson, Inc.

December 2022

This Environmental Assessment becomes a federal document when evaluated, signed and dated by the Responsible FAA Official.

Responsible FAA Official

Date

Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909
Telephone (617) 568-5000
www.massport.com

December 15, 2022

The Honorable Beth Card, Secretary
Tori Kim, Director of MEPA Office
Executive Office of Energy and Environmental Affairs
Attn: MEPA Reviewer (EEA #16433)
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Cheryl Quaine, Environmental Protection Specialist
Federal Aviation Administration
New England Region
1200 District Avenue
Burlington, MA 01803

Re: Boston Logan International Airport
Runway 27 End Runway Safety Area Improvements Project
Draft Environmental Assessment/Final Environmental Impact Report EEA #16433

Dear Secretary Card, Director Kim, and Ms. Quaine:

On behalf of the Massachusetts Port Authority (Massport), we are pleased to submit the *Draft Environmental Assessment/Final Environmental Impact Report* (Draft EA/Final EIR) for the Boston Logan International Airport Runway 27 End Runway Safety Area Improvements Project (the Project) for public review in accordance with the Massachusetts Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA) regulations. This document responds to all requirements of the Draft Environmental Impact Report (Draft EIR) Certificate issued on August 29, 2022.

As was outlined in the June 30, 2022 Draft EIR, Massport has a continuing program of enhancing airfield safety at all its airports, including enhancing the Runway Safety Area (RSA) at the Runway 27 End at Boston Logan International Airport (Logan Airport). Federal Aviation Administration (FAA) policy requires that Massport enhance the RSA, to the extent feasible, to be consistent with the current FAA airport design criteria for RSAs and to improve rescue access in the event of an emergency. **This Project would not extend the usable length of the runway nor have any effect on normal runway operations, runway capacity, or types of aircraft that use the runway.**

Because of Logan Airport's location, surrounded on three sides by Boston Harbor, any improvement to the Runway 27 End RSA would require work in the marine intertidal and subtidal areas. Massport has worked closely with FAA on the conceptual design of the proposed safety improvements to avoid and minimize impacts; however, there are no feasible alternatives that both meet FAA safety requirements and avoid marine resource impacts. Recognizing this at the outset, Massport proactively reached out to key local, state, and federal resource agencies well in advance of any regulatory filings to begin the development of mitigation strategies, while continuing to explore impact avoidance opportunities. The Draft EA/Final EIR summarizes and reports on these efforts since the publication of the Draft EIR. In response to comments on the Draft EIR, we have also included additional details that explain why several of the alternatives discussed in the Environmental Notification Form (ENF) and Draft EIR were dismissed and the roles of both FAA and Massport in this process.

To minimize environmental impacts to Boston Harbor, in 2019, FAA determined the preferred option to enhance the Runway 27 End RSA is an approximately 650-foot-long by 306-foot-wide RSA on a pile-supported deck with an Engineered Materials Arresting System (EMAS) installed on the deck. Because of the unique environmental setting and the extraordinary cost of the type of structure proposed, FAA approved the narrowing of the pile-supported

deck from the required 500-foot-wide deck to a 300-foot-wide deck (the actual width of the deck would be 306 feet to allow for safety rails) as past FAA projects have shown that this would provide an equivalent level of safety as a full-dimensional RSA. An EMAS is constructed of collapsible concrete blocks with predictable deceleration forces. In an emergency, if an aircraft rolls into an EMAS, the tires of the aircraft collapse the lightweight concrete, and the aircraft is slowed down in a way that minimizes damage to the aircraft. Because of the irregular shoreline in this area, it is expected that the 306-foot-wide deck would extend approximately 450 feet over Boston Harbor. The Proposed Project will not lengthen Runway 9-27 nor change how it operates – this is a safety enhancement only.

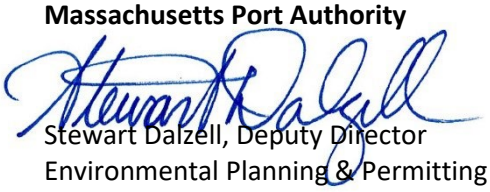
Through use of EMAS and the narrowing of the deck, the Project would minimize coastal impacts while enhancing safety for Logan Airport's air passengers. Since the Project, once completed, would not change how Logan Airport operates, this Draft EA/Final EIR focuses on measures to avoid and minimize construction-period impacts and associated mitigation. In addition, the Draft EA/Final EIR provides more context on potential impacts to air quality, Environmental Justice (EJ) communities, and climate change-related impacts.

Massport has worked with FAA and the MEPA Office to develop a concurrent MEPA and NEPA review for the Draft EA/Final EIR. The 30-day public comment period would begin on December 23, 2022 coincident with the publication of the MEPA *Environmental Monitor*, and would conclude on January 23, 2023. This coordinated review also serves as the federal public NEPA review, including for FAA's Draft Finding of No Significant Impact (FONSI), which is included as Appendix D. Parties on the distribution list are being sent a link to an electronic copy of the Draft EA/Final EIR. The document will be available at several public libraries and on Massport's website (https://www.massport.com/logan-airport/about-logan/environmental-reports/). Consistent with evolving MEPA guidance on outreach with EJ populations, the Draft EA/Final EIR describes outreach to date.

Massport hopes that you and other reviewers of the Draft EA/Final EIR find that the document answers the questions raised during the Draft EIR review and provides the basis for streamlining final permitting. We look forward to your review and to close consultation with you and other reviewers in the coming weeks. Please feel free to reach me at 617-568-3524 or by email at sdalzell@massport.com.

Sincerely,

Massachusetts Port Authority



Stewart Dalzell, Deputy Director
Environmental Planning & Permitting
Strategic & Business Planning Department

cc: S. Dennechuk, F. Leo, B. Washburn/Massport
C. Quaine, L. Lesperance/FAA
Kristen Bergassi/VHB
Marla Engel/WSP

Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909
Telephone (617) 568-5000
www.massport.com

15 de diciembre de 2022

Honorable Beth Card, Secretaria
Tori Kim, Directora de la Oficina de la MEPA
Oficina Ejecutiva de Energía y Asuntos Ambientales
At.: Revisor de la MEPA (EEA N.º16433)
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Cheryl Quaine, Especialista en Protección Ambiental
Administración Federal de Aviación
Región de Nueva Inglaterra
1200 District Avenue
Burlington, MA 01803

Asunto: Aeropuerto Internacional Logan de Boston
Proyecto de mejoras en el área de seguridad del extremo de la pista 27
Evaluación ambiental preliminar / Informe final de impacto ambiental EEA N.º 16433

Estimada secretaria Card y directora Kim:

En nombre de la Autoridad Portuaria de Massachusetts (Massport), nos complace presentar la *Evaluación ambiental preliminar / Informe final de impacto ambiental* (EA preliminar / EIR final) para el Proyecto de mejoras del área de seguridad del extremo de la pista 27 del aeropuerto internacional Logan de Boston (el Proyecto) para la revisión pública de acuerdo con las reglamentaciones de la Ley de Políticas Ambientales de Massachusetts (MEPA) y de la Ley de Política Medioambiental Nacional (NEPA). Este documento cumple con todos los requisitos del certificado del Informe preliminar de impacto ambiental (EIR preliminar) emitido el 29 de agosto de 2022.

Como se indicó en el EIR preliminar del 30 de junio de 2022, Massport cuenta con un programa continuo de mejoras de la seguridad de los aeródromos en todos sus aeropuertos, incluida la mejora del área de seguridad de pista (RSA) en el extremo de la pista 27 del aeropuerto internacional Logan de Boston (aeropuerto Logan). La política de la Administración Federal de Aviación (FAA) exige que Massport mejore la RSA, en la medida de lo posible, para que sea compatible con los criterios actuales de diseño de aeropuertos de la FAA para las RSA y para mejorar el acceso para un rescate en caso de emergencia. **El proyecto no ampliaría la longitud utilizable de la pista ni tendría efecto alguno en las operaciones habituales de la pista, la capacidad o los tipos de aeronaves que transitan por la pista.**

Debido a la ubicación del aeropuerto Logan, rodeado en tres de sus extremos por el puerto de Boston, cualquier mejora en el área de seguridad del extremo de la pista 27 supondría trabajos en las zonas marinas intermareales y submareales. Massport ha trabajado en estrecha colaboración con la FAA en el diseño conceptual de las mejoras de seguridad previstas a fin de evitar y minimizar los impactos; sin embargo, no hay alternativas viables que cumplan con los requisitos de seguridad de la FAA y, al mismo tiempo, eviten los impactos en los recursos marinos. Sabiendo esto desde un comienzo, Massport se comunicó, de manera proactiva, con los principales organismos de recursos locales, estatales y federales mucho antes de las fechas de las presentaciones reglamentarias para comenzar a desarrollar estrategias de mitigación, al tiempo que se evaluaban opciones para evitar el impacto. El EA preliminar / EIR final resume y describe estas iniciativas desde la publicación del EIR preliminar. En respuesta a los comentarios sobre el EIR preliminar, también hemos incluido otros detalles que explican por qué varias de las alternativas descritas en el Formulario de notificación ambiental (ENF) y el EIR preliminar fueron descartadas, y el papel tanto de la FAA como de Massport en este proceso.

Para minimizar los impactos ambientales en el puerto de Boston, en 2019, la FAA determinó que la mejor opción para mejorar el RSA del extremo de la pista 27 es un RSA de aproximadamente 650 pies de largo por 306 pies de ancho sobre una cubierta apoyada en pilotes con un sistema de detención de materiales de ingeniería (EMAS) instalado en la cubierta. Debido a la particularidad del entorno ambiental y al costo excepcional del tipo de estructura propuesta, la FAA aprobó que la cubierta apoyada en pilotes se redujera de los 500 pies de ancho requeridos a una cubierta de 300 pies de ancho (el ancho real de la cubierta sería de 306 pies para admitir barreras de protección), ya que proyectos anteriores de FAA demostraron que esto ofrecería el mismo nivel de seguridad que un RSA con las dimensiones exigidas. El EMAS se construye con bloques de hormigón que ceden con fuerzas de desaceleración calculadas. En caso de emergencia, cuando una aeronave avanza sobre el EMAS, el hormigón aligerado se aplasta bajo los neumáticos de la aeronave, que desacelera de modo de no sufrir mayores daños. Debido a las irregularidades de la costa en esta zona, se prevé que la cubierta de 306- pies de ancho se extienda aproximadamente 450 pies sobre el puerto de Boston. El proyecto propuesto no extenderá la pista 9-27 ni alterará su funcionamiento; se trata únicamente de una mejora de la seguridad.

Mediante el uso del EMAS y la reducción del ancho de la cubierta, el proyecto minimizaría los impactos costeros y mejoraría la seguridad de los pasajeros en el aeropuerto Logan. Dado que el proyecto, una vez completado, no modificaría el funcionamiento del aeropuerto Logan, este EA preliminar / EIR final se centra en las medidas para evitar y minimizar los impactos durante el período de construcción y la mitigación correspondiente. Por otra parte, el EA preliminar / EIR final ofrece más contexto sobre los posibles impactos en la calidad del aire, las comunidades de justicia ambiental (EJ) y los impactos relativos al cambio climático.

Massport ha trabajado con la FAA y la Oficina de la MEPA para elaborar una revisión conjunta de la MEPA y la NEPA para el EA preliminar / EIR final. El período de comentarios públicos de 30 días comenzaría el 23 de diciembre de 2022, en coincidencia con la publicación del *Monitor Ambiental* de la MEPA, y concluiría el 23 de enero de 2023. Esta revisión coordinada también sirve como revisión pública federal de la NEPA, incluido el documento preliminar de la Determinación de impacto no significativo (FONSI) de la FAA, que se incluye como Anexo D. Las partes incluidas en la lista de distribución recibirán un enlace para acceder a una copia electrónica del EA preliminar / EIR final. El documento estará disponible en varias bibliotecas públicas y en el sitio web de Massport (https://www.massport.com/logan-airport/about-logan/environmental-reports/). En línea con la evolución de las directivas de la MEPA sobre la divulgación entre las comunidades de justicia ambiental, el EA preliminar / EIR final describe la difusión realizada hasta la fecha.

Massport espera que ustedes y otros revisores del EA preliminar / EIR final encuentren que el documento responde a las preguntas planteadas durante la revisión del EIR preliminar y aporta los fundamentos para agilizar el permiso final. Quedamos a la espera de su revisión y esperamos poder finalizar la consulta con ustedes y otros revisores en las próximas semanas. Pueden comunicarse conmigo por teléfono al 617-568-3524 o por correo electrónico a sdalzell@massport.com.

Atentamente,

Autoridad Portuaria de Massachusetts

Stewart Dalzell, Subdirector
Planificación Ambiental y Permisos
Departamento de Planificación Estratégica y Comercial

cc: S. Dennechuk, F. Leo, B. Washburn/Massport
C. Quaine, L. Lesperance/FAA
Kristen Bergassi/VHB
Marla Engel/WSP

Table of Contents

Appendices

List of Figures

List of Tables

Acronyms

Acronym	Description
AC	Advisory Circular
ACS	American Community Survey
ADG	Airplane Design Group
AEDT	Aviation Environmental Design Tool
AHW	Annual High Tide
AIP	Airport Improvement Program
APE	Area of Potential Effect
ASDA	Accelerate-Stop Distance Available
BCC	Boston Conservation Commission
BFE	Base Flood Elevation
BMP	Best Management Practices
BUAR	Board of Underwater Archaeological Resources
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CIP	Cast-in-place
CMP	Construction Management Plan
CMR	Code of Massachusetts Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DEIR	Draft Environmental Impact Report
DGA	Designated Geographic Area
DMF	Massachusetts Division of Marine Fisheries
DNL	Day-Night Average Sound Level
DOT	Department of Transportation
DPH	Department of Public Health
EA	Environmental Assessment
EDR	Environmental Data Report
EEA	Executive Office of Energy and Environmental Affairs
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EJ	Environmental Justice
EMAS	Engineered Materials Arresting System
ENF	Environmental Notification Form

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GIS	Geographic Information System
HIRLS	High Intensity Runway Edge Lights
ISA	Inclined Safety Area
ISI	Institute for Sustainable Infrastructure
LAHSO	Land and Hold Short Operations
LDA	Landing Distance Available
LED	Light-Emitting Diode
LSTA	Land Subject to Tidal Action
MassDEP	Massachusetts Department of Environmental Protection
MCAC	Massport Community Advisory Committee
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
M.G.L.	Massachusetts General Law
MHC	Massachusetts Historical Commission
MHW	Mean High Water
MLW	Mean Low Water
MLLW	Mean Lower Low Water
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHESP	Natural Heritage and Endangered Species Program
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
O_3	Ozone
Pb	Lead
PM	Particulate Matter
RIM	Runway Incursion Mitigation
RMAT	Resilient Massachusetts Action Team
RSA	Runway Safety Area
SHMCAP	State Hazard Mitigation and Climate Adaptation Plan
SIP	State Implementation Plan
SO_X	Sulfur Oxides
SRDSG	Sustainability and Resiliency Design Standards and Guidelines
TSS	Total Suspended Solids
TOY	Time-of-year
U.S.	United States
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard

USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	Volatile Organic Compounds
WPA	Wetlands Protection Act

ES
Executive Summary

ES.1 Introduction

The Massachusetts Port Authority (Massport) is proposing to improve the Runway Safety Area (RSA) at the end of Runway 27 at Boston Logan International Airport (Logan Airport or the Airport), adjacent to Boston Harbor (refer to **Figure ES-1**). The proposed Runway 27 End RSA Improvements Project (the Project or the Proposed Project) is required to meet the RSA design criteria in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13B, *Airport Design*,[1] and to enhance rescue access in the event of an emergency. **This Project is a required FAA safety project that would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that use the runway**.

ES.1.1 MEPA and NEPA Process Status Summary

On August 31, 2021, Massport filed an Environmental Notification Form (ENF) with the Executive Office of Energy and Environmental Affairs (EEA) in accordance with the Massachusetts Environmental Policy Act (MEPA). On June 30, 2022, Massport filed a Draft Environmental Impact Report (EIR) for the Project with the EEA. The Secretary of EEA issued a Certificate on August 29, 2022, confirming that the Draft EIR complied with regulations and outlining the scope of this Final EIR (see Appendix A, *Response to DEIR Comments*).

The Proposed Project, which is referred to as the "Proposed Action" per the National Environmental Policy Act (NEPA), is subject to review under NEPA, and FAA determined that an Environmental Assessment (EA) is the appropriate level of review. As required by NEPA, this Draft EA describes the Proposed Action and alternatives considered by Massport and FAA, documents the potential environmental effects associated with the construction and operation of the Project, and where necessary, identifies measures to avoid, minimize, or mitigate impacts.

ES.1.2 Public and Agency Coordination

In coordination with FAA, Massport received input throughout the Project from regulatory agencies, elected officials, representatives in East Boston and Winthrop, the Massport Community Advisory Committee (MCAC), the public, and community groups. Additional coordination information is provided in Appendix A, *Response to DEIR Comments*, and Appendix E.5, *Updated Environmental Justice Outreach Plan*.

1 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

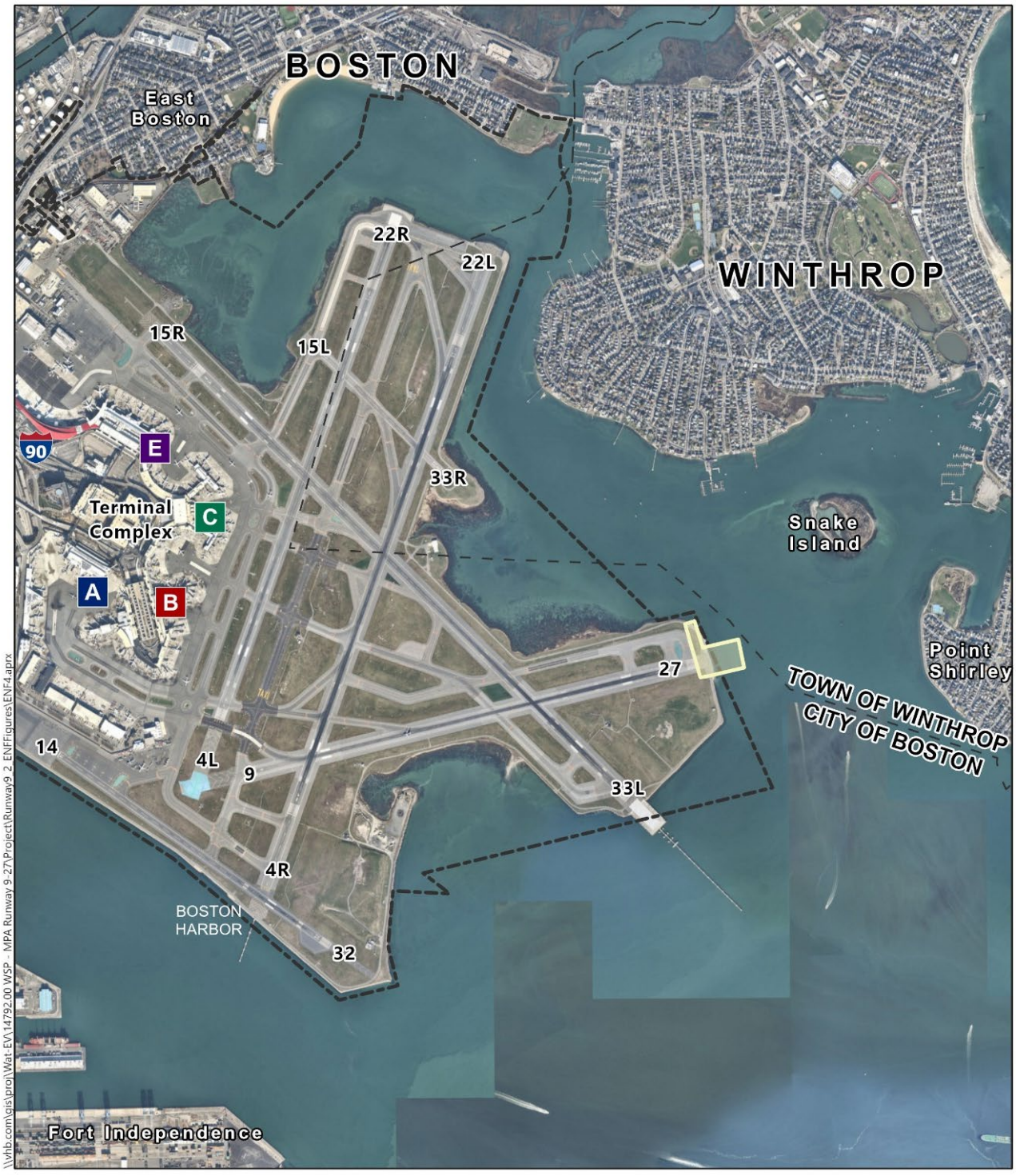


FIGURE ES-1: Logan Airport Aerial **Runway 27 End RSA Improvements Project**

Proposed Project Site
Logan Airport Property Line
Political Jurisdictions

0 1000 2000 4000 Feet

Sources: VHB 2021, ESRI, Nearmap Imagery March 2022

ES.2 Project Description and Purpose

The purpose of the Project is to enhance safety for aircraft and their passengers in emergency situations by improving the Runway 27 End RSA. The Project would advance an overriding public interest of safety consistent with Title 49 of U.S. Code Section 47101, which states "the safe operation of the airport and airway system is the highest aviation priority."[2] **The Project is a required FAA safety project that would not extend the runway or affect normal runway operations, capacity, or types of aircraft using the runway.**

An RSA is a flat surface surrounding the runway that is clear of obstructions. FAA requires airports to provide RSAs at runway ends and on the sides of a runway to reduce risk of injury and damage to aircraft. Runway 9-27, at 7,001 feet long and 150 feet wide, is classified as a Runway Design Code D-V runway. FAA design standards therefore require Runway 9-27 to have an RSA measuring 1,000 feet long beyond each end of the runway and 500 feet wide.[3] As shown in **Figure ES-1**, the Runway 27 End (east end of Runway 9-27) is on the eastern edge of the airfield, adjacent to Boston Harbor. The Runway 27 End RSA is only 150 feet long and does not meet FAA's RSA length requirement of 1,000 feet for a full dimension RSA (see **Figure ES-2**).

Figure ES-2 Runway 27 End - Existing Runway Safety Area

ES.3 Alternatives Considered

In 2017, the FAA directed Massport to conduct a *Boston Logan Airport Runway Incursion Mitigation Study/ Runway 9-27 Runway Safety Area (RSA) Alternatives Study* to determine feasible and reasonable alternatives to bring the Runway 27 End RSA into compliance (see Appendix B, *RIM Study)*. Six build alternatives and the No Action Alternative were evaluated in the Tier 1 Alternatives Screening. Based on the findings, FAA

2 U.S. Code, Title 49, Subtitle VII, Part B, Chapter 471, Subchapter I, Section 47101 – Policies, (a) General (1).
3 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, Table G-11, March 31, 2022.

concluded that Alternative 4B, which consists of an approximately 650-foot-long RSA with an Engineered Materials Arresting System (EMAS)[4] on a 306-foot-wide deck, was the Preferred Alternative. A No Action Alternative was also carried forward for environmental review per MEPA and NEPA requirements.

A second-tier alternatives evaluation was conducted to determine the appropriate deck support structure. Two types of structures were considered: piles and caissons.[5] Four alternatives for supporting the deck were evaluated**.** The analysis found Deck Support Alternative 2 would have the least impact on environmental resources and could be constructed with the least airfield operational impacts. Deck Support Alternative 2 was carried forward as the Proposed Action for further analysis, along with the No Action Alternative.

ES.4 Summary of Proposed Improvements

As shown in **Figure ES-3**, Massport would construct a 650-foot-long RSA with an EMAS on a pile-supported deck (approximately 450 feet long by 306 feet wide). The Project would consist of the following:

- Extending the existing Runway 27 End RSA to accommodate a steel sheet pile wall at the inshore limit of the deck to prevent settlement and erosion of the upland areas;
- Installing a transition slab spanning from the land to the pile-supported structure;
- Installing a deck structure approximately 450-feet-long and 306-feet-wide (an area of approximately 137,700 square feet [3.2 acres]), supported by 326 twenty-inch square concrete piles;
- Installing an EMAS approximately 500-feet-long by 170-feet-wide located within the RSA deck;
- Straightening and realigning the existing 20-foot-wide airport perimeter road to enhance vehicular sight lines and situational awareness;
- Installing two emergency access ramps, one on each side of the proposed deck;
- Adding life rings on the deck to enhance access in and out of the water in an emergency; and
- Installing safety railings along the sides and end of the proposed RSA deck.

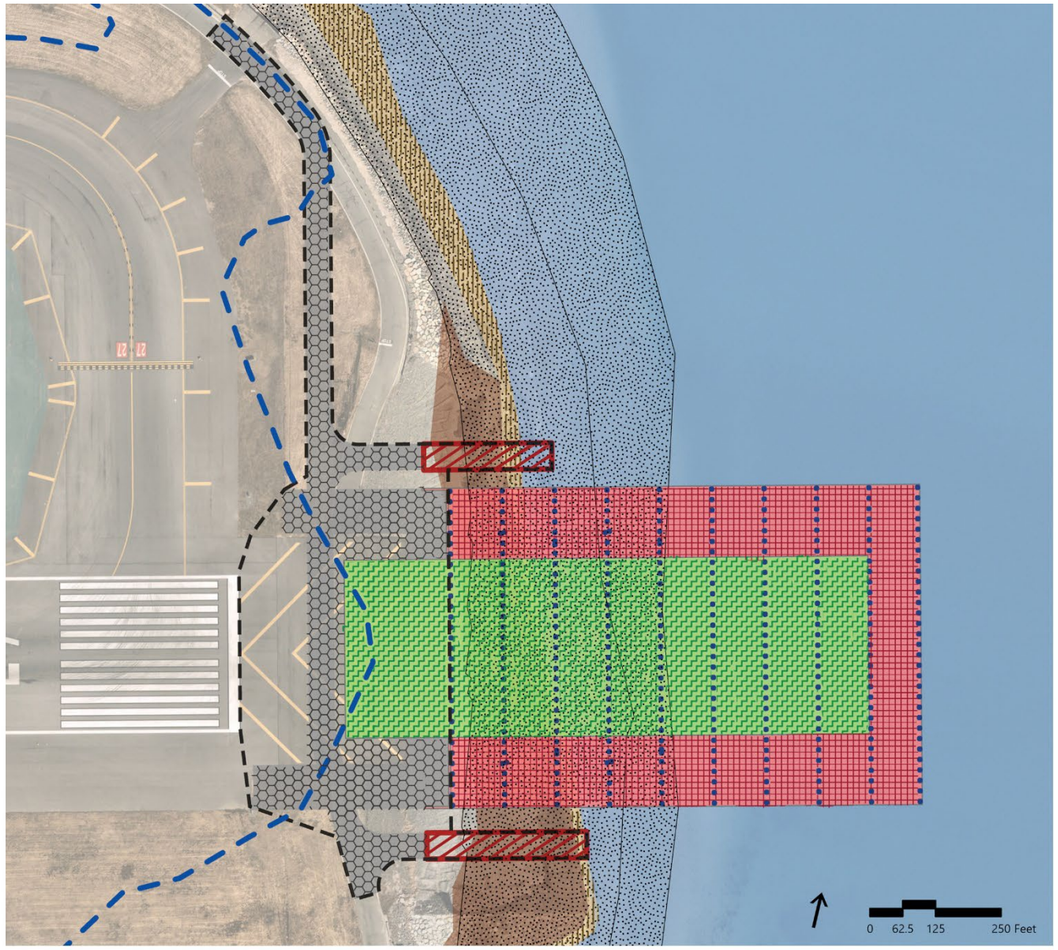
ES.5 Environmental Impacts

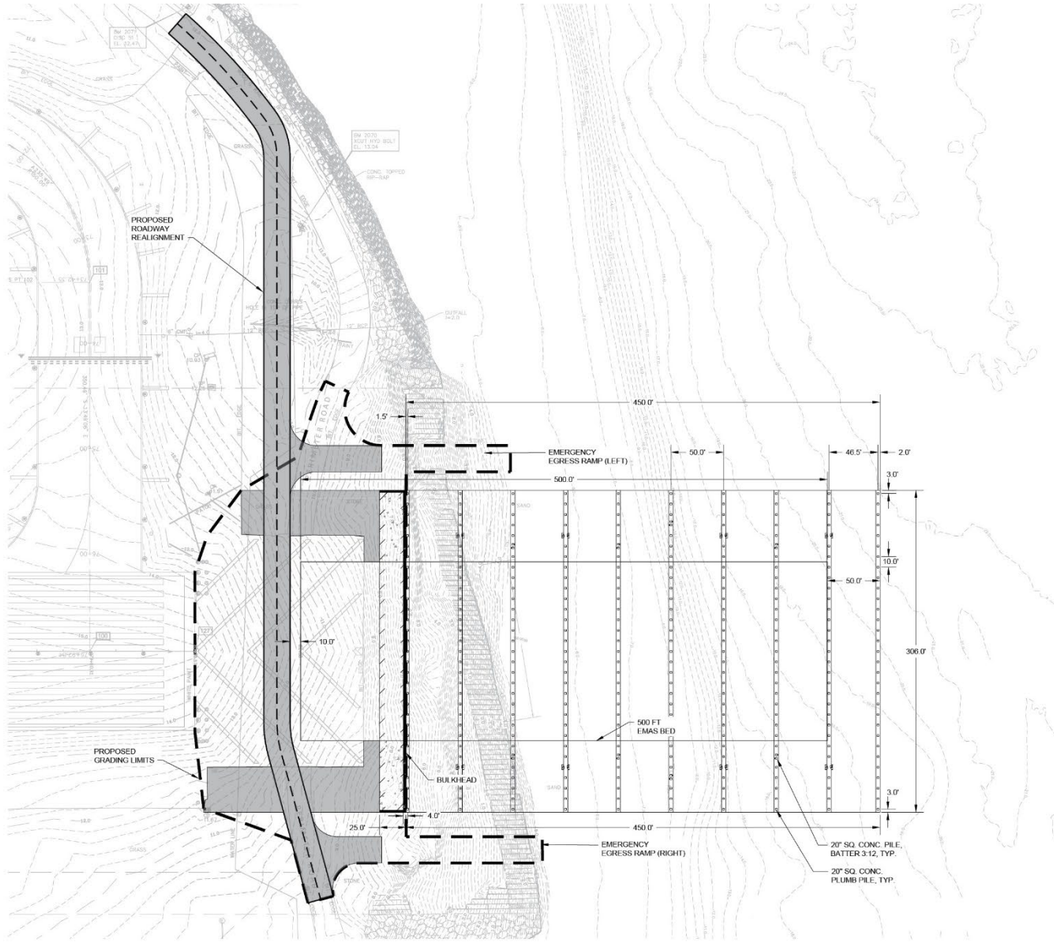
The Draft EA/Final EIR analyzes whether there are significant impacts to environmental resources based on FAA NEPA guidance provided in FAA Order 1050.1F[6] and MEPA standards, as summarized in **Table ES-1**. Coastal resources in the footprint of the Project are shown in **Figure ES-4**. Construction would result in temporary, minor increases in noise, emissions, water quality effects (turbidity), and surface traffic. The only alternative that would avoid impacts is the No Action Alternative. However, the No Action Alternative is not acceptable because it does not meet FAA's RSA requirements.

4 An EMAS is a bed of energy-absorbing material; in an emergency, if an aircraft rolls onto the EMAS, it is slowed down in a way that minimizes damage to the aircraft and potential injuries. An EMAS is often used when a full-dimension RSA is not possible due to lack of available land or to minimize environmental impacts; an EMAS provides an FAA-approved level of safety equivalent to an RSA built to the full-length dimensions.

5 Piles are circular or square elements made from precast concrete that are driven into the ground using vibration or impact (pile driving). Caissons, which are circular columns typically larger than piles, involve drilling a hole into the bedrock into which structural steel is placed and concrete pumped to form a column.

6 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, Exhibit 4-1, "Significance Determination for FAA Actions," pages 4-4 to 4-13, July 16, 2015.





326 20-Inch Square Concrete Piles

The pile configuration includes:

- 326 total piles (294 vertical piles and 32 batter piles)
- 20-inch square concrete piles driven to rock in 10 bents[1] of 31 piles each
- Bents spaced 50 feet apart and piles within each bent spaced 11 feet apart

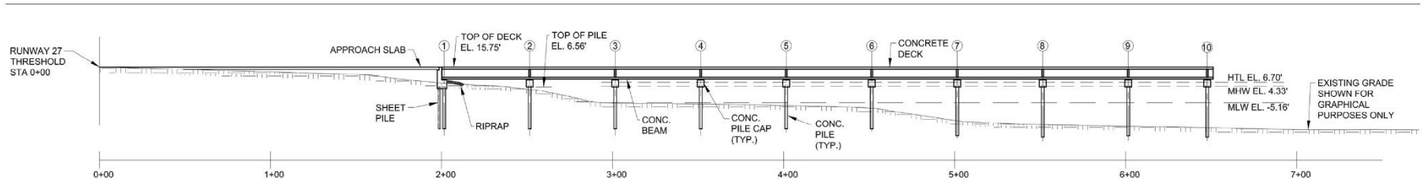


FIGURE ES-3: RSA Deck Support Alternative 2 **Runway 27 End RSA Improvements Project**

Proposed Grading Limits
Proposed Pile-Supported Deck
Proposed Engineered Materials Arresting System (EMAS) Bed
Proposed Pavement
Proposed Piles
Proposed Approach Slab
Proposed Emergency Ramp
Coastal Beach
Land Under Ocean
Land Subject to Tidal Action
Federal Emergency Management Agency (FEMA) 100-Year Flood Level
Land Containing Shellfish

1 A bent is an array of piles in a row and fastened together at the top by a pile cap.

\\hhbgbl\proj\Wat-EV\14792.00 WSP - MPA Runway 9-27\Reports\DEIR-EA\Drafts\Figures

Figure ES-4 Coastal Resources Located within the Project Site

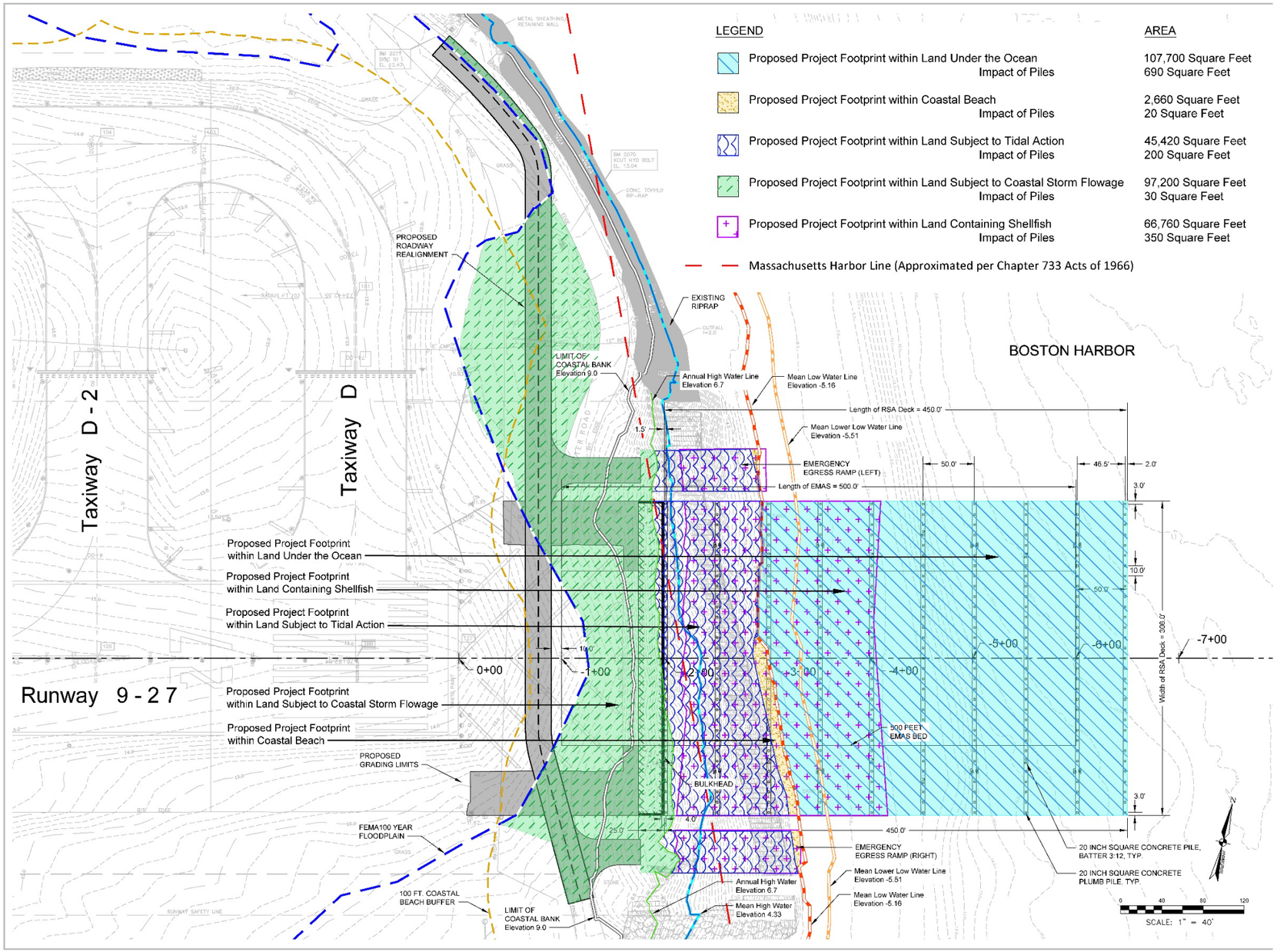


Table ES-1 Summary of Potential Impacts

Impact Category	Significant Impact?
Air Quality	**No**. No change proposed to aircraft operations, type of aircraft, or location in which aircraft operate. Temporary increases in air pollutants during construction would be below the *de minimis* standards.
Biological Resources (Including Fish, Wildlife, and Plants	**No**. No adverse impacts to federally listed threatened or endangered species under U.S. Fished and Wildlife Service (USFWS) jurisdiction (terrestrial species) are anticipated. Consultation with National Oceanic and Atmospheric Administration (NOAA) Fisheries is ongoing (marine species). The pilings would offer new hard substrate for encrusting marine animals and algae, providing feeding habitat for fish. A portion of the Project is in priority upland habitat for two grassland bird species: the upland sandpiper (*Bartramia longicauda*) [State endangered] and Eastern meadowlark (*Sturnella magna*) [State special concern]. Approximately 20,300 square feet of grassland habitat would be permanently impacted by the Project. An additional 22,000 square feet of grassland would be temporarily altered during construction. Massport will work with the Natural Heritage and Endangered Species Program (NHESP) to identify suitable locations where existing pavement can be removed to create new grassland habitat to offset Project impacts. Temporarily altered grassland will be restored in place.
Climate Change and Greenhouse Gas (GHG) Emissions	**No**. No increase in climate risk to nearby properties is anticipated. The Project would not change Airport operations or surface transportation patterns. The Runway Safety Area (RSA) deck would be designed to withstand anticipated coastal storms and sea level rise to the extent possible. Other than temporarily during construction, the Project would not increase GHG emissions.
Coastal Resources	**No**. The proposed RSA deck will overshadow approximately 3.2 acres of intertidal and subtidal habitat. The elevated deck will allow the free flow of tidal waters under the deck, preserving the intertidal and benthic habitat The RSA deck pilings would alter approximately 880 square feet of Land Subject to Tidal Action and Land Under the Ocean, including Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish. An additional 9,460 square feet of coastal resources previously disturbed by the RSA would be altered to construct the two emergency egress ramps. No changes are anticipated in wave direction or velocity, nor increases in erosion or deposition in the marine environment. Minor scour effects in the vicinity of each piling are anticipated.
Department of Transportation Act, Section 4(f)	**No**. No resources present.
Farmlands	**No**. No resources present.
Hazardous Materials and Solid Waste	**No**. No adverse impacts anticipated. No sites within the Study Area are listed on the U.S. Environmental Protection Agency's (USEPA) National Priorities List (NPL) or in the Massachusetts Department of Environmental Protection's (MassDEP) online database.
Historical, Architectural, Archaeological, and Cultural	**No**. No construction period or permanent impacts to historical/cultural resources are anticipated. No identified above ground or archaeological resources (including marine) in the area of potential effect.
Land Use	**No**. The Project would not result in changes to existing land uses on- or off-Airport at any point during construction or operation. No permanent impacts to noise sensitive land uses are anticipated.
Natural Resources and Energy Supply	**No**. No permanent impacts to natural resources and energy supply anticipated, nor significant impacts resulting from construction activities.
Noise	**No**. The Project consists of safety enhancements and would not extend the length of Runway 9-27 or affect normal runway operations, runway capacity, runway use, or the types of aircraft using the runway. Construction noise is anticipated for 120 days total during two separate 60-day periods over two years. Noise levels are not anticipated to exceed the City of Boston's construction noise limit criteria.

Impact Category	Significant Impact?
Socioeconomics, Environmental Justice (EJ), and Children's Health and Safety Risks	**No.** EJ populations would not be disproportionately affected by this safety project. The Project is a safety improvement and does not include permanent changes in employment or economics. It would not relocate houses or businesses, disrupt local traffic patterns, or reduce the community tax base. Construction would have a positive economic and jobs impact. The Project would not create or make more readily available products or substances that could harm children.
Light Emissions and Visual Impact	**No**. No new airfield or runway-related navigational light sources are proposed. Lighting installed on the RSA deck, along with lighting on a relocated security zone buoy, is anticipated to be minor given the existing urban setting and distance to residences across Boston Harbor. The RSA deck is not anticipated to significantly affect area viewsheds. The view of the shoreline from the closest residences is not anticipated to be substantially different given the low elevation of the proposed deck and in context of the surrounding Airport environment and urban setting.
Wetlands	**No**. Mitigation measures for impacts to wetlands are proposed. Massport proposes a wetland mitigation goal of 1:1 restoration or replacement of 1,200 square feet of filled wetland area (piles and emergency egress ramps) via construction or restoration of mudflat based on U.S. Army Corps of Engineers (USACE) and MassDEP guidance. The proposed RSA deck would overshadow coastal wetlands, but they will continue to provide functional value.
Floodplains	**No**. The Project would alter approximately 97,200 square feet of coastal floodplain. Work will generally maintain the existing ground elevation and not significantly reduce available floodplain volume. Any filling of coastal floodplain will not impact future base flood elevations.
Surface Waters	**No**. Turbidity may be generated during installation of piles and could temporarily affect water quality in a localized area adjacent to the Project. A turbidity curtain would be deployed around the immediate work area to contain sediment resuspended during pile-driving activities.
Groundwater	**No**. The Project is not anticipated to result in a higher pollutant load nor in an increase of total suspended solids.
Wild and Scenic Rivers	**No**. No resources present.

Source: U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, Exhibit 4-1, "Significance Determination for FAA Actions," pages 4-4 to 4-13, July 16, 2015; U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, *1050.1F Desk Reference*, Version 2, February 2020.

ES.6 Mitigation Measures

Measures to mitigate potential impacts associated with the Project are summarized in **Table ES-2**. Construction mitigation measures would be incorporated into contract documents and specifications. Construction activities would comply with FAA Advisory Circular 150/5370-10H*, Standard Specifications for Construction of Airports*.[7] On-site resident engineers and inspectors would monitor construction activities to ensure mitigation measures are implemented.

7 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports*, December 2018.

Table ES-2 Proposed Mitigation Measures and Commitments

Environmental Category	Mitigation Measure	Implementation Schedule
Land Containing Shellfish	Provide mitigation fee to Massachusetts Division of Marine Fisheries (DMF) for off-site restoration.	Prior to Construction
Habitat	Replace lost upland grass habitat, where possible.	During Construction
	Implement winter flounder time-of-year (TOY) restriction from February 1 to June 30 for in-water construction activities.	During Construction
Coastal Wetlands	Provide in-lieu fee (U.S. Army Corps of Engineers [USACE]) for impacts to mud flat.	Prior to Construction
	Provide 1:1 replacement/restoration of intertidal and subtidal wetlands impacted by piles and egress ramps. In close coordination with the resource agencies, mud flat mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End Runway Safety Area (RSA) project at Rumney Marsh in Saugus, Massachusetts.	During Construction
Water Quality	Develop and implement a comprehensive Soil Erosion and Sediment Control Plan in accordance with National Pollutant Discharge Elimination System (NPDES) and MassDEP standards.	During Construction
	Apply water to dry soil to prevent fugitive dust.	During Construction
	Stabilize highly erosive soils with erosion control blankets or by using other methods.	During Construction
	Use sediment control methods (such as silt fences and hay bales) to prevent silt and sediment entering the stormwater system and waterways.	During Construction
	Maintain equipment to prevent oil and fuel leaks.	During Construction
	Use turbidity curtains around in-water construction activities.	During Construction
	Provide measures for stormwater management and runoff treatment.	During Construction
Noise	Maintain mufflers on construction equipment in accordance with Occupational Safety and Health Administration (OSHA) standards.	During Construction
	Minimize engine idling in accordance with Massachusetts anti-idling regulations.	During Construction
	Fit air-powered equipment with pneumatic exhaust silencers.	During Construction
	Minimize nighttime construction.	During Construction
	Minimize noise during pile driving activities where possible.	During Construction
Transportation	Limit construction traffic to federal or state highways or Logan Airport roadways, prohibiting use of East Boston roadways by construction vehicles.	During Construction
	Implement construction worker vehicle trip management techniques.	During Construction
Air Quality and Greenhouse Gas (GHG) Emissions	Minimize truck idling in accordance with Massachusetts anti-idling regulations.	During Construction
	Retrofit appropriate diesel construction equipment with diesel oxidation catalysts and/or particulate filters.	During Construction
	Implement construction worker vehicle trip management techniques.	During Construction
Hazardous Materials and Solid Waste	Pre-characterize any materials before disposal (if any) to determine course of action for removal.	During Construction

ES.7 Permits and Approvals

The Proposed Project would require various local, state, and federal environmental permits prior to construction. Full review of the Project by regulatory and resource agencies, and the public would occur during the permitting process. The shoreline within the Project footprint consists of Land Subject to Tidal Action and Land Under the Ocean and is subject to regulation pursuant to several state regulatory programs. Boston Harbor is a Navigable Water of the U.S. and placement of a structure or filling within Boston Harbor is subject to federal regulation pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. **Table ES-3** summarizes the anticipated permits and approvals.

Table ES-3 Anticipated Project Permits and Approvals

Agency/Department	Permit/Approval/Action
Federal	
Federal Aviation Administration (FAA)	■ National Environmental Policy Act (NEPA)
U.S Army Corps of Engineers (USACE)	■ Section 10 of the Rivers and Harbors Act ■ Section 404 of the Clean Water Act
National Oceanic and Atmospheric Administration (NOAA) Fisheries Service	■ Section 7 Endangered Species Consultation
U.S Coast Guard (USCG)	■ Navigation Coordination
U.S. Environmental Protection Agency (USEPA)	■ National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP)
Commonwealth of Massachusetts	
Executive Office of Energy and Environmental Affairs (EEA)	■ Massachusetts Environmental Policy (MEPA) Review ■ Public Benefit Determination
Massachusetts Office of Coastal Zone Management (CZM)	■ Consistency Statement with Massachusetts Coastal Zone Management Plan
Massachusetts Department of Environmental Protection (MassDEP)	■ Individual Section 401 Water Quality Certification ■ Chapter 91 Waterways Program License Modification
Massachusetts Natural Heritage and Endangered Species Program (NHESP)	■ Conservation and Management Permit (if required)
City of Boston	
Boston Conservation Commission (BCC)	■ Massachusetts Wetlands Protection Act (WPA) Order of Conditions

Note: This is a preliminary list of local, state, and federal permits and approvals that may be sought for the Project. This list is based on current information about the Project and is subject to change as the design of the Project evolves.

RE
Resumen Ejecutivo

RE.1 Introducción

La autoridad portuaria de Massachusetts (Massport) propone mejorar el área de seguridad de la pista (RSA) en el extremo de la pista 27 del aeropuerto internacional Logan de Boston (aeropuerto Logan o el aeropuerto), adyacente al puerto de Boston (consulte la **Figura RE-1**). El proyecto propuesto de mejoras en el RSA del extremo de la pista 27 (el proyecto o el proyecto propuesto) se debe llevar a cabo para cumplir con los criterios de diseño del RSA establecidos en la Circular Consultiva (AC) 150/5300-13B *Diseño de Aeropuertos*,[1] de la Administración Federal de Aviación (FAA), y para mejorar el acceso de rescate en caso de emergencia. **Este es un proyecto de seguridad requerido por la FAA que no ampliaría la pista ni tendría efecto alguno en las operaciones habituales de la pista, la capacidad o los tipos de aeronaves que transitan por la pista.**

RE.1.1 Resumen del estado del proceso en virtud de la MEPA y la NEPA

El 31 de agosto de 2021, Massport presentó un Formulario de notificación ambiental (ENF) a la Oficina Ejecutiva de Energía y Asuntos Ambientales (EEA) de acuerdo con la Ley de Políticas Ambientales de Massachusetts (MEPA). El 30 de junio de 2022, Massport presentó un Informe preliminar de impacto ambiental (EIR) para el proyecto ante la EEA. La Secretaría de la EEA emitió un Certificado el 29 de agosto de 2022, en el que se confirma que el EIR preliminar cumplía la normativa y define el alcance de este EIR final (véase el Anexo A, *Respuesta a los comentarios del DEIR*).

El proyecto propuesto, al que se hace referencia como la "acción propuesta" según la Ley de Política Ambiental Nacional (NEPA), está sujeto a revisión en virtud de la NEPA, y la FAA estableció que el nivel procedente de revisión es una evaluación ambiental (EA). Según lo requerido por la NEPA, esta EA preliminar describe la acción propuesta y las alternativas consideradas por Massport y la FAA, documenta los posibles efectos ambientales asociados con la construcción y operación del proyecto, y en caso necesario, identifica las medidas para evitar, minimizar o mitigar los impactos.

RE.1.2 Coordinación con el público y los organismos

En coordinación con la FAA, Massport recibió, a lo largo del proyecto, comentarios de agencias reguladoras, funcionarios electos, representantes de East Boston y Winthrop, el Comité Asesor Comunitario de Massport (MCAC), el público y grupos comunitarios. En el Anexo A, *Respuesta a los comentarios del DEIR*, y en el Anexo E.5, *Plan actualizado de divulgación de la justicia ambiental*, se ofrece información adicional sobre la coordinación.

1 Departamento de Transporte de los EE. UU., Administración Federal de Aviación, Circular Consultiva 150/5300-13B, *Diseño de Aeropuertos*, 31 de marzo de 2022.

Figura RE-1 Vista aérea del aeropuerto Logan

Emplazamiento propuesto del proyecto
Límite de la propiedad del aeropuerto Logan
Jurisdicciones políticas

Proyecto de mejoras en el área de seguridad del extremo de la pista 27

0 1000 2000 4000 Pies

Fuentes: VHB 2021, ESRI, Nearmap Imagery Marzo 2022

RE.2 Descripción y propósito del proyecto

El objetivo del proyecto es mejorar la seguridad de las aeronaves y sus pasajeros en situaciones de emergencia mediante mejoras en el área de seguridad del extremo de la pista 27. El proyecto promovería un interés público primordial en la seguridad en consonancia con el título 49 de la sección 47101 del Código de los Estados Unidos, que establece "que el funcionamiento seguro del aeropuerto y de las rutas aéreas es la máxima prioridad de la aviación".[2] **Este es un proyecto de seguridad requerido por la FAA que no ampliaría la pista ni afectaría las operaciones habituales de la pista, la capacidad o los tipos de aeronaves que transitan por la pista.**

El RSA es una superficie plana que rodea la pista, libre de obstáculos. La FAA exige que los aeropuertos dispongan de RSA en los extremos y los laterales de las pistas para reducir el riesgo de lesiones y daños a las aeronaves. La pista 9-27, con 7,001 pies de longitud y 150 pies de ancho, está clasificada como una pista con código de diseño de pista D-V. Según las normas de diseño de la FAA, la pista 9-27 debe tener un RSA de 1,000 pies de largo a partir de cada extremo de la pista y 500 pies de ancho.[3] Tal como se observa en la **Figura RE-1**, el extremo de la pista 27 (extremo este de la pista 9-27) se encuentra en el extremo este del aeródromo, adyacente al puerto de Boston. El RSA del extremo de la pista 27 tiene solo 150 pies de largo y no cumple con el requisito de 1000 pies exigido por la FAA para un RSA de dimensión completa (véase la **Figura RE-2**).

Figura RE-2 Extremo de la pista 27 - Área de seguridad actual de la pista

RE.3 Alternativas analizadas

En 2017, la FAA ordenó a Massport que llevara a cabo un *Estudio de mitigación de incursiones en las pistas del aeropuerto Logan de Boston / Estudio de alternativas del área de seguridad (RSA) de la pista 9-27* para establecer las

2 Código de los Estados Unidos, título 49, subtítulo VII, parte B, capítulo 471, subcapítulo I, sección 47101 – Políticas, (a) Generalidades (1).
3 Departamento de Transporte de los EE. UU., Administración Federal de Aviación, Circular Consultiva 150/5300-13B, *Diseño de Aeropuertos*, Tabla G-11, 31 de marzo de 2022.

alternativas viables y razonables para que el RSA del extremo de la pista 27 cumpla con la normativa (véase el Anexo B. *Estudio RIM)*. Se evaluaron seis alternativas de construcción y la alternativa de acción nula en el análisis de alternativas de nivel 1. Sobre la base de los resultados, la FAA concluyó que la alternativa preferida era la 4B, que consiste en un RSA de aproximadamente 650 pies de largo con un sistema de detención de materiales de ingeniería (EMAS)[4] sobre una cubierta de 306 pies de ancho. La alternativa de acción nula también se llevó adelante para una revisión ambiental de acuerdo con los requisitos de la MEPA y la NEPA.

Se realizó una evaluación de alternativas de segundo nivel para determinar la estructura adecuada de soporte de la cubierta. Se analizaron dos tipos de estructuras: pilotes y pozos de cimentación.[5] Se evaluaron cuatro alternativas de estructuras de soporte para la cubierta. El análisis determinó que la alternativa 2 de estructura de soporte de la cubierta tendría el menor impacto en los recursos ambientales y podría construirse con el menor impacto operativo en el aeródromo. La alternativa 2 de estructura de soporte de la cubierta se presentó como la acción propuesta para un análisis más exhaustivo, junto con la alternativa de acción nula.

RE.4 Resumen de las mejoras propuestas

Como se observa en la **Figura RE-3**, Massport construiría un RSA de 650 pies de longitud con un EMAS instalado en una cubierta apoyada en pilotes (aproximadamente 450 pies de largo por 306 pies de ancho). El proyecto consistiría de lo siguiente:

- Ampliar el RSA existente del extremo de la pista 27 para instalar un muro de tablestacas de acero en el límite interior de la cubierta para evitar el asentamiento y la erosión de las zonas altas.
- Instalar una losa de transición que se extienda desde el terreno hasta la estructura apoyada en pilotes.
- Instalar una estructura de cubierta de aproximadamente 450 pies de largo y 306 pies de ancho (un área de unos 137,700 pies cuadrados [3,2 acres]), sostenida por 326 pilotes de hormigón cuadrados de veinte pulgadas.
- Instalar un EMAS de aproximadamente 500 pies de largo por 170 pies de ancho ubicado dentro de la cubierta del RSA.
- Rectificar y realinear la carretera perimetral del aeropuerto, de 20 pies de ancho, para mejorar la línea de visión vehicular y la concientización de la situación.
- Instalar dos rampas de acceso de emergencia, una a cada lado de la cubierta propuesta.
- Disponer de salvavidas en la cubierta para mejorar el acceso de entrada y salida del agua en caso de emergencia.
- Instalar barreras de protección a los lados y el extremo de la cubierta del RSA propuesta.

RE.5 Impactos ambientales

El EA preliminar / EIR final analiza si existen impactos significativos en los recursos medioambientales basándose en las directivas de la FAA respecto de la NEPA proporcionadas en la Orden 1050.1F[6] de la FAA

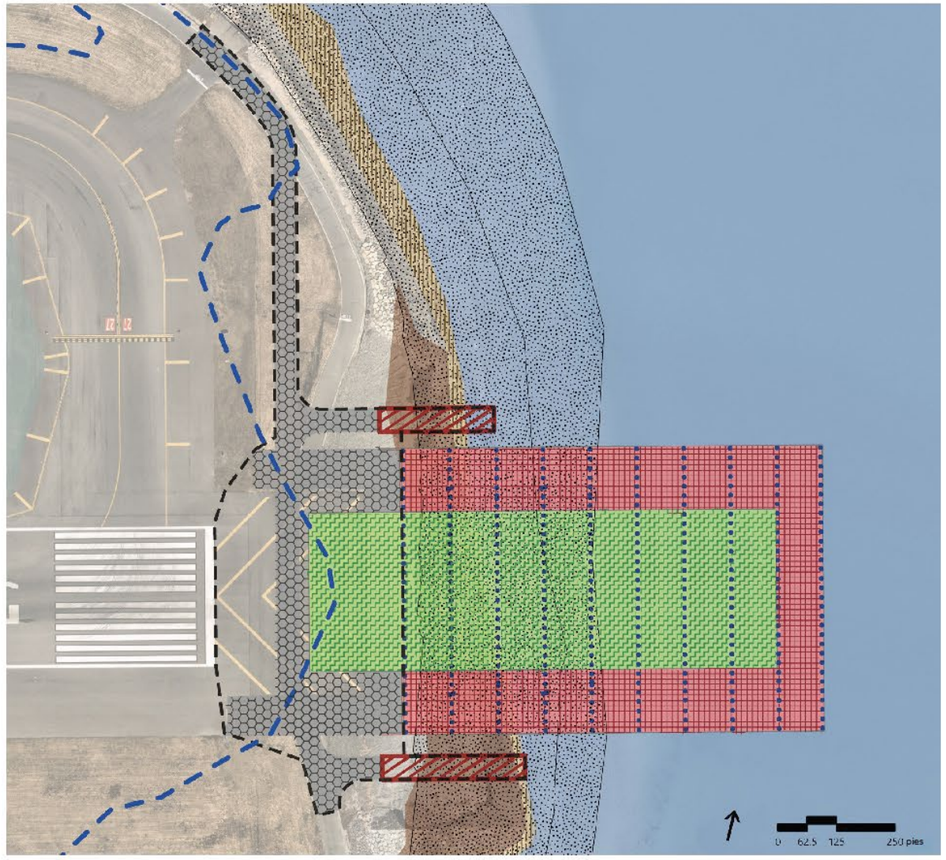
4 El EMAS es una plataforma de material que absorbe energía; en una emergencia, al avanzar sobre el EMAS, la aeronave se desacelera y así se minimizan los daños a la aeronave y posibles lesiones. El EMAS se utiliza a menudo cuando no es posible construir un RSA con las dimensiones exigidas debido a la falta de terreno disponible o para minimizar los impactos ambientales; el EMAS ofrece un nivel de seguridad aprobado por la FAA equivalente a un RSA construido con las dimensiones requeridas.

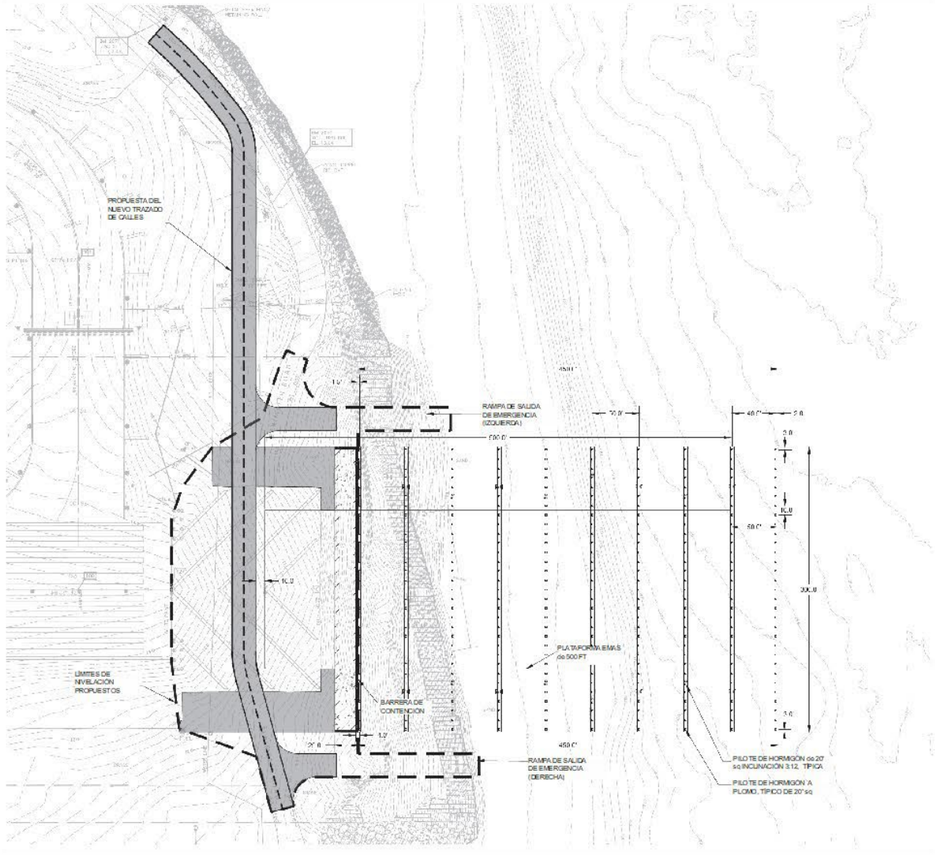
5 Los pilotes son elementos circulares o cuadrados de hormigón prefabricado que se introducen en el suelo mediante vibración o impacto (hincado). Los pozos de cimentación, que son columnas circulares generalmente más grandes que los pilotes, requieren la perforación de un agujero en el lecho de roca, donde se coloca acero estructural y se vierte hormigón para construir una columna.

6 Departamento de Transporte de los EE. UU., Administración Federal de Aviación, Orden 1050.1F: *Impactos ambientales*: *Políticas y procedimientos*, Anexo 4-1, "Determinación de importancia para las acciones de FAA", páginas 4-4 a 4-13, 16 de julio de 2015.

y en las normas de la MEPA, como se resume en la **Tabla RE-1.** Los recursos costeros ubicados en la zona de construcción del proyecto se pueden ver en la **Figura RE-4**. La construcción generaría un aumento temporario y menor del ruido, de las emisiones, de impactos en la calidad del agua (turbidez) y de tránsito en la superficie. La única alternativa que evitaría los impactos es la alternativa de acción nula. Sin embargo, esta alternativa no es viable ya que no cumple con los requisitos de la FAA respecto de la RSA.

Página Intencionalmente Dejada en Blanco.





Pilotes cuadrados de hormigón de 20 pulgadas y 326 pies

La configuración de pilotes incluye:

- Un total de 326 pilotes (294 pilotes verticales y 32 pilotes inclinados)
- Pilotes de hormigón cuadrados de 20 pulgadas hincados en la roca en 10 estructuras de soporte [1] de 31 pilotes cada una
- Estructuras de soporte ubicadas a 50 pies de distancia y pilotes en cada estructura de soporte ubicados a 11 pies de distancia

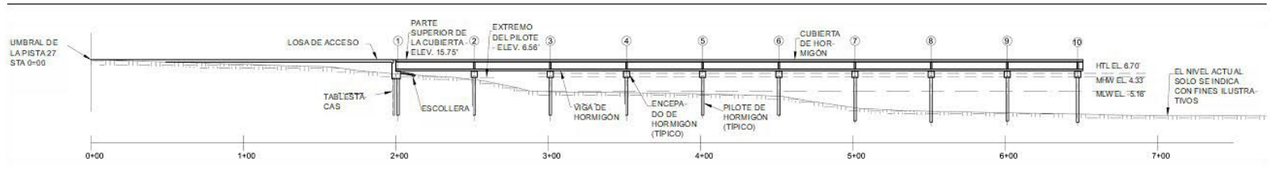


FIGURA RE-3: Alternativa 2 para el soporte de la cubierta de la RSA **Proyecto de mejoras en el área de sequridad el final de la pista 27**

- Límites de nivelación propuestos
- Cubierta apoyada en pilotes
- Plataforma propuesta con sistema mecanizado de detención de materiales (EMAS)
- Pavimento propuesto
- Pilotes propuestos
- Losa de acceso propuesta
- Rampa de emergencia propuesta
- Playa costera
- Terrenos sumergidos en el océano
- Terrenos sometidos a la acción de las mareas
- Nivel de inundación de 100 años según la Agencia Federal de Gestión de Emergencias (FEMA)
- Terrenos donde habitan crustáceos

1 Una estructura de soporte es un grupo de pilotes en hilera unidos en la parte superior por un encepado.

Figura RE-4 Recursos costeros ubicados dentro del emplazamiento del proyecto

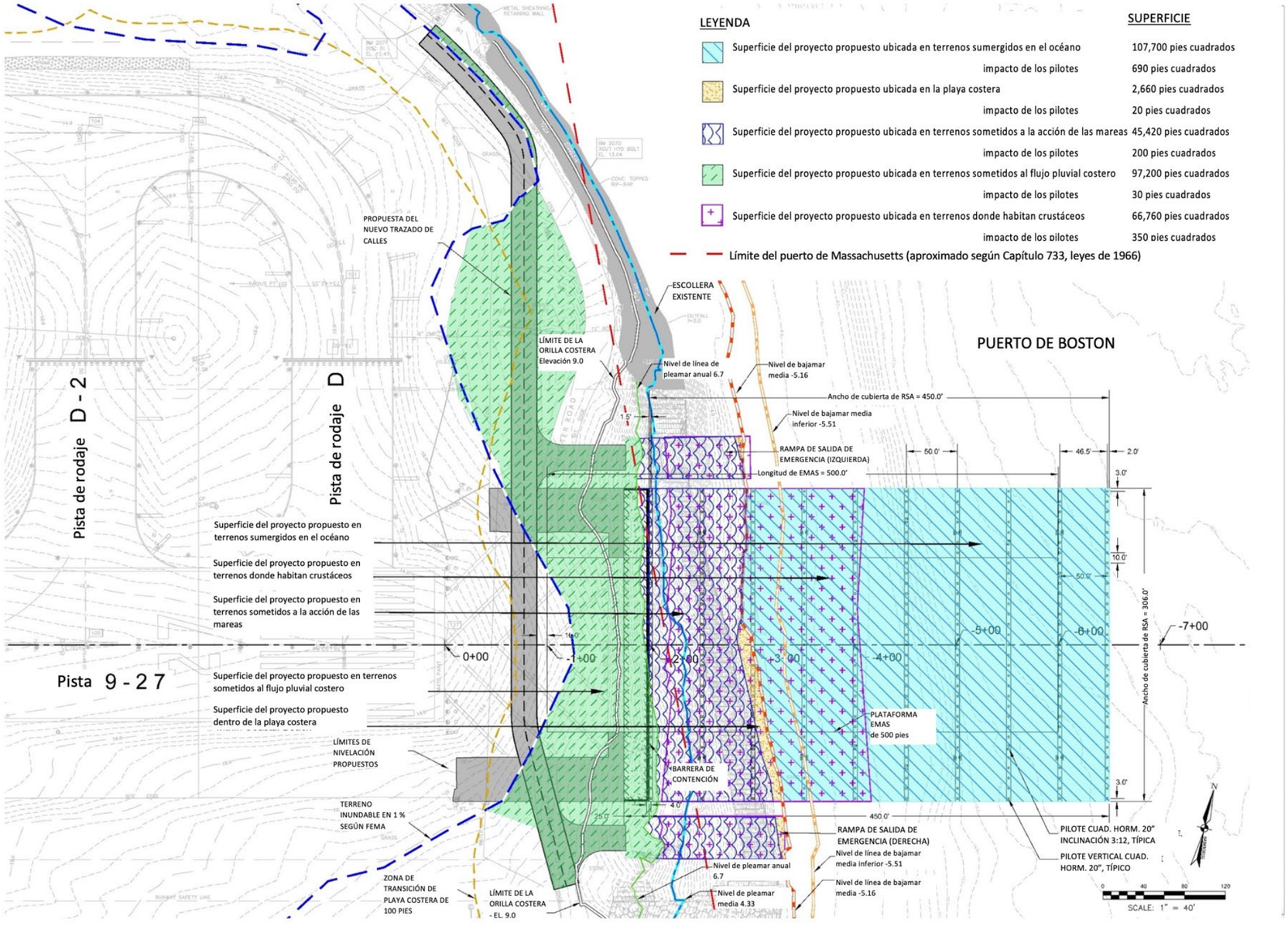


Tabla RE-1 Resumen de los posibles impactos

Categoría del impacto	¿Impacto significativo?
Calidad del aire	**No.** Ningún cambio propuesto en las operaciones de las aeronaves, en el tipo de aeronaves o en el lugar donde operan. Los aumentos temporales de contaminantes atmosféricos durante la construcción estarían por debajo de las normas de límites mínimos.
Recursos biológicos (incluidos peces, fauna y flora)	**No.** No se prevén efectos adversos para las especies amenazadas o en peligro de extinción incluidas en la lista federal bajo la jurisdicción del Servicio de Pesca y Vida Silvestre de los Estados Unidos (USFWS) (especies terrestres). La consulta con la Dirección de Pesca de la Administración Nacional Oceánica y Atmosférica (NOAA) está en curso (especies marinas). Los pilotes ofrecerían un nuevo sustrato rígido para los animales y algas marinas incrustantes, lo que proporcionaría un hábitat de alimentación para los peces. Una parte del proyecto se encuentra en un hábitat prioritario de tierras altas para dos especies de aves de pradera: el correlimos batitú (*Bartramia longicauda*) [en peligro de extinción en el estado] y el turpial oriental (*Sturnella magna*) [de preocupación especial para el estado]. Aproximadamente 20,300 pies cuadrados de hábitat de pastizales se verían afectados permanentemente por el proyecto. Otros 22,000 pies cuadrados de pastizales se verían alterados temporalmente durante la construcción. Massport trabajará con el Programa de Patrimonio Natural y Especies en Peligro (NHESP) para identificar lugares adecuados donde se pueda retirar el pavimento existente para crear un nuevo hábitat de pastizales que compense los impactos del proyecto. Los pastizales alterados temporalmente se restaurarán en su lugar.
Cambio climático y emisiones de gases de efecto invernadero (GEI)	**No.** No se prevé un aumento del riesgo climático para las propiedades cercanas. El Proyecto no modificaría las operaciones del aeropuerto ni los patrones del transporte de superficie. El diseño de la cubierta del área de seguridad de pista (RSA) resistiría las tormentas costeras y el aumento del nivel del mar previstos en la medida de lo posible. Salvo de forma temporal durante las obras de construcción, el proyecto no aumentaría las emisiones de gases de efecto invernadero.
Recursos costeros	**No.** La cubierta de RSA propuesta proyectará sombra sobre aproximadamente 3.2 acres de hábitat intermareal y submareal. La cubierta elevada permitirá el libre flujo de las aguas de mareas debajo de la cubierta, y así preservará el hábitat intermareal y bentónico. Los pilotes de la cubierta del RSA modificarían aproximadamente 880 pies cuadrados de terrenos sometidos a la acción de las mareas y de terrenos sumergidos en el océano, incluidos los márgenes costeros, playas costeras/planicies afectadas por mareas y terrenos donde habitan crustáceos. Se modificarían otros 9460 pies cuadrados de recursos costeros previamente alterados por el RSA para construir las dos rampas de salida de emergencia. No se prevén cambios en la dirección o velocidad de las olas, ni aumentos de la erosión o transporte de sedimentos en el medio marino. Se prevén impactos leves de socavación en la proximidad de cada pilote.
Ley del Departamento de Transporte, Sección 4(f)	**No.** Ningún recurso presente.
Tierras de cultivo	**No.** Ningún recurso presente.
Materiales y residuos sólidos peligrosos	**No.** No se prevén impactos adversos. Ningún lugar de la zona de estudio figura en la Lista Nacional de Prioridades (NPL) de la Agencia de Protección Ambiental de EE.UU. (USEPA) ni en la base de datos en línea del Departamento de Protección Ambiental de Massachusetts (MassDEP).
Recursos históricos, arquitectónicos, arqueológicos y culturales	**No.** No se prevé ningún período de construcción ni impacto permanente en los recursos históricos/culturales. No se han identificado recursos de superficie o arqueológicos (incluidos los marinos) en el área de impacto potencial.

Categoría del impacto	¿Impacto significativo?
Uso de la tierra	**No.** El proyecto no provocaría cambios en los usos del suelo existentes dentro o fuera del aeropuerto en ningún momento durante la construcción o el funcionamiento. No se prevén impactos permanentes en los usos del suelo sensibles al ruido.
Recursos naturales y suministro de energía	**No.** No se prevén impactos permanentes en los recursos naturales y el suministro de energía, ni impactos significativos derivados de las actividades de construcción.
Ruido	**No.** El proyecto consiste en mejoras de seguridad y no ampliaría la longitud de la pista 9-27 ni afectaría a las operaciones habituales de la pista, su capacidad, su uso o los tipos de aeronaves que transitan por ella. Se prevé que el ruido de la construcción dure 120 días en total durante dos períodos separados de 60 días a lo largo de dos años. No se prevé que los niveles de ruido superen los criterios de límites del ruido de construcción de la ciudad de Boston.
Economía social, justicia ambiental, y riesgos para la salud y la seguridad de los niños	**No.** Las comunidades de justicia ambiental no se verían desproporcionadamente afectadas por este proyecto de seguridad. El proyecto es una mejora de la seguridad y no representa cambios permanentes en el empleo o la economía. No se reubicarían viviendas ni negocios, no alteraría los patrones de tráfico local ni reduciría la base impositiva de la comunidad. Las obras tendrían un impacto económico y laboral positivo. El proyecto no crearía ni facilitaría la disponibilidad de productos o sustancias que pudieran dañar a los niños.
Emisiones lumínicas e impacto visual	**No.** No se proponen nuevas fuentes de luz de navegación relacionadas con el aeródromo o la pista. Se prevé que la iluminación instalada en la cubierta del RSA, junto con la iluminación de una boya de zona de seguridad reubicada, sea menor dado el entorno urbano existente y la distancia a las residencias al otro lado del puerto de Boston. No se prevé que la cubierta del RSA afecte significativamente las cuencas visuales de la zona. No se prevén diferencias significativas en la vista de la costa desde las residencias más cercanas dada la baja elevación de la cubierta propuesta y en el contexto del entorno del aeropuerto y el entorno urbano.
Humedales	**No.** Se proponen medidas de mitigación de los impactos en los humedales. Massport propone un objetivo de mitigación para los humedales que contempla la restauración o sustitución con un coeficiente 1:1 de 1200 pies cuadrados de zona de humedal rellenada (pilotes y rampas de salida de emergencia) mediante la construcción o restauración de marismas basándose en las pautas del Cuerpo de Ingenieros del Ejército de EE.UU. (USACE) y MassDEP. La cubierta RSA propuesta proyectará sombra sobre los humedales costeros, pero estos seguirán aportando valor funcional.
Terrenos inundables	**No.** El proyecto afectaría aproximadamente 97,200 pies cuadrados de terrenos costeros inundables En general, las obras mantendrán la elevación existente del terreno y no reducirán significativamente el volumen disponible de terrenos inundables. Cualquier relleno del terreno costero inundable no afectará los niveles futuros del 1 % de probabilidad de inundación.
Aguas superficiales	**No.** Durante la instalación de los pilotes puede generarse turbidez y podría afectar temporalmente a la calidad del agua en una zona específica contigua al proyecto. Se implementaría una barrera de turbidez alrededor de la zona inmediata de las obras para contener los sedimentos resuspendidos durante las tareas de hincado de pilotes.
Agua subterránea	**No.** No se prevé que el proyecto genere una mayor carga contaminante o un aumento del total de sólidos en suspensión.
Ríos salvajes y paisajísticos	**No.** Ningún recurso presente.

Fuente: Departamento de Transporte de los EE. UU., Administración Federal de Aviación, Orden 1050.1F: *Impactos ambientales: Políticas y procedimientos*, Anexo 4-1, "Determinación de importancia para las acciones de FAA", páginas 4-4 a 4-13, 16 de julio de 2015; Departamento de Transporte de los EE. UU., Administración Federal de Aviación, Oficina de Asuntos Ambientales y Energía, *Material de referencia de 1050.1F*, versión 2, febrero de 2020

RE.6 Medidas de mitigación

Las medidas para mitigar los posibles impactos asociados al proyecto se resumen en la **Tabla RE-2**. Las medidas de mitigación de la construcción se incorporarían a los documentos y especificaciones contractuales. Las actividades de construcción cumplirían con la Circular Consultiva 150/5370-10H de la FAA, *Especificaciones estándar para la construcción de aeropuertos.*[7] Los ingenieros e inspectores que residan en el lugar supervisarían las actividades de construcción para garantizar que se apliquen las medidas de mitigación.

Tabla RE-2 Medidas de mitigación y compromisos propuestos

Categoría ambiental	Medida de mitigación	Cronograma de implementación
Terrenos donde habitan crustáceos	Proporcionar costos de mitigación a la División de Pesca Marítima de Massachusetts (DMF) para la restauración fuera del emplazamiento.	Antes de la construcción
Hábitat	De ser posible, reemplazar el hábitat de pastizal perdido de zonas altas.	Durante las obras de construcción
	Aplicar la restricción de la época del año del lenguado de invierno para las actividades de construcción en el agua, que se extiende del 1 de febrero al 30 de junio.	Durante las obras de construcción
Humedales costeros	Establecer los costos de sustitución (Cuerpo de Ingenieros del Ejército de EE. UU. [USACE]) para los impactos en la marisma.	Antes de la construcción
	Proporcionar restauración/sustitución con un coeficiente de 1:1 de humedales intermareales y submareales afectados por los pilotes y rampas de salida. En estrecha coordinación con las agencias de recursos, se prevé que la mitigación de la marisma consista en la restauración de la costa en el puerto de Boston/Chelsea Creek, o bien, podría contemplar la creación de una marisma similar a lo que Massport llevó a cabo anteriormente para compensar los impactos asociados con el proyecto del área de seguridad del extremo de la pista 33L en la marisma Rumney Marsh en Saugus, Massachusetts.	Durante las obras de construcción
Calidad del agua	Desarrollar e implementar un plan integral de control de la erosión y los sedimentos del suelo de acuerdo con las normas del Sistema Nacional de Eliminación de Descarga de Contaminantes (NPDES) y de MassDEP.	Durante las obras de construcción
	Aplicar agua al suelo seco para evitar el polvo fugitivo.	Durante las obras de construcción
	Estabilizar suelos sumamente erosivos con mantas para el control de la erosión u otros métodos.	Durante las obras de construcción
	Utilizar métodos de control de sedimentos (como vallas de sedimentos y fardos de heno) para evitar que los sedimentos ingresen al sistema de aguas pluviales y a las vías navegables.	Durante las obras de construcción
	Realizar el mantenimiento de los equipos para evitar fugas de aceite y combustible.	Durante las obras de construcción
	Utilizar barreras de turbidez en torno de las zonas de construcción en el agua.	Durante las obras de construcción
	Proporcionar medidas para la gestión de las aguas pluviales y el tratamiento de la escorrentía.	Durante las obras de construcción

7 Ministerio de Transporte de los EE. UU., Administración Federal de Aviación, Circular Consultiva 150/5370-10H, *Especificaciones estándar para la construcción de aeropuertos*, diciembre 2018.

Categoría ambiental	Medida de mitigación	Cronograma de implementación
Ruido	Instalar silenciadores en los equipos de construcción de acuerdo con las normas de la Administración de Seguridad y Salud Ocupacional (OSHA).	Durante las obras de construcción
	Minimizar el ralentí del motor de acuerdo con las reglamentaciones de Massachusetts contra el ralentí.	Durante las obras de construcción
	Equipar los equipos neumáticos con silenciadores neumáticos de escape.	Durante las obras de construcción
	Minimizar las obras de construcción durante la noche.	Durante las obras de construcción
	En la medida de lo posible, minimizar el ruido durante las actividades de hincado de pilotes.	Durante las obras de construcción
Transporte	Limitar el transporte de la maquinaria de construcción a las carreteras federales o estatales o a las del aeropuerto Logan. Se prohíbe el uso de las calles de East Boston para el tránsito de maquinaria de construcción.	Durante las obras de construcción
	Aplicar técnicas de gestión para los desplazamientos de los trabajadores de la construcción.	Durante las obras de construcción
Calidad del agua y emisiones de gases de efecto invernadero	Minimizar el ralentí de los camiones de acuerdo con las reglamentaciones de Massachusetts contra el ralentí.	Durante las obras de construcción
	Acondicionar los equipos de construcción diésel adecuados con catalizadores de oxidación diésel o filtros de partículas.	Durante las obras de construcción
	Aplicar técnicas de gestión para los desplazamientos de los trabajadores de la construcción.	Durante las obras de construcción
Materiales y residuos sólidos peligrosos	Clasificar previamente los materiales antes de eliminarlos (si lo hubiese) para establecer las medidas correspondientes para su eliminación.	Durante las obras de construcción

RE.7 Permisos y aprobaciones

El proyecto propuesto requeriría varios permisos ambientales locales, estatales y federales antes de la construcción. Durante el proceso de concesión de permisos, se llevaría a cabo una revisión completa del proyecto por parte de los organismos reguladores y de recursos, y también por parte del público. La línea de costa dentro de la superficie del proyecto está formada por terrenos sometidos a la acción de las mareas y terrenos sumergidos en el océano, y está sujeta a reglamentaciones de acuerdo con los programas estatales reglamentarios. El puerto de Boston está ubicado en aguas navegables de los Estados Unidos, y la colocación de una estructura o un relleno en el puerto de Boston está sujeta a la reglamentación federal en virtud del artículo 10 de la Ley de Ríos y Puertos y del artículo 404 de la Ley de Aguas Limpias. La **Tabla RE-3** resume las aprobaciones y los permisos previstos.

Tabla RE-3 Permisos y aprobaciones previstos

Organismo/Departamento	Permiso/Autorización/Acción
Federal	
Administración Federal de Aviación (FAA)	■ Ley de Política Medioambiental Nacional (NEPA)

Organismo/Departamento	Permiso/Autorización/Acción
Cuerpo de Ingenieros del Ejército de los Estados Unidos (USACE)	■ Artículo 10 de la Ley de Ríos y Puertos ■ Sección 404 de la Ley de Aguas Limpias
Dirección de Pesca de la Administración Nacional Oceánica y Atmosférica (NOAA)	■ Consulta de la sección 7 sobre especies en peligro de extinción
Guardia Costera de Estados Unidos (USCG)	■ Coordinación de la navegación
Agencia de Protección Ambiental de EE. UU. (USEPA)	■ Permiso General de Construcción (CGP) del Sistema Nacional de Eliminación de Descarga Contaminantes (NPDES)
Mancomunidad de Massachusetts	
Oficina Ejecutiva de Energía y Asuntos Ambientales (EEA)	■ Revisión de la Ley de Políticas Ambientales de Massachusetts (MEPA) ■ Determinación del beneficio público
Oficina de Gestión de la Zona Costera de Massachusetts (CZM)	■ Declaración de congruencia con el plan de gestión de la zona costera de Massachusetts
Departamento de Protección Ambiental de Massachusetts (MassDEP)	■ Certificación individual de la calidad del agua según la sección 401 ■ Capítulo 91 Modificación de la licencia del programa de vías navegables
Programa de Patrimonio Natural y Especies en Peligro de Massachusetts (NHESP)	■ Permiso de conservación y gestión (si fuese necesario)
Ciudad de Boston	
Comisión de Conservación de Boston (BCC)	■ Orden de condiciones de la Ley de Protección de los Humedales (WPA) de Massachusetts

Nota: Esta es una lista preliminar de los permisos y autorizaciones locales, estatales y federales que pueden solicitarse para el Proyecto. Esta lista se basa en la información actual sobre el proyecto y está sujeta a modificaciones a medida que avance el diseño del proyecto.

Página Intencionalmente Dejada en Blanco.

1 Purpose and Need for the Proposed Action

1.1 Introduction

The Massachusetts Port Authority (Massport) is proposing to improve the Runway Safety Area (RSA) at the end of Runway 27 at Boston Logan International Airport (Logan Airport or the Airport), as shown in **Figure 1-1**. The Runway 27 End RSA Improvements Project (the Project or the Proposed Project) is required, to the extent feasible, to be consistent with Federal Aviation Administration (FAA) airport design standards for RSAs and to enhance rescue access in the event of an emergency.[1] **This Project is a required FAA safety project that would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway**.

To minimize environmental impacts to Boston Harbor while enhancing safety, Massport proposes to improve the Runway 27 End RSA by installing an Engineered Materials Arresting System (EMAS) on an approximately 450-foot-long by 306-foot-wide pile-supported deck. An EMAS is a safety system constructed of collapsible concrete blocks with predictable deceleration forces. When, in an emergency, an aircraft rolls into an EMAS, the tires of the aircraft collapse the lightweight concrete, and the aircraft is slowed down in a way that minimizes damage to the aircraft.

As discussed in more detail in Section 1.3, this document is the Final Environmental Impact Report (Final EIR) prepared in accordance with the requirements of the Massachusetts Environmental Policy Act (MEPA). This document also serves as the Draft Environmental Assessment (Draft EA) prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA). In the interest of meeting the page limits for an EA required by NEPA, while also complying with the content requirements of MEPA and NEPA, this Draft EA/Final EIR summarizes and incorporates by reference the Draft Environmental Impact Report (DEIR) for the Proposed Project.[2]

1 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, Airport Design, March 31, 2022.
2 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

FIGURE 1-1: Logan Airport Aerial **Runway 27 End RSA Improvements Project**

Proposed Project Site
Logan Airport Property Line
Political Jurisdictions

0 1000 2000 4000 Feet

Sources: VHB 2021, ESRI, Nearmap Imagery March 2022

1.2 Background

FAA requires airports to provide a safety area surrounding each runway to reduce the risk of damage to aircraft and increase protection of passengers in the event of an unintentional "excursion" from the runway. An "excursion" from the runway can include an overrun (an arriving aircraft fails to stop before the end of the runway), an undershoot (an aircraft arriving on a runway touches down before the start of the paved runway surface), or a veer-off to one side of a runway.

As detailed in FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*, to the extent practicable, FAA requires airports that receive federal funding for airport improvement projects to provide standard dimension RSAs that are well-drained, capable of supporting maintenance and snow removal equipment, and are clear of potentially hazardous grade changes and objects. A standard dimension RSA for Runway End 27 would be 1,000-feet-long by 500-feet-wide. However, an EMAS, which provides a level of safety equivalent to a full dimension RSA, is an acceptable alternative where it is not practicable to obtain the standard RSA dimensions due to lack of available land or, to minimize environmental impacts; both are true at the end of Runway 27. EMAS is an energy-absorbing material that crushes under the weight of an aircraft and surrounds the landing gear, stopping the aircraft, as shown in **Figure 1-2**. The runway's aircraft fleet mix determines the required length of the EMAS.

Figure 1-2 Aircraft Gear in Engineered Materials Arresting System (EMAS)-(Photo Credit: SKYbrary, 2020)

1.3 Federal and State Agency Roles and Approvals

This section discussed status of federal (NEPA) and state (MEPA) reviews, permits, and other approvals required for the Project.

1.3.1 NEPA Review Status

The Proposed Project, which is referred to as the "Proposed Action" in NEPA, requires FAA's approval of a change to the Airport Layout Plan to depict the proposed improvements and FAA determinations relating to the Project's eligibility for federal funding. These actions are subject to review under NEPA, and FAA has determined that an EA is the appropriate level of review. As required by the NEPA regulations, this Draft EA describes the Proposed Action and alternatives considered by Massport and FAA, documents the potential environmental effects associated with the construction and operation of the proposal, and where necessary, identifies measures to avoid, minimize or mitigate impacts. This document was prepared in accordance with NEPA, the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA specified in Title 40 Code of Federal Regulations (CFR)

Parts 1500-1508,[3] FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*,[4] and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*,[5] along with guidance provided in FAA's *1050.1F Desk Reference*.[6]

1.3.2 MEPA Review Status

Pursuant to MEPA Regulations (301 Code of Massachusetts Regulations [CMR] 11.00), Massport filed an Environmental Notification Form (ENF) with the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) on August 31, 2021. The ENF was circulated to interested parties and a Public Notice of Environmental Review was published on September 2, 2021. A virtual public consultation session was held on September 22, 2021, to receive comments on the Project. The EEA Secretary issued a Certificate on the ENF on October 8, 2021, confirming the need to prepare an EIR and outlining the DEIR scope elements.

On June 30, 2022, Massport filed a DEIR for the Project with EEA. A Public Notice of Environmental Review was published in the Environmental Monitor on July 8, 2022, and the DEIR was circulated to those who commented on the ENF and other interested parties. The public comment period on the DEIR ended on August 22, 2022. The Secretary of EEA issued a Certificate on the DEIR on August 29, 2022, confirming that the DEIR complied with the MEPA regulations and outlining the scope of the Final EIR. The Secretary's DEIR Certificate can be found in Appendix A, *DEIR Certificate and Response to Comments*.

This Draft EA/Final EIR was prepared in accordance with the scope outlined in the DEIR Certificate. There have been no changes to the Project since the DEIR.

1.3.3 Other Permits and Approvals

In addition to compliance with NEPA and MEPA, several federal, state, and local permits and other environmental approvals are needed for the Proposed Project. Review of the Project associated with these permits and approvals by regulatory agencies and the public would occur during the permitting process. **Table 1-1** lists the anticipated permits and approvals.

3 Council on Environmental Quality, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy*, Title 40 Code of Federal Regulations Parts 1500-1508, May 20, 2022.
4 U.S. Department of Transportation, Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 28, 2006.
5 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, July 16, 2015.
6 U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, *1050.1F Desk Reference*, Version 2, February 2020.

Table 1-1 Anticipated Project Permits and Approvals

Agency/Department	Permit/Approval/Action
Federal	
Federal Aviation Administration (FAA)	■ National Environmental Policy Act (NEPA) Review
U.S Army Corps of Engineers (USACE)	■ Section 10 of the Rivers and Harbors Act ■ Section 404 of the Clean Water Act
National Oceanic and Atmospheric Administration (NOAA) Fisheries Service	■ Section 7 Endangered Species Consultation
U.S. Coast Guard (USCG)	■ Navigation Coordination
U.S. Environmental Protection Agency (USEPA)	■ National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP)
Commonwealth of Massachusetts	
Executive Office of Energy and Environmental Affairs (EEA)	■ Massachusetts Environmental Policy Act (MEPA) Review ■ Public Benefit Determination
Massachusetts Office of Coastal Zone Management (CZM)	■ Consistency Statement with Massachusetts Coastal Zone Management Plan
Massachusetts Department of Environmental Protection (MassDEP)	■ Individual Section 401 Water Quality Certification ■ Chapter 91 Waterways Program License Modification
Massachusetts Natural Heritage and Endangered Species Program (NHESP)	■ Conservation and Management Permit (if required)
City of Boston	
Boston Conservation Commission (BCC)	■ Massachusetts Wetlands Protection Act (WPA) Order of Conditions

Note: This is a preliminary list of federal, state, and local permits and approvals that may be sought for the Project. This list is based on current information about the Project and is subject to change as the design of the Project evolves.

1.4 Purpose and Need

1.4.1 Purpose

The purpose of the Project is to enhance safety for aircraft and their passengers in emergency situations by providing an RSA at the end of Runway 27 that is consistent with current FAA requirements.

1.4.2 Need for the Project

Logan Airport, certificated under 14 CFR Part 139, is a commercial service and general aviation airport that receives federal funding for airport improvement projects, and is therefore federally obligated by FAA Order 5200.8[7] to meet the RSA design criteria contained in FAA AC 150/5300-13B, *Airport Design,* to the extent practicable.[8]

In 2017, FAA notified Massport that Runway 27 did not meet RSA standards. In response, Massport

7 U.S. Department of Transportation, Federal Aviation Administration, Order 5200.8, Runway Safety Area Program, October 1, 1999.
8 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, Airport Design, March 31, 2022.

embarked on a study and in 2019, Massport published the *Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study* (the RIM Study).[9] The RIM Study identified options for improving Runway 9-27 RSAs, specifically the Runway 27 End closest to Boston Harbor (see **Figure 1-3**). The RIM Study was attached to FAA's Determination on the acceptable improvements for the Runway 27 End RSA (both documents are included in Appendix B, *RIM Study*).[10]

Figure 1-3 Runway 27 End – Existing Runway Safety Area

Runway 9-27 is 7,001 feet in length and 150 feet wide, with 75-foot-wide paved shoulders on each side of the runway. On the west end of the runway (the Runway 9 End), the RSA meets the full dimension RSA standards. While the inclined safety area (ISA) constructed in 1992 at the Runway 27 End (east end of runway) enhanced safety, the ISA pre-dates current technologies and research conducted by FAA and the National Transportation Safety Board on runway safety improvements, the formation of FAA's Runway Safety Area Program, and the adoption by FAA of current RSA standards. With the ISA in place, the Runway 27 End meets the RSA required dimensions for width (500 feet) but does not meet the current RSA length requirements of 1,000-foot overrun or 600-foot undershoot protection required by FAA per AC 150/5300-13B (see Section 2.3 of the DEIR for more information)[11]. Therefore, physical improvements to the Runway 27 End RSA are needed to further enhance the safety of passengers and aircraft during takeoff and landing.

Improving the Runway 27 End RSA would fulfill the overriding public interest to optimize safety. Improvements to the RSA would enhance safety through reducing the potential for injury to passengers,

9 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, Runway Safety Area Determination, Appendix B: RSA Determination Form, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

10 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, Appendix E, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

11 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, Chapter 2, Project Purpose and Need, pages 2-3 to 2-6, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

aircraft crew, airport employees, and damage to the environment by reducing the risk of an aircraft entering Boston Harbor.

1.5 Public Involvement

In coordination with FAA, Massport has thus far obtained public input throughout the scoping, planning, and analysis of the Project. In the spirit of what was at the time the pending new MEPA requirements for projects within 1 mile of an Environmental Justice (EJ) community, Massport voluntarily held a virtual pre-ENF filing public meeting on June 29, 2021, after reaching out to local and state elected officials, representatives in East Boston and Winthrop, the Massport Community Advisory Committee (MCAC), and community interest groups. Notice of the meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. The meeting was attended by representatives from State Representative Adrian Madaro's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens. Translation services were provided in Spanish.

On August 31, 2021, Massport filed an ENF with EEA, in accordance with MEPA and its implementing regulations specified in 301 CMR 11.00. The ENF was circulated to interested parties in accordance with 301 CMR 11.16(2) and a Public Notice of Environmental Review was published on September 2, 2021. A virtual public consultation session on the ENF was held on September 22, 2021, to receive comments on the Project, and for MEPA's and FAA's use in determining the scope for a state EIR and the NEPA review document. Notice of this meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. Translation services were provided in Spanish. The Secretary of EEA issued a Certificate on the ENF on October 8, 2021, confirming the need to prepare an EIR and describing the DEIR scope elements.

After public notice of the filing of the DEIR on July 8, 2022, a 30-day public comment period followed; the end of the comment period was voluntarily extended by Massport from August 8 to August 22, 2022. An additional virtual public meeting was conducted on July 20, 2022, and was attended by representatives from State Senator Ed Markey's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens. Notice of this meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. The DEIR was made publicly available on Massport's website,[12] at the public libraries listed in the DEIR, and printed copies were available upon request. On August 10, 2022, Massport participated in a special meeting on the Project of the Massport Community Advisory Committee, with representatives from the City of Boston and the Town of Winthrop. The Secretary of EEA issued a Certificate on the DEIR on August 29, 2022, describing scope elements for the Final EIR which will be combined with the Draft EA.

Ahead of the Draft EA/Final EIR filing, Massport announced the imminent filing on its social media pages as well as with a Notice of Availability, in English and Spanish, that will be published after the filing in the *East Boston Times*, *Winthrop Transcript*, and *El Mundo*. The Draft EA/Final EIR was electronically circulated to the EJ reference list provided by MEPA in accordance with the *MEPA Public*

12 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Involvement Protocol for Environmental Justice Populations (see Appendix G, *Distribution List*). All parties on the distribution list have been sent a link to an electronic copy of the Draft EA/Final EIR. The Draft EA/Final EIR was published on the Massport website (https://www.massport.com/logan-airport/about-logan/environmental-reports/) and made available at several public libraries. Included with the Draft EA/Final EIR are Spanish versions of the Notice of Availability and Executive Summary.

Massport worked with FAA and the MEPA Office to develop a concurrent MEPA and NEPA review for the Draft EA/Final EIR. A 30-day public comment period commences on December 23, 2022, coincident with the publication of the MEPA *Environmental Monitor*, and concludes on January 23, 2023. This coordinated review also serves as the federal public NEPA review, including for FAA's Draft Finding of No Significant Impact (FONSI), which is included as Appendix D of this Draft EA/Final EIR.

2

Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action would extend the length of the existing Runway 27 End Runway Safety Area (RSA) at Boston Logan International Airport (Logan Airport or the Airport) from 150 feet to a maximum of 650 feet and would incorporate an Engineered Materials Arresting System (EMAS). Use of the EMAS would enhance safety while maintaining the existing operational capability of the runway and airfield and minimizing environmental impacts to Boston Harbor (**Figure 2-1**). Based on the adjacent Runway 33L End RSA improvements completed in 2012, it is estimated that the EMAS atop the proposed RSA deck at the Runway 27 End would be approximately 500 feet in length and approximately 170 feet in width, with final dimensions to be determined later in design by the EMAS manufacturer. The RSA would be at grade for approximately 200 feet immediately east of the Runway 27 End, then extend further east on a deck into Boston Harbor. The deck would be approximately 450 feet long and 306 feet wide (approximately 137,000 square feet or 3.2 acres) to accommodate the EMAS, as well as access for emergency vehicles around the EMAS bed.

The Proposed Action would consist of the improvements listed in **Table 2-1** and shown in **Figure 2-1**. The deck would be supported by 326 twenty-inch square pre-cast concrete piles arranged in a grid pattern. In one direction of the grid, the piles would be fastened together at the top by pile-caps or bracing and the connected rows are referred to as "bents." As shown in **Figure 2-1**, the Project includes the realignment and straightening of the existing 20-foot-wide airport perimeter road on the north side of the Runway 27 End to enhance vehicular sight lines and situational awareness for vehicles crossing the runway end, while remaining clear of the proposed EMAS. Two 25-foot-wide emergency egress ramps would also be constructed on either side of the proposed RSA deck, as shown on **Figure 2-1**.

Table 2-1 Proposed Runway 27 End RSA Improvements

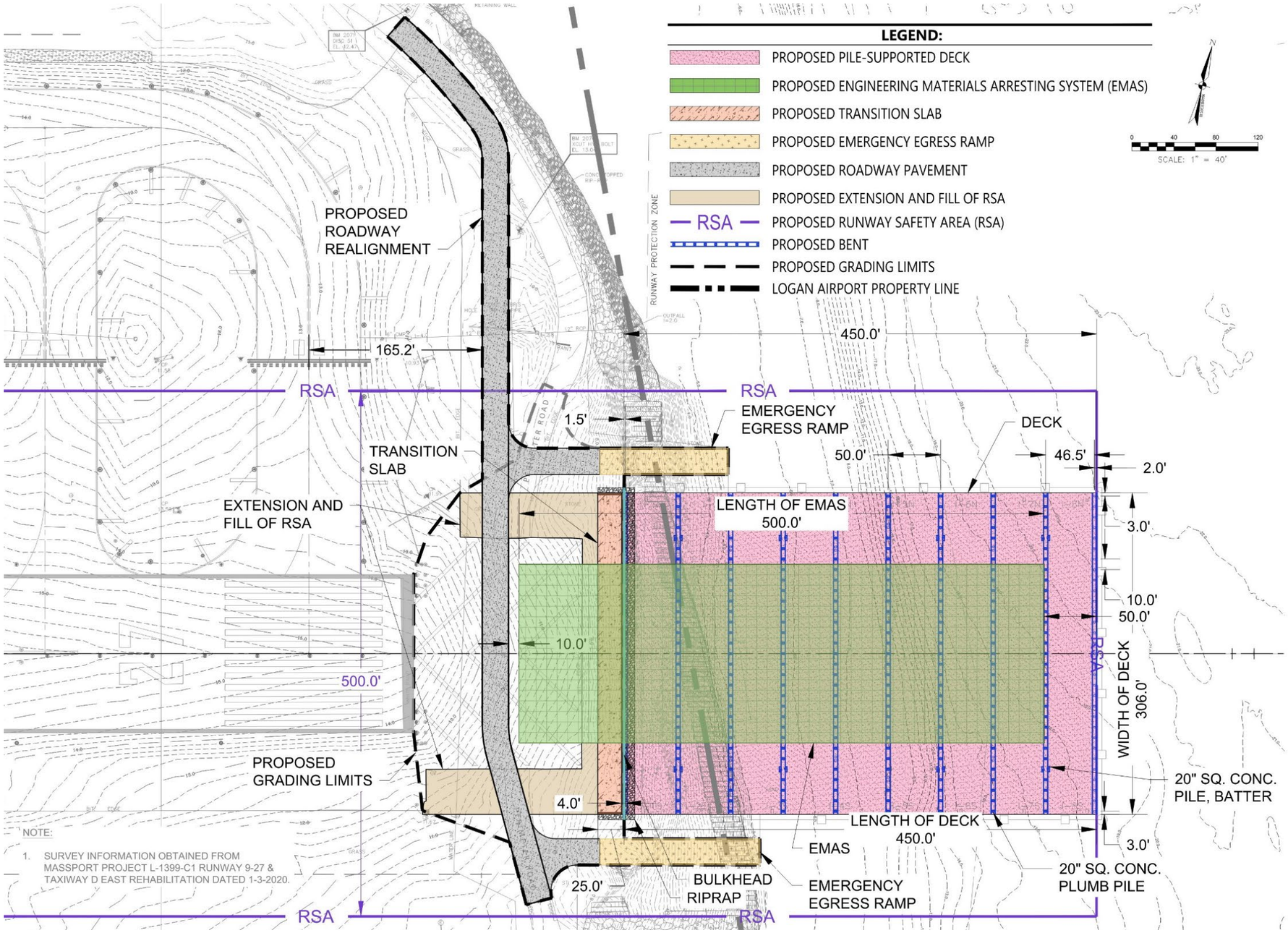
Proposed Improvements
A pile-supported deck structure approximately 450 feet long and 306 feet wide, with an area of approximately 137,700 square feet (3.2 acres), elevated above the harbor surface
Extension from 150 feet to 200 feet of the approximately 306-foot-wide center portion of the existing Runway 27 End Runway Safety Area (RSA) to accommodate a transition slab from the pavement to the deck
An approximately 350-foot-long wall (bulkhead) at the inshore limit of the deck and within the current Inclined Safety Area (ISA) footprint, to prevent settlement and erosion of the upland areas
A transition slab approximately 306 feet wide along the shoreline and 25 feet long, spanning from the land to the pile-supported deck
A supporting structure for the deck comprised of 326 twenty-inch square concrete piles driven to rock (294 vertical piles and 32 batter piles[1]) in a 10 bent arrangement spaced 50 feet apart with cast-in-place (CIP) pile-caps, precast girders, and a CIP 15-inch deck slab that sits above the surface of the water
An Engineered Materials Arresting System (EMAS) approximately 500 feet long by 170 feet wide located within the RSA
Relocation of the existing 20-foot-wide airport perimeter road to a location between the Runway 27 threshold and the EMAS
Straightening of the perimeter road on the north side of Runway 27 to enhance vehicular sight lines and situational awareness crossing the runway end, while remaining clear of the EMAS
Two 25-foot-wide emergency access ramps, located on either side of the proposed deck
Life rings on the sides and end of the deck to enhance access in and out of the water in the event of an aircraft emergency
Safety railings along the sides and end of the proposed RSA deck

1 Batter piles are bracing piles driven at an angle to the vertical to provide resistance to horizontal forces.

2.2 No Action Alternative

Both the Massachusetts Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA) require the Proposed Action be compared to a No Action Alternative (**Figure 2-2**). The No Action Alternative assumes that no improvements would be made to the RSA at the Runway 27 End and the existing RSA would remain 500 feet wide and 150 feet long. The RSA for the Runway 27 End does not meet Federal Aviation Administration's (FAA) standard RSA length of 1,000 feet for a full dimension RSA nor provide an equivalent level of safety with an EMAS, and thus, the existing RSA deficiency at the Runway 27 End would remain unresolved. The No Action Alternative would not affect airfield utility and efficiency, or the perimeter road. It would avoid environmental impacts and impacts to the navigation channel. Although the No Action Alternative does not impact the environment, this alternative does not address the primary safety purpose and need of the Project. A No Action Alternative is used as the baseline against which to evaluate the environmental impacts of the alternatives carried forward for analysis. Therefore, per the requirements of MEPA and NEPA, the No Action Alternative is retained for comparative purposes only.

Figure 2-1 Conceptual Design of Runway 27 End Runway Safety Area Improvements



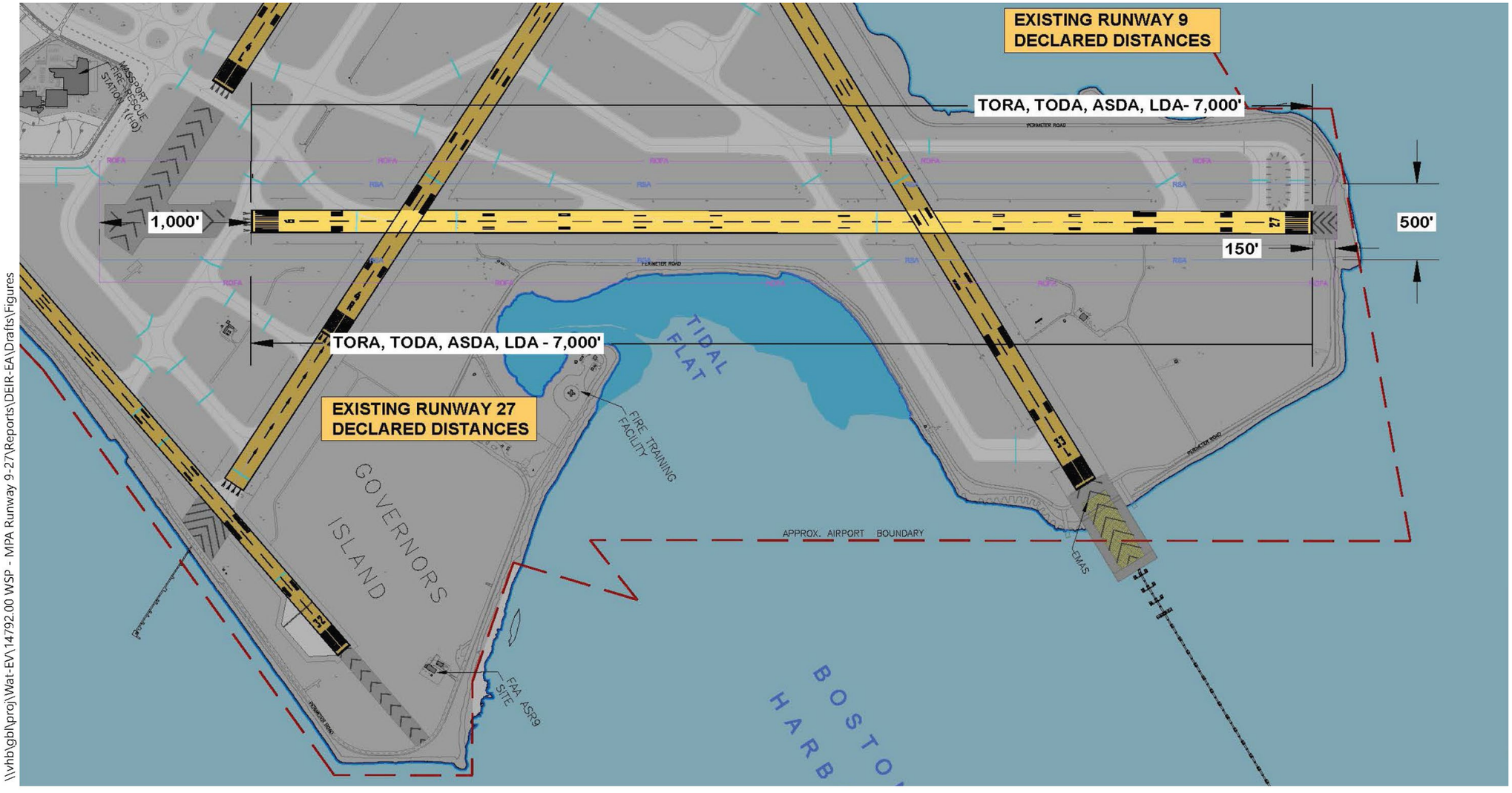


Figure 2-2: No Action Alternative (Existing Conditions)

Runway 27 End RSA Improvements Project

- Runway Pavement
- High Energy Runway Area
- Taxiway/Apron Pavement
- Building
- Water
- Instrument Landing System (ILS) Holdbar
- Holdbar
- Potential Displaced Threshold
- Potential Pavement Painting
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- TORA Takeoff Run Available
- TODA Takeoff Distance Available
- ASDA Accelerate-Stop Distance Available
- LDA Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

2.3 Alternatives Considered but Eliminated from Further Consideration

FAA and Massport conducted a two-step process to identify reasonable alternatives for enhancing the existing RSA at the Runway 27 End. The first step of the analysis, summarized below in Section 2.3.1, examined six alternatives for enhancing the RSA at the Runway 27 End, as well as the No Action Alternative. This analysis is detailed in the *Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study* (the RIM Study)[1], which is available in Appendix B. The analysis concluded the only reasonable alternative for enhancing the RSA at the end of Runway 27 consistent with FAA's requirements is an approximately 650-foot-long RSA with an EMAS on a 306-foot-wide deck extending into Boston Harbor. This alternative, named RSA Alternative 4B, would provide the highest level of aircraft safety without reducing the operational capability of the runway, while also minimizing environmental impacts in Boston Harbor. FAA's 2019 RSA Determination (included in Appendix B) directed Massport to construct an improved RSA with EMAS on a deck, as described in Alternative 4B, but did not specify the type of deck support structure to be constructed, nor the size of the EMAS.[2] See the RIM Study (Appendix B) and Section 3.2 of the Draft Environmental Impact Report (DEIR) for more detail on the Tier 1 screening. [3]

The second step of the analysis considered structural options for supporting the deck. This analysis is detailed in Section 3.3 of the DEIR.[4] The analysis found that, compared to the other alternatives considered, Deck Support Alternative 2, which would be constructed on 326 twenty-inch square piles and could be constructed in 120 days, would have the least impact on environmental resources and could be constructed with the least operational impacts to the airfield. Thus, RSA Alternative 4B, constructed on Deck Support Alternative 2, was carried forward as the Proposed Action for further analysis in the DEIR and is the Proposed Project evaluated in this Draft Environmental Assessment (EA)/Final EIR.

2.3.1 Summary of Tier 1 RSA Alternatives Screening

This section summarizes the six RSA alternatives for enhancing the Runway 27 End RSA that were considered by FAA and Massport in the 2019 RIM Study, as well as the screening criteria applied in Tier 1, and the justification for elimination or progression of each RSA alternative to Tier 2. The RSA alternatives are shown in **Figure 2-3** through **Figure 2-8**. The alternatives include:

- Alternative 1 – Declared Distances
- Alternative 2 – Displaced Threshold Markings
- Alternative 3A – Full RSA in Boston Harbor – Fill Option
- Alternative 3B – Full RSA in Boston Harbor – Deck Option
- Alternative 4A – EMAS on 500-Foot-Wide Deck
- Alternative 4B – EMAS on 306-Foot-Wide Deck

1 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, Runway Safety Area Determination, Appendix B, RSA Determination Form, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.
2 The final length of the proposed RSA deck and support structure, and the size of the EMAS, will be determined during deck final design.
3 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 3, pages 3-5 to 3-19, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.
4 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 3, pages 3-19 to 3-27, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Table 2-2 lists the criteria applied to screen the RSA alternatives and summarizes the results. For more detail on the criteria and results of the screening, see DEIR Section 3.2 and Appendix B, *RIM Study*.

Table 2-2 Tier 1 Alternatives Screening Results

	Alternative						
Screening Criteria	**1 Declared Distances[1]**	**2 Displaced Thresholds**	**3A Full RSA, Fill**	**3B Full RSA, Deck**	**4A EMAS on 500' Deck**	**4B EMAS on 306' Deck**	**No-Build**
Provide overrun and undershoot protection for aircraft consistent with FAA design criteria	🟢	🔴	🟢	🟢	🟢	🟢	🔴
Preserve airfield utility and efficiency	🔴	🟢	🟢	🟢	🟢	🟢	🟢
Retain perimeter road	🟢	🟢	🟢	🟢	🟢	🟢	🟢
Avoid triggering runway injunction requirements	🟢	🔴	🟢	🟢	🟢	🟢	🟢
Avoid impacts to the navigation channel	🟢	🟢	🔴	🔴	🔴	🟢	🟢
Avoid and minimize environmental impacts	🟢	🟢	🔴	🔴	🔴	🟠	🟢

Key:
🟢 Green indicates the criterion is met and/or no negative effect is anticipated; the alternative is favorable in comparison to the other alternatives.
🟠 Orange indicates the criterion is partially met and/or there is some negative effect anticipated.
🔴 Red indicates the criterion is not met and/or a negative effect is anticipated; the alternative is not favorable in comparison to the other alternatives.

1 Although RSA Alternative 1 scored positively against several of the screening criteria, it would adversely affect airfield operations and pose significant takeoff limitations.

Source: U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B, *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

2.3.1.1 Screening Criteria

The following summarizes the screening criteria used to identify the Proposed Action.

- **Provide overrun and undershoot protection for aircraft consistent with FAA design criteria**. The alternative must achieve the purpose and need for the Project: it must provide protection if an aircraft arriving (or aborting a departure) on Runway 9 fails to stop before the Runway 27 threshold (overrun) or if an aircraft arriving on Runway 27 lands short of the runway threshold (undershoot). The level of protection provided must be consistent with FAA design criteria for a full dimension RSA of 1,000 feet long for an overrun and 600 feet long for an undershoot or provide the equivalent with an EMAS bed.
- **Preserve airfield utility and efficiency**. The alternative must maintain the utility and operational efficiency of the airfield. This includes the ability of Runway 9-27 to accommodate Runway Design Code D-V aircraft.[5] In 2012, the FAA declared "[T]he FAA does not require an airport operator to reduce the length of the runway or declare its length to be less than the actual pavement length to meet runway safety area standards if there is an operational impact to the airport. An example of an adverse operational impact would be an airport's inability to accommodate its current or planned aircraft fleet."

5 Per FAA Advisory Circular 150/5300-15B, *Airport Design*, Runway Design Code is a three-component code relating Aircraft Approach Category, Airplane Design Group, and approach visibility minimums. Each runway has a specific Runway Design Code establishing design criteria such as runway to taxiway separations, safety areas, Object Free Areas, and Obstacle Free Zones. These standards allow optimal safe operations by the critical aircraft.

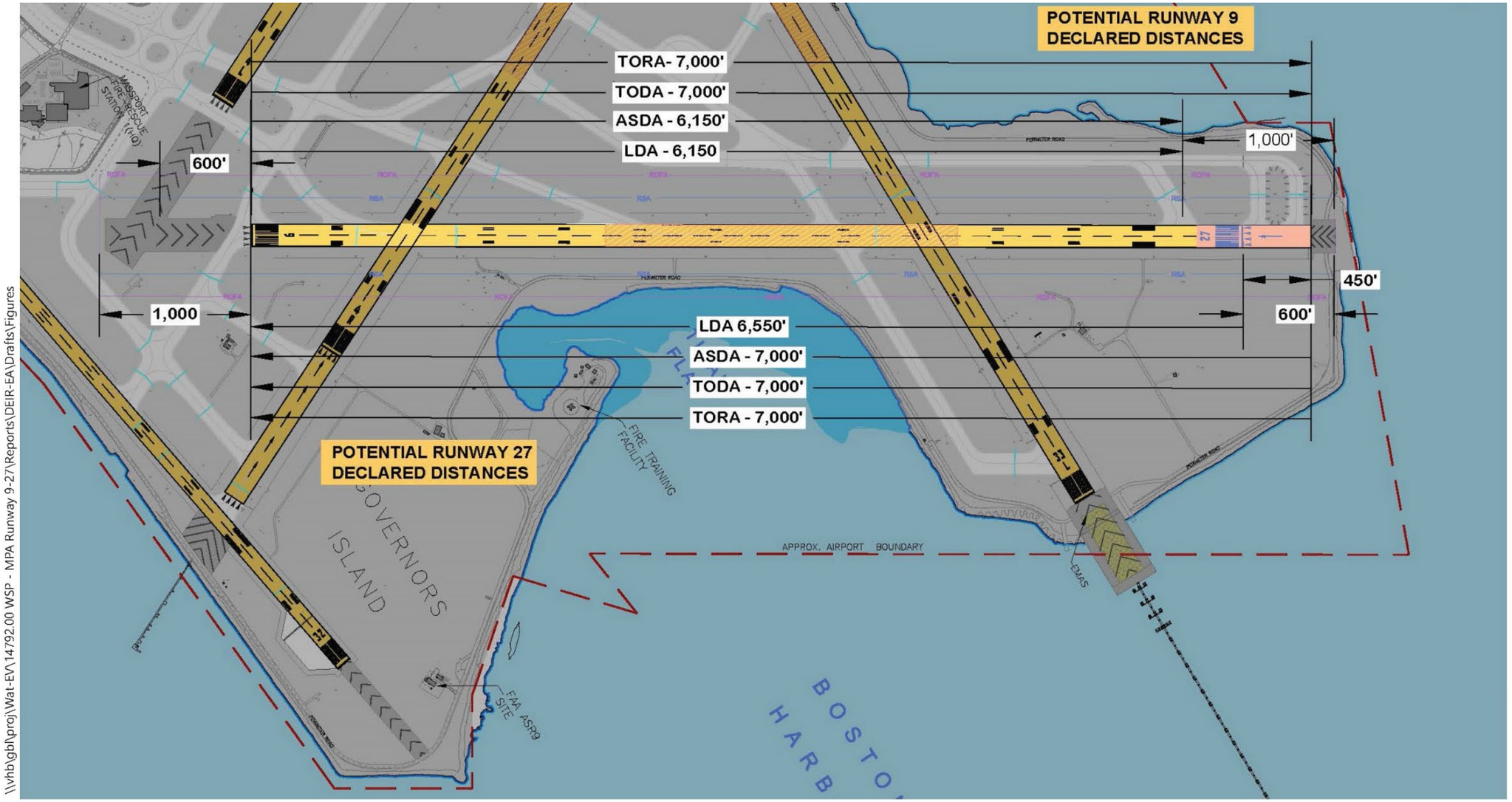


Figure 2-3: Alternative 1—Declared Distances

Runway 27 End RSA Improvements Project

Runway Pavement	Instrument Landing System (ILS) Holdbar	Runway Object Free Area (ROFA)	
High Energy Runway Area	Holdbar	TORA	Takeoff Run Available
Taxiway/Apron Pavement	Potential Displaced Threshold	TODA	Takeoff Distance Available
Building	Potential Pavement Painting	ASDA	Accelerate-Stop Distance Available
Water	Runway Safety Area (RSA)	LDA	Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

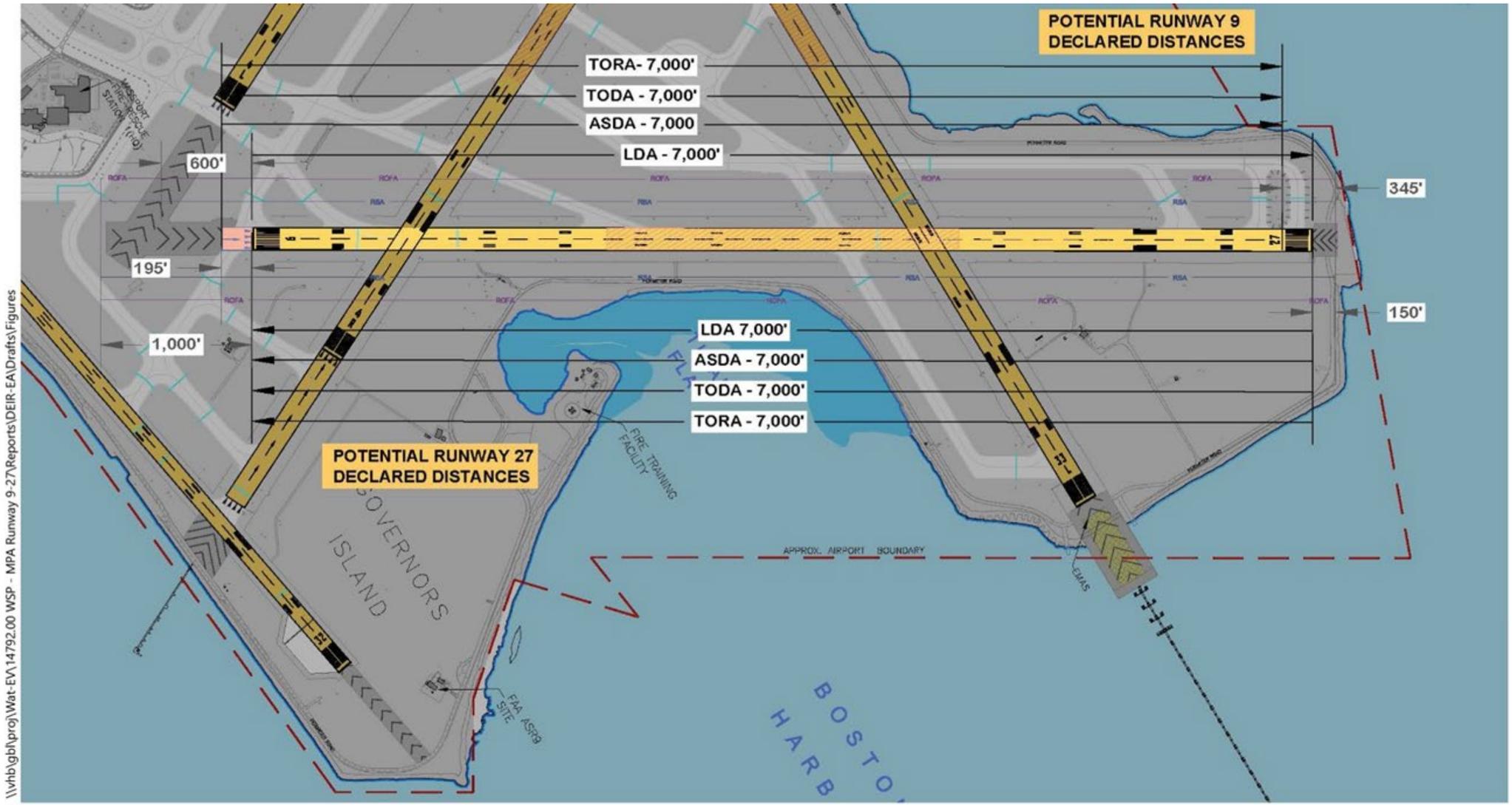


Figure 2-4: Alternative 2—Displaced Threshold Markings **Runway 27 End RSA Improvements Project**

- Runway Pavement
- High Energy Runway Area
- Taxiway/Apron Pavement
- Building
- Water
- Instrument Landing System (ILS) Holdbar
- Holdbar
- Potential Displaced Threshold
- Potential Pavement Painting
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- TORA Takeoff Run Available
- TODA Takeoff Distance Available
- ASDA Accelerate-Stop Distance Available
- LDA Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

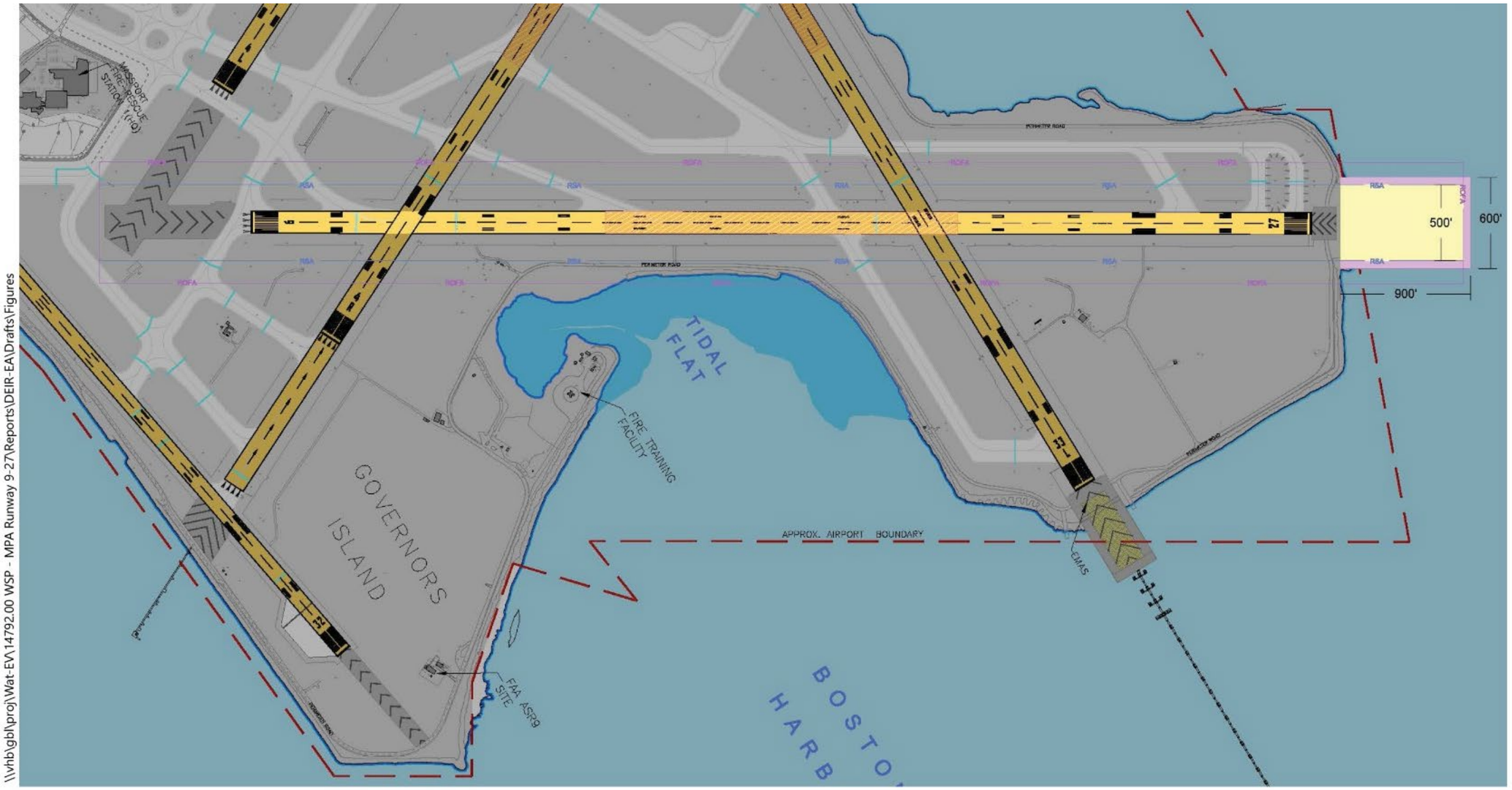


Figure 2-5: Alternative 3A—Full RSA in Boston Harbor, Fill Option

Runway 27 End RSA Improvements Project

Runway Pavement	Instrument Landing System (ILS) Holdbar	Runway Object Free Area (ROFA)	
High Energy Runway Area	Holdbar	TORA	Takeoff Run Available
Taxiway/Apron Pavement	Potential Displaced Threshold	TODA	Takeoff Distance Available
Building	Potential Pavement Painting	ASDA	Accelerate-Stop Distance Available
Water	Runway Safety Area (RSA)	LDA	Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

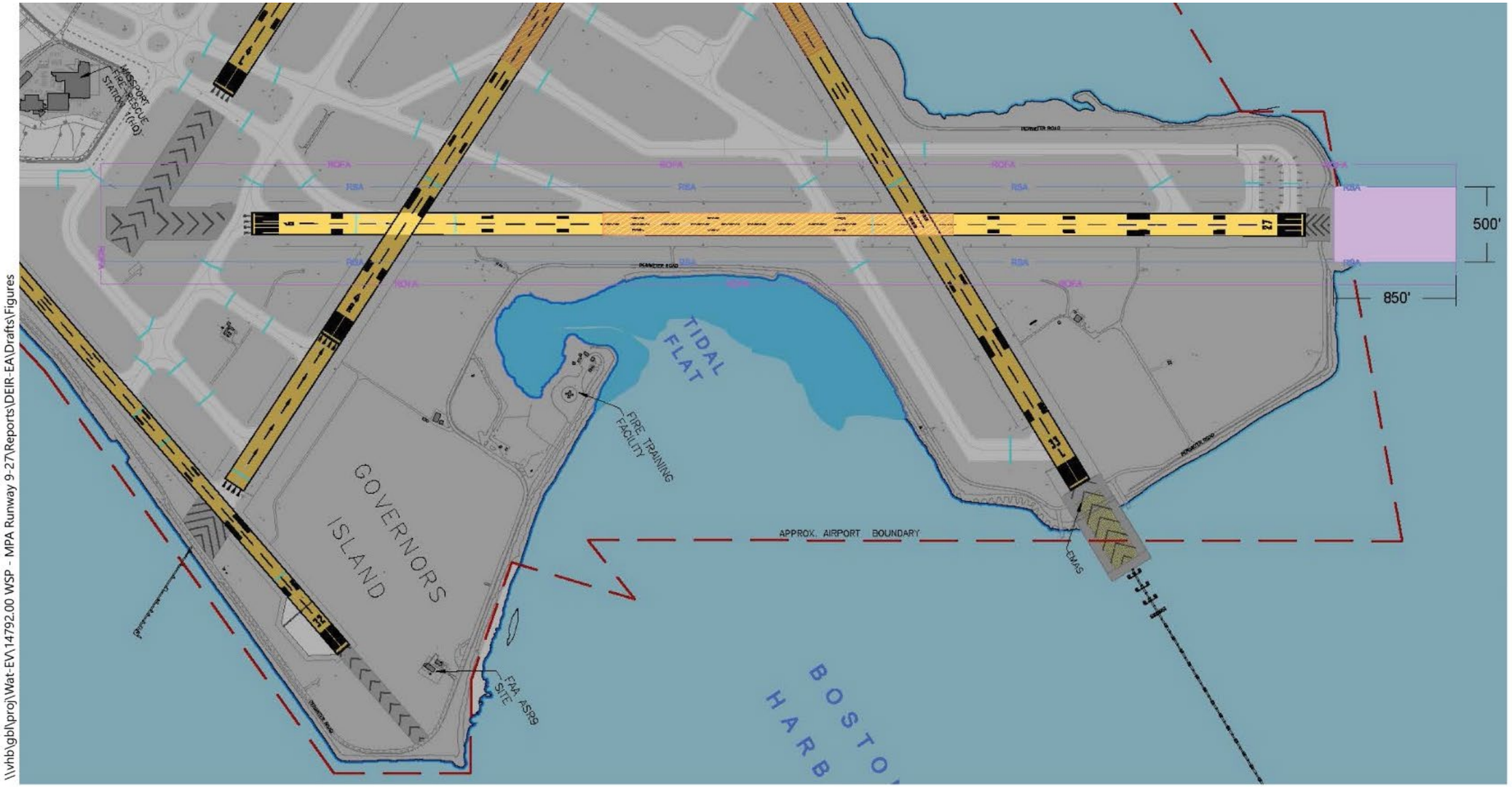


Figure 2-6: Alternative 3B—Full RSA in Boston Harbor, Deck Option **Runway 27 End RSA Improvements Project**

- Runway Pavement
- High Energy Runway Area
- Taxiway/Apron Pavement
- Building
- Water
- Instrument Landing System (ILS) Holdbar
- Holdbar
- Potential Displaced Threshold
- Potential Pavement Painting
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- TORA Takeoff Run Available
- TODA Takeoff Distance Available
- ASDA Accelerate-Stop Distance Available
- LDA Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

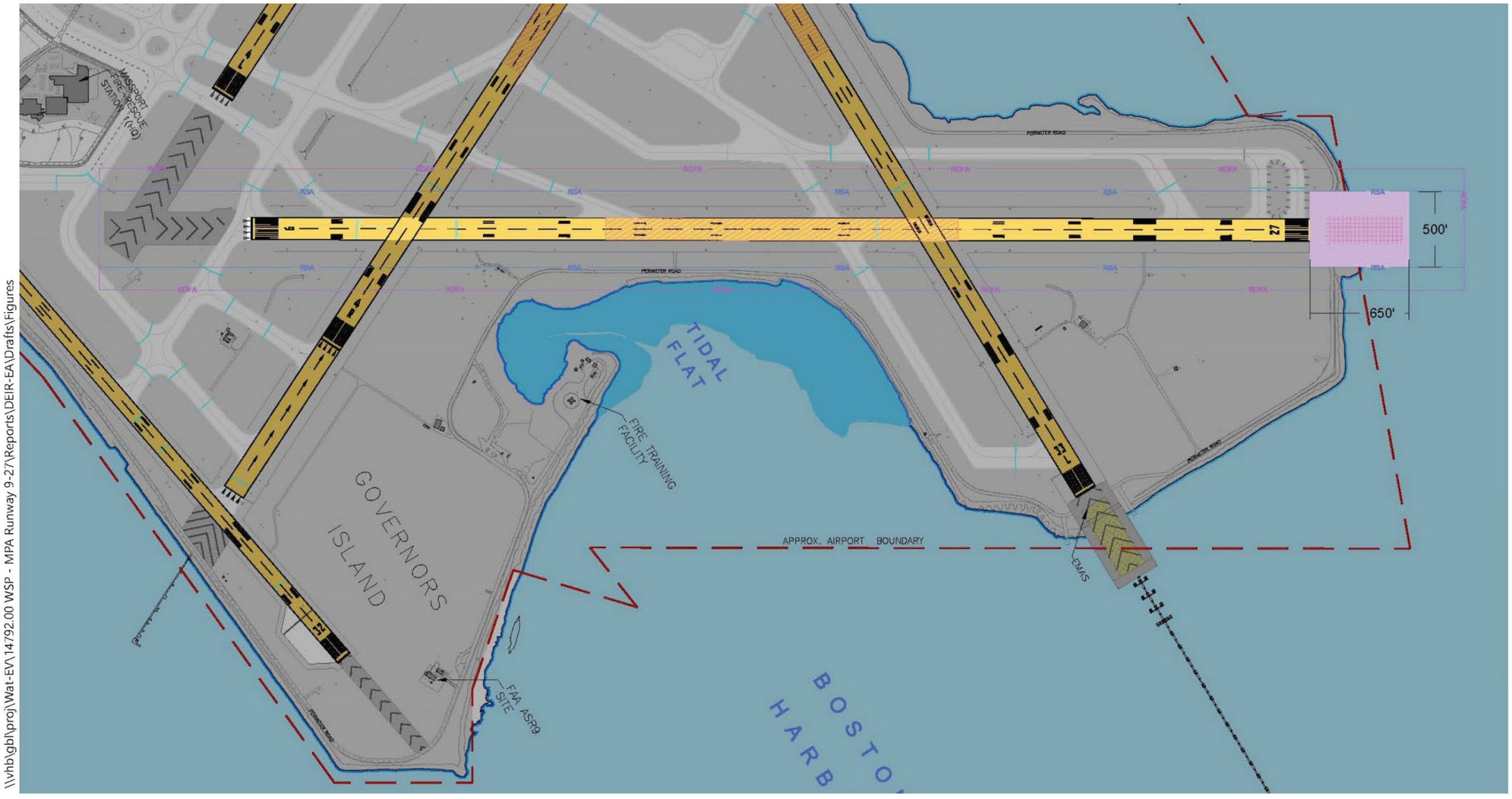


Figure 2-7: Alternative 4A—EMAS on 500-Foot-Wide Deck

Runway 27 End RSA Improvements Project

- Runway Pavement
- High Energy Runway Area
- Taxiway/Apron Pavement
- Building
- Water
- Instrument Landing System (ILS) Holdbar
- Holdbar
- Potential Displaced Threshold
- Potential Pavement Painting
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- TORA Takeoff Run Available
- TODA Takeoff Distance Available
- ASDA Accelerate-Stop Distance Available
- LDA Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

Figure 2-8: Alternative 4B—EMAS on 306-Foot-Wide Deck *(Proposed Action)* **Runway 27 End RSA Improvements Project**

- Runway Pavement
- High Energy Runway Area
- Taxiway/Apron Pavement
- Building
- Water
- Instrument Landing System (ILS) Holdbar
- Holdbar
- Potential Displaced Threshold
- Potential Pavement Painting
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- TORA Takeoff Run Available
- TODA Takeoff Distance Available
- ASDA Accelerate-Stop Distance Available
- LDA Landing Distance Available

0 400 800 1600 Feet

Source: Massachusetts Port Authority, "Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study," January 8, 2019.

- **Retain perimeter road**. The selected alternative must retain or relocate the existing perimeter road. The perimeter road provides a vital link to key locations around the airfield and is necessary for Airport operations and emergency access.
- **Adhere to runway injunction requirements**. Over the years, local courts have issued Logan Airport-specific injunctions that prohibit moving the runway threshold locations of Runways 4L, 22R and 9; accordingly, the selected alternative must be consistent with these injunctions. The processing of lifting or modifying the existing injunctions would require community involvement, court review, potential further litigation, additional environmental review processes, and the approval of the FAA; the outcome of all these processes is not guaranteed and would take several years.
- **Avoid major impacts to the navigation channel in Winthrop**. The navigation channel east of Runway 27 is narrow. The U.S. Army Corps of Engineers (USACE) regulates impacts to navigation channels under the Rivers and Harbors Act and it is unlikely the USACE would issue a permit for any major impact to the channel; thus, the alternative must avoid major impacts to the channel. Coordination with the U.S. Coast Guard is in progress.
- **Avoid and minimize environmental impacts**. The alternatives should avoid and minimize environmental impacts where possible, for example, by selecting another alternative that meets the FAA design standards, and results in fewer environmental impacts.

2.3.1.2 RSA Alternative 1 – Declared Distances

Declared distances are established primarily by changing the pavement markings on the runway. The Runway 27 landing threshold would be moved by 450 feet to the west to accommodate a full dimension RSA (**Figure 2-3**). As described in the RIM Study (included in Appendix B, *RIM Study*), the runway landing distance available (LDA) for aircraft arriving on Runway 27 would be reduced by 450 feet and would be reduced for aircraft arriving on Runway 9 by 850 feet. Additionally, the Accelerate-Stop Distance Available (ASDA) for aircraft departing on Runway 9 would be reduced by 850 feet. The reduction of ASDA is anticipated to require certain aircraft to reduce their takeoff weight to comply with maximum operating takeoff weight requirements by reducing the number of passengers, the cargo on-board, and/or the aircraft's fuel load. A more likely scenario is that pilots would request the use of alternative runways, thus severely impacting Airport efficiency as well as shifting associated noise to other runways. In addition, shifting the Runway 27 threshold west by 450 feet would reduce the available distance between the Runway 27 threshold and the exit to Taxiway E. Aircraft unable to slow down sufficiently to exit at Taxiway E would need to cross Runway 4R-22L to exit at Taxiway K or M, resulting in increased runway occupancy time, decreased arrival capacity on Runway 27, and potential operational impacts to Runway 22L departure capacity.

Runway 9 is the primary jet departure runway during northeast wind configuration. Reduction in ASDA could lead airlines to request Runway 4R for departures instead of Runway 9. This could create major disruption in operations, including delays and increase the potential of runway incursions as Runway 4R is the primary arrival runway during the northeast configuration.

Table 2-3 lists the Airplane Design Group (ADG) III aircraft (e.g., Boeing 737 and Airbus A321), which comprise approximately 74 percent of Runway 9 departures, that would be impacted by the displaced threshold and the associated reduction in ASDA (refer to Appendix B, *RIM Study*). ADG IV and V

aircraft, which make up approximately 6 percent of Runway 9 departures, would be similarly impacted. Virtually all ADG III, IV, and V aircraft departing on Runway 9 with an ASDA of 6,150 feet would be subject to a weight penalty.

Table 2-3 Maximum Payloads with Reduced Runway 9 Usable Runway Length

Airplane Design Group (ADG) III Aircraft and Engine Type	Maximum Takeoff Weight (pounds)	Standard Day (59 Degrees Fahrenheit) Maximum Takeoff Weight (pounds)	Standard Day + 15 Degrees Celsius (86 Degrees Fahrenheit) Maximum Takeoff Weight (pounds)
Airbus (20% of Runway 9 Takeoff Operations)			
A321 – IAE V2500	206,132	185,000	182,500
A321 – CFM56	206,132	185,000	182,000
A320 – IAE V2500	174,165	162,000	160,500
A320 – CFM56	174,165	164,500	160,000
Boeing (15% of Runway 9 Takeoff Operations)			
737-700 – CFM56, 20K Thrust	154,500	139,500	136,000
737-700 – CFM56, 26K Thrust	154,500	No Penalty	No Penalty
737-800 – CFM56, 26K Thrust	174,200	157,000	154,000
737-900 – CFM56, 24K Thrust	174,200	146,500	142,500
737-900ER – CFM56, 26K Thrust	187,700	156,000	152,500

Source: U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B, *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019 (see Appendix B, *RIM Study*).

Shifting the Runway 27 threshold to the west would likely cause an increase in landing minimums due to the missed approach surfaces in relation to the existing downtown buildings and degrade the Runway 27 arrival capacity.

RSA Alternative 1 was eliminated from further consideration because it would adversely affect airfield operations, including airfield operating efficiency and the Airport's operating flows, shifting flights (and associated noise) to other runways, particularly during warmer temperatures when aircraft may be subject to greater takeoff weight restrictions. See Section 1.3.1 of the RIM Study (Appendix B, *RIM Study*) for more detailed information.

2.3.1.3 RSA Alternative 2 – Displaced Threshold Markings

Displaced thresholds are typically used to give arriving aircraft adequate clearance over an obstruction while still allowing departing aircraft the maximum amount of runway available for takeoffs. RSA Alternative 2 would shift the Runway 9 threshold to the west by 195 feet to maintain the full 7,001 feet of existing runway length for arrivals and departures on Runway 9-27 by restriping a segment of existing Taxiway M pavement immediately west of the existing Runway 9 End (**Figure 2-4**). Alternative 2 would decrease the existing RSA length deficiency from 850 feet to 655 feet, increasing the RSA length only marginally but would not result in the Runway 27 End meeting FAA's design requirements.

For Runway 27 arrivals, the displaced threshold would mean less LDA and shorter distance to the high-speed exit Taxiway E. This would diminish viability of Taxiway E (which impacts 60 percent of narrow body jets such as E175, E190, A320, A321, 737s as an exit point including:

- Potentially result in aircraft entering Taxiway E at a higher speed which could increase the potential for an inadvertent crossing of the Runway 4R-22L hold line or Land and Hold Short Operations (LAHSO) bar and possible runway excursions.
- Resulting in more aircraft crossing Runway 4R-22L to access either Taxiway M or K.
- Potential to increase runway occupancy times and decrease arrival capacity on Runway 27 due to loss of Taxiway E viability.
- Aircraft not exiting at Taxiway E would likely be directed to exit at either Taxiway M or Taxiway K, potentially increasing landing roll out times and operational delay.
- Loss of Taxiway E utility could trigger shifting most arriving aircraft to taxi to Taxiway K, potentially cause congestion in the vicinity of Taxiway K and M if aircraft are in queue to hold for crossing Runway 4L-22R on Taxiway K. It could also result in aircraft having to go-around for Runway 27 arrivals if the queue backs up beyond the Runway 27 hold line.

Aside from operational and efficiency considerations, RSA Alternative 2 would require lifting or modifying an existing injunction, which would require community involvement, court review, compliance with federal and state environmental review procedures, and potential further litigation, additional environmental review processes, and the approval of the FAA; the outcome of all these processes is not guaranteed and would take several years. Given the challenges presented by the injunction, the marginal increase in RSA length, and that the purpose and need of the Proposed Action could be achieved by other alternatives, RSA Alternative 2 was eliminated from further consideration. See Section 1.3.2 of the RIM Study (Appendix B) for additional details.

2.3.1.4 RSA Alternative 3A and 3B – Full RSA in Boston Harbor

RSA Alternatives 3A and 3B would extend the existing Runway 27 End RSA length from 150 feet to 1,000 feet, creating a full dimension RSA, of which approximately 850 feet would extend into Boston Harbor. RSA Alternative 3A (**Figure 2-5**) would be constructed on compacted fill and RSA Alternative 3B (**Figure 2-6**) would be constructed on a pile-supported deck; both would create a flat, graded area free of objects. While each of these alternatives would provide a fully compliant, full dimension RSA, at an average harbor depth of 25 feet, RSA Alternative 3A would require approximately 375,000 cubic yards of fill to an area of approximately 425,000 square feet (nearly 10 acres) in Boston Harbor. While RSA Alternative 3B would minimize the fill associated with RSA Alternative 3A, both alternatives would extend into the existing navigation channel. RSA Alternatives 3A and 3B were eliminated from further consideration because of the potential significant marine resource and harbor navigation impacts, and because the purpose and need of the Proposed Project could be achieved by other alternatives with substantially fewer environmental impacts. It is also unlikely a permit for work in the navigation channel and other marine resource areas could be obtained for Alternative 3A or 3B if another alternative has fewer impacts. See Section 1.3.3 in the RIM Study (Appendix B, *RIM Study*) for additional details.

2.3.1.5 RSA Alternative 4A – EMAS on 500-Foot-Wide Deck

RSA Alternative 4A would extend the length of the existing RSA from 150 feet to a maximum total length of 650 feet, with a 500-foot-wide deck (**Figure 2-7**). The EMAS would be 600 feet long and 300 feet wide and would be partially on land and partially on a 500-foot-wide by 500-foot-long deck structure extending into Boston Harbor. This alternative complies with FAA's RSA requirements using an EMAS installation. The RSA Alternative 4A EMAS was assumed to be like the length and width of the adjacent Runway 33L End EMAS and the dimensions would be confirmed during design. The 600-foot EMAS is approximate and corresponds to FAA's minimum RSA length requirements using an EMAS installation. The area of the deck would be 250,000 square feet (approximately 6 acres) over Boston Harbor and would be supported by pilings or caissons. The perimeter road would be realigned so that it is between the Runway 27 threshold and the beginning of the EMAS. However, RSA Alternative 4A was eliminated from further consideration because the 500-foot-wide deck would have greater navigation channel and environmental impacts compared to RSA Alternative 4B. See Section 1.3.4 in the RIM Study (Appendix B) for additional details.

2.3.1.6 RSA Alternative 4B – EMAS on 306-Foot-Wide Deck (Proposed Action)

RSA Alternative 4B would be like RSA Alternative 4A, except the deck would be 306 feet wide instead of 500 feet wide (**Figure 2-8**). The deck would be 500 feet long, a total of approximately 153,000 square feet (approximately 3.5 acres) over Boston Harbor.[6] The EMAS would be approximately 600 feet in length and approximately 170 feet in width, with final dimensions to be confirmed during design. FAA and Massport selected RSA Alternative 4B as the Proposed Project because it would "*provide the highest level of aircraft safety without reducing the operational capability of the BOS airfield while also minimizing environmental impacts from additional construction in the harbor.*"[7] See Section 1.3.4 in the RIM Study (Appendix B, *RIM Study*) for additional details.

Based on the findings of the RIM Study (see Appendix B, *RIM Study*), the FAA determined that the existing runway can be improved to enhance safety, and goes on to state that it reviewed the alternatives study to address the RSA deviations from design standards, and that the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of Alternative 4B – EMAS on a 300-foot wide deck (the actual width of the deck would be 306 feet to allow for safety rails). This determination by the FAA set the stage for Massport to develop the deck foundation support options in the Tier 2 analysis.

2.3.2 Summary of Tier 2 Deck Alternatives Screening

This section summarizes the development and screening of structural alternatives that were considered in Tier 2 in the DEIR for supporting a 306-foot wide by 450-foot-long RSA deck extending into Boston Harbor (deck support alternatives).[8] This section describes the screening criteria applied in Tier 2 and the

6 The RIM Study assumed the paved area at the end of the runway would end at the top of the existing riprap as it does now; however, to accommodate a transition slab from the pavement to the deck, as described for the Proposed Project, a sheet pile cutoff wall is required, extending the existing pavement from 150 to 200 feet and thereby reducing the required deck length from 500 feet identified in the RIM Study to a maximum of 450 feet.

7 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B, *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

8 While the RIM Study summarized in Section 2.3.1 assumed the paved area at the end of the runway would end at the top of the existing riprap as it does now, to accommodate a transition slab from the pavement to the deck, a sheet pile cutoff wall is required, extending the existing pavement from 150 to 200 feet. The sheet pile would reduce the required deck length from a maximum of 500 feet identified in the RIM Study to a maximum of 450 feet, to create a total maximum length of 650 feet and reducing the total area of the deck from 3.5 acres to 3.2 acres.

justification for elimination or progression of each deck support alternative for detailed environmental analysis.

The deck support alternatives were developed to be structurally sufficient to support the deck, the EMAS, an aircraft, and emergency vehicles and is designed for a 75-year design life. Each alternative was designed to be capable of withstanding anticipated coastal storm events and to withstand anticipated sea level rise to the greatest extent possible while also meeting FAA's design criteria.[9]

The two potential types of support structures for the deck are piles and caissons (or drilled shafts). Piles are long, typically circular, or square elements of between 12 to 36 inches in diameter or per side. They would be made from precast concrete, would be transported to the construction site, and would be driven into the ground using vibration or impact (pile driving). Caissons, which are circular columns typically much larger than piles (3 to 12 feet in diameter), would be constructed on the Project Site. A hole would be drilled into the bedrock into which structural steel would be placed and concrete would be pumped into the hole, creating a column. The number and spacing of the piles or caissons are dependent on the structural load they must support and the size and strength of the individual elements. The deck could be supported by many small diameter piles spaced close together or by fewer, larger diameter caissons spaced farther apart. Increasing the pile spacing generally requires increasing the size and weight of the horizontal structure on top of the piles or caissons on which the deck would be constructed. The number and spacing of the piles or caissons are also affected by the available strength of the subsurface soil formation.

The piles or caissons would be arranged in a grid pattern, as shown in **Figure 2-9**. In one direction of the grid, the piles or caissons would be fastened together at the top by pile-caps and the connected rows are referred to as "bents." As shown in **Figure 2-9**, the spacing between the piles or caissons in the rows may be different than the spacing between the bents. Four deck support alternatives, two each supported by piles and by caissons, were evaluated during the development of the DEIR are described in **Table 2-4**.

In the Tier 2 Alternatives analysis, the deck support alternatives were screened based on their potential permanent environmental impacts and short-term impacts to operation of the airfield during construction, as shown in **Table 2-5**. Other potential construction factors considered in comparing the deck support alternatives are shown in **Table 2-6**. **Table 2-7** shows the results of applying the screening criteria to the four deck support alternatives. The four deck support alternatives are illustrated in **Figure 2-10**. **Figure 2-11** depicts the Sponsor's Proposed Action, Deck Support Alternative 2, which consists of an improved RSA with EMAS constructed partially on a 306-foot-wide deck supported by 326 vertical and batter piles.

9 FAA's design criteria restrict the slope of and changes in the grade of runways and RSAs (U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022). Thus, the RSA must match the grade of existing Runway 9-27 and be relatively flat and free from bumps. During the 2020 rehabilitation of Runway 9-27, the Runway 27 End was raised approximately 10 inches to bring the runway into compliance with FAA's design standards and to accommodate sea level rise.

Figure 2-9 Typical Pile/Caisson Configuration

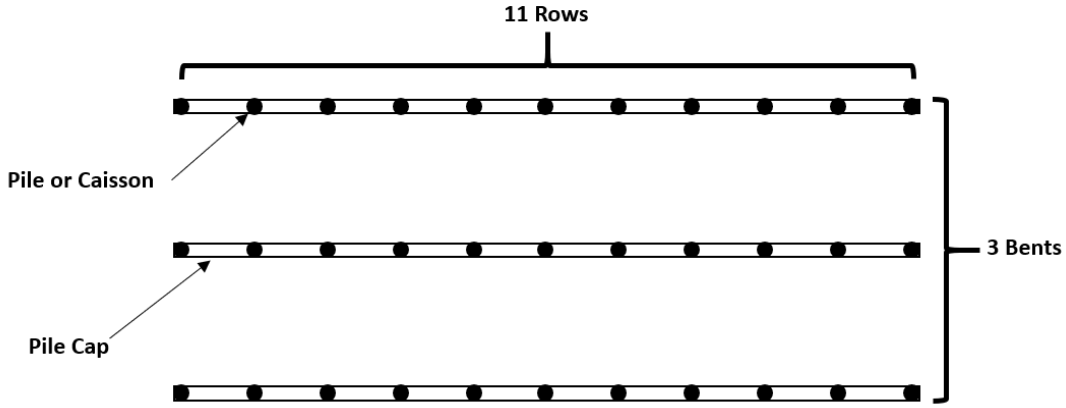


Table 2-4 Runway 27 End RSA Deck Support Alternatives

Deck Support Alternative	Deck Support Type	Size of Pile or Caisson (inches)	Number of Piles or Caissons	Number of Batter Piles[1]	Total Number of Piles	Number of Bents[2]	Approximate Bent Spacing (feet)
1	Concrete Pile	20" x 20"	384	32	416	25	12.6'
2	Concrete Pile	20" x 20"	294	32	326	10	50'
3	Caisson	60" diameter	160	0	160	10	50'
4	Caisson	60" diameter	128	0	128	8	65'

1 Batter piles are bracing piles driven at an angle to the vertical to provide resistance to horizontal forces.
2 A bent is an array of piles or drilled shafts in a row and fastened together at the top by a pile-cap or bracing.

Table 2-5 Tier 2 Deck Support Alternative Screening Criteria

Screening Criteria	Description
Permanent Wetland Resource Area Impacts	• Total footprint on the seabed and intertidal area directly impacted by piles or caissons (square feet) • Scour of the seabed or intertidal area caused by changes in the water flow in the immediate area of the deck (cubic yards)[1]
Construction Impacts to Airfield Operations	• Runway 9-27 must be closed during construction of the Runway Safety Area (RSA) improvements as equipment and people cannot be in the RSA during use. o Arrivals: 22% of airport jet aircraft (Runway 27 only) o Departures: 42% of airport jet aircraft • To minimize construction disruptions, Massport determined the maximum practical runway closure time is 60 consecutive days in each of two consecutive construction seasons (two years), for a total of 120 days. Therefore, alternatives requiring more than 120 days of construction are not practical.

1 For all the deck support alternatives, the model indicated no scour under typical conditions for the type of sediments present at the Project Site. Therefore, to conduct a comparative analysis of scour effects under worst case and very long-term conditions, including many major storms, current speed (or flow velocity) equivalent to 1.5 times the normal flow condition was applied to the flow model to yield a scour result for each alternative that is useful for comparative purposes, but that is overstated in terms of the effects of each alternative under typical conditions.

Table 2-6 Other Deck Support Alternative Considerations

Consideration	Description
Mobilization Flexibility	Flexibility to demobilize and remobilize during construction in the water (e.g., if Runway 9-27 must be temporarily reopened during the closure periods due to an emergency requiring closure of other runway(s) or if severe weather, such as a hurricane, requires equipment to move to a protected location). Because they are fabricated offsite and only require installation, whereas caissons are constructed onsite, piles offer more flexibility.
Navigation Channel Impact	Duration of impacts to the navigation channel that would occur from the moving of construction barges adjacent to and in the channel (based on the duration of each alternative's construction schedule)
Estimated Construction Noise	Estimated construction noise impacts to surrounding neighborhoods: The approximate maximum sound level (Lmax) experienced at the closest residences from installing pilings or caissons[1] and the duration of noise impact (based on the duration of pile driving or caisson construction)

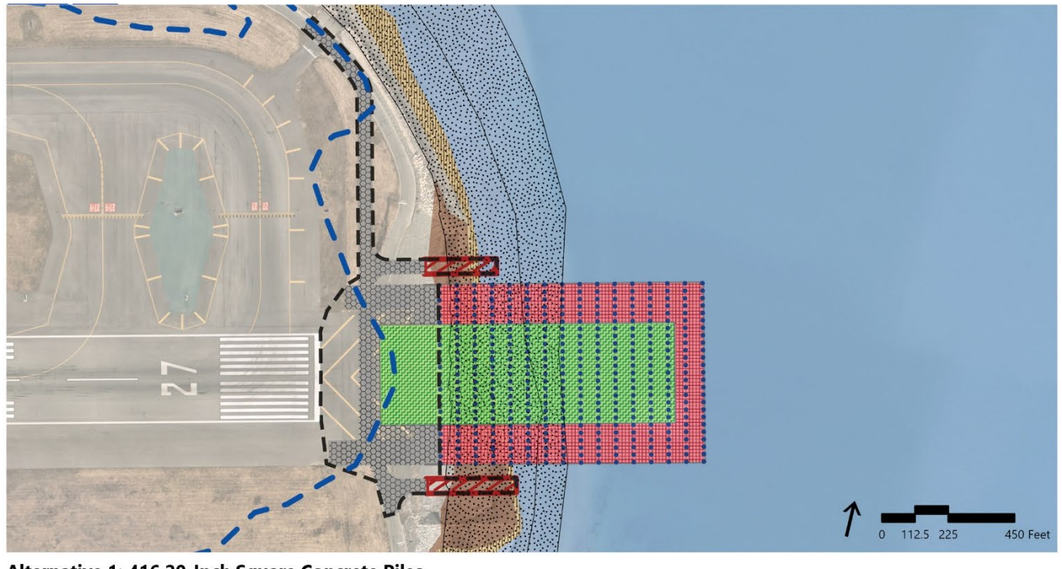
1 The closest residences are in Winthrop approximately 2,400 feet from the outer edge of the deck. At 2,400 feet, the Lmax from an impact or vibratory driver used to install piles would be approximately 68 dBA; the Lmax from an auger drill used to drill the shafts for the caissons would be approximately 50 dBA. To put these noise levels in context: Massport voluntarily follows the City of Boston Noise Control criteria which prohibit any individual piece of construction equipment from generating a noise level exceeding 86 dBA at 50 feet from the device; impact devices, such as impact or vibratory drivers, are exempt (Regulations for the Control of Noise in the City of Boston, City of Boston, Air Pollution Control Commission). Noise from a vacuum cleaner at 10 feet is approximately 69 dBA and noise from a dishwasher in the next room is approximately 50 dBA.

Table 2-7 Tier 2 Screening Results and Other Considerations for Deck Support Alternatives

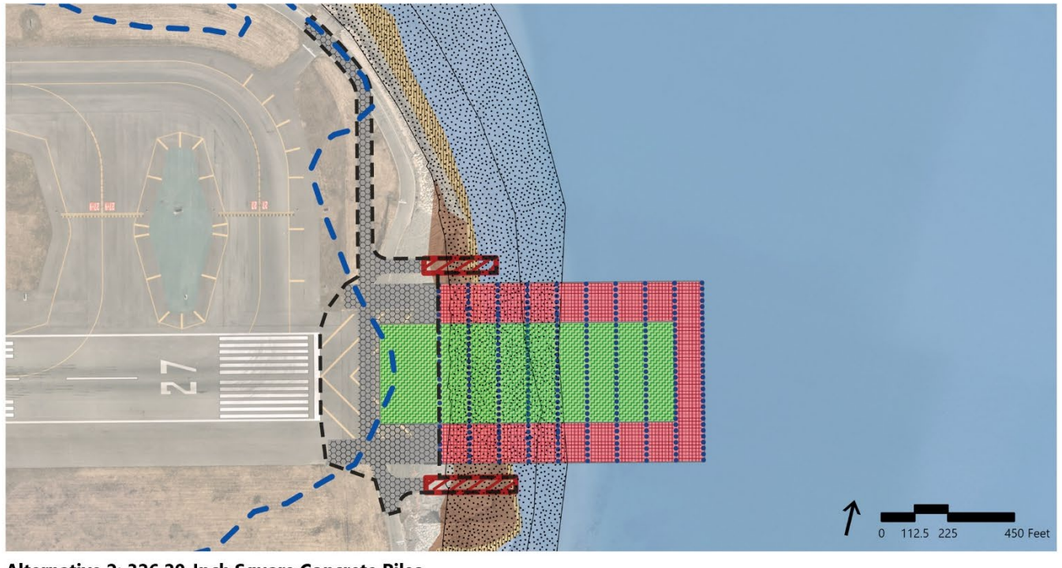
Screening Criteria	Deck Support Alternatives			
	Alternative 1: 416 Piles	**Alternative 2: 326 Piles**	**Alternative 3: 160 Caissons**	**Alternative 4: 128 Caissons**
Coastal Wetlands Resource Area Impact:				
Permanent total footprint of piles/caissons (total square feet)[1]	1,160	910	3,140	2,510
Permanent total scour (total cubic yards)[2,3]	380	340	1,060	1,120
Runway Closure/Airfield Disruption: Can construction be completed in 120 days or less?	No	Yes	No	No
Other Considerations				
Mobilization Flexibility	More flexible	More flexible	Less flexible	Less flexible
Navigation Channel Effects	>120 days	120 days	>216 days	>168 days
Estimated Construction Noise	68 dBA for 41 days	68 dBA for 27 days	50 dBA for 216 days	50 dBA for 168 days

1 Total number of piles or caissons multiplied by the area per pile or caisson (2.8 square feet per pile and 19.6 square feet per caisson).
2 Modeled using the Federal Highway Administration of the U.S. Department of Transportation Hydraulic Engineering Circular No. 18 (HEC-18) method under normal tide conditions for Boston Harbor.
3 No scour is anticipated under typical conditions and with the cohesive materials within the Proposed Project Site. To conduct a comparative analysis of scour effects, current speed (or flow velocity) equivalent to 1.5 times the normal flow condition was applied to the flow model to yield a scour result for each alternative that is useful for comparative purposes, but that is overstated in terms of the effects of each alternative under typical conditions.

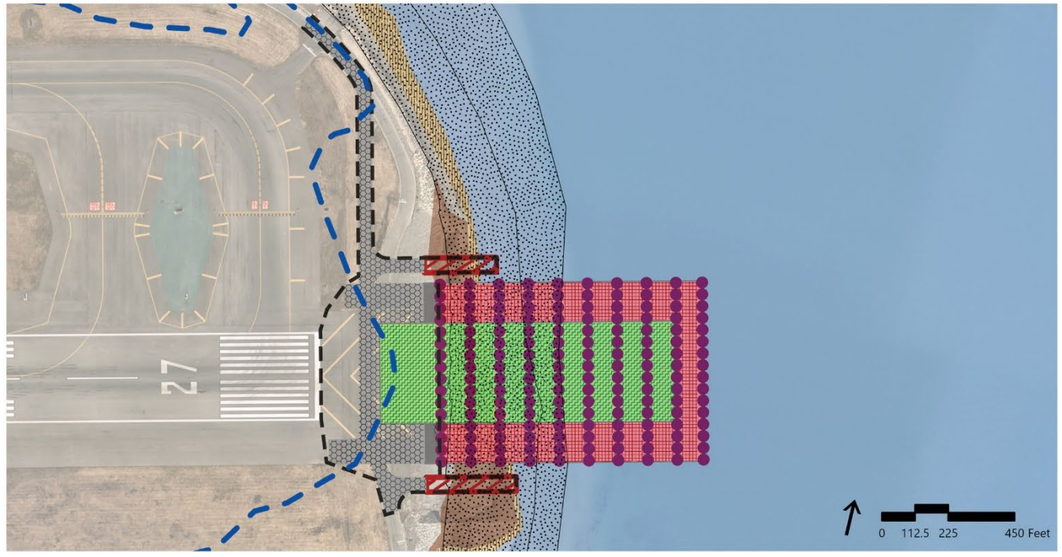
This Page Intentionally Left Blank



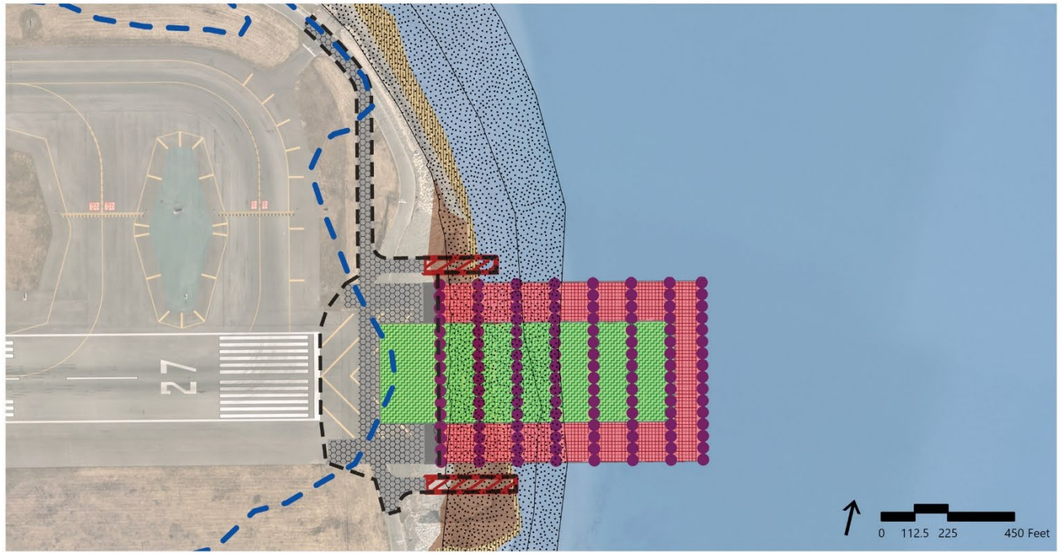
Alternative 1: 416 20-Inch Square Concrete Piles



Alternative 2: 326 20-Inch Square Concrete Piles



Alternative 3: 160 60-Inch Diameter Caissons

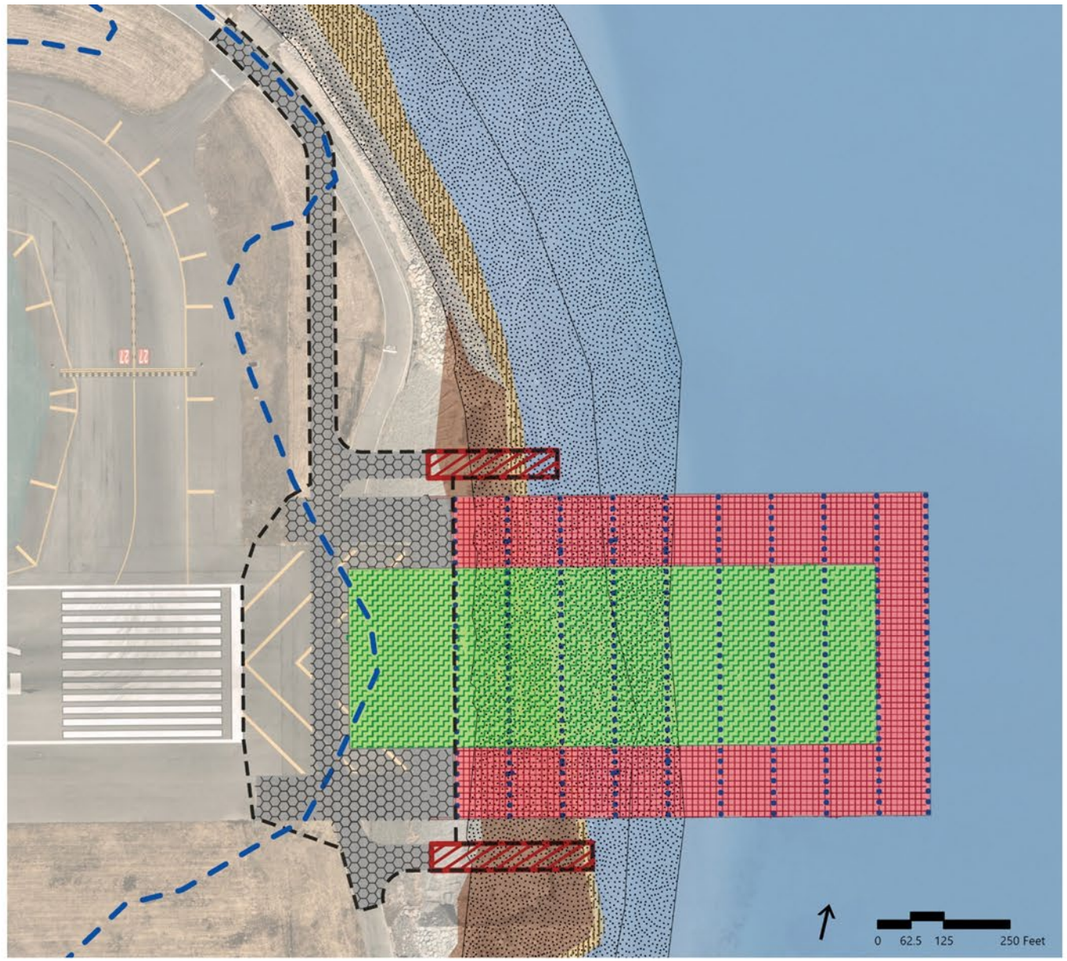


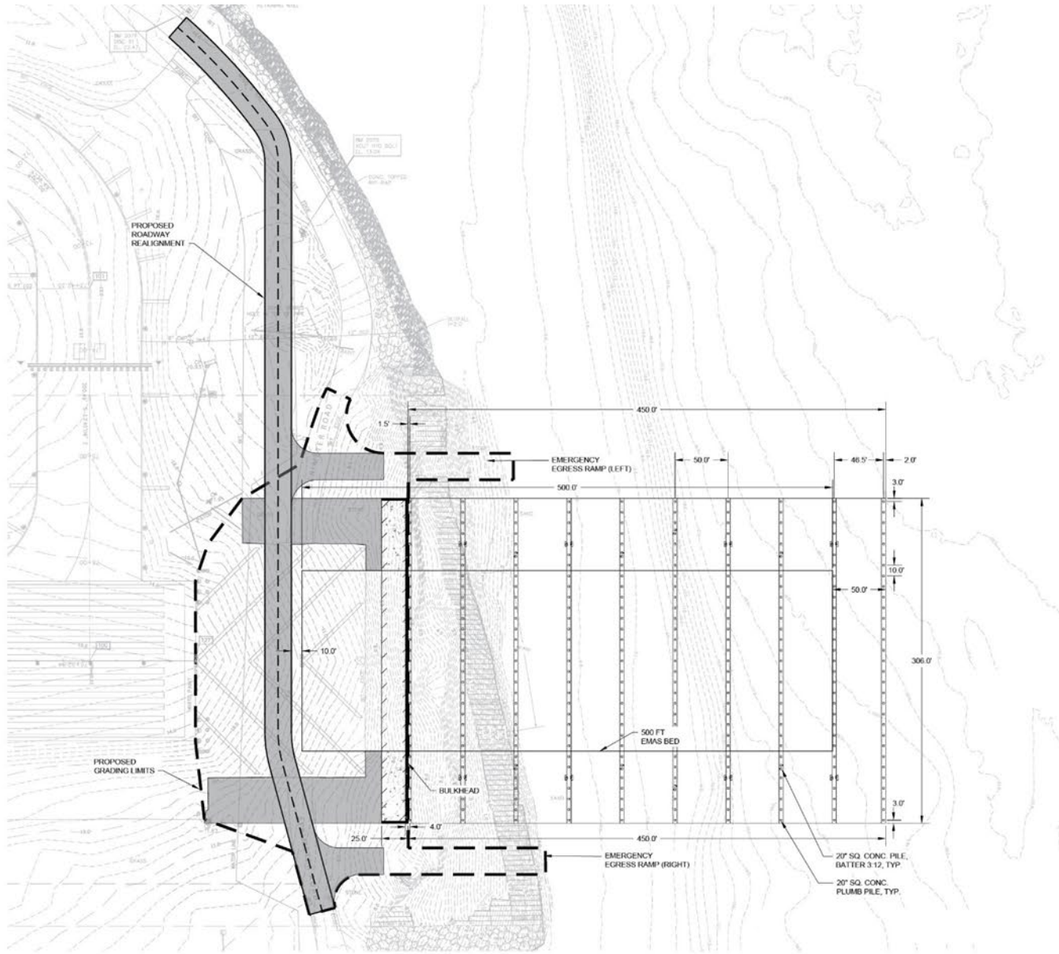
Alternative 4: 128 60-Inch Diameter Caissons

\\vhb\gbl\proj\Wat-EV\14792.00 WSP - MPA Runway 9-27\Reports\DEIR-EA\Drafts\Figures

Figure 2-10: RSA Deck Support Alternatives (Tier 2 Screening) **Runway 27 End RSA Improvements Project**

- Proposed Grading Limits
- Proposed Pile-Supported Deck
- Proposed Engineered Materials Arresting System (EMAS) Bed
- Proposed Pavement
- Proposed Piles
- Proposed Caissons
- Proposed Approach Slab
- Proposed Emergency Ramp
- Coastal Beach
- Land Under Ocean
- Land Subject to Tidal Action
- Federal Emergency Management Agency (FEMA) 100-Year Flood Level
- Land Containing Shellfish





326 20-Inch Square Concrete Piles

The pile configuration includes:

- 326 total piles (294 vertical piles and 32 batter piles)
- 20-inch square concrete piles driven to rock in 10 bents[1] of 31 piles each
- Bents spaced 50 feet apart and piles within each bent spaced 11 feet apart

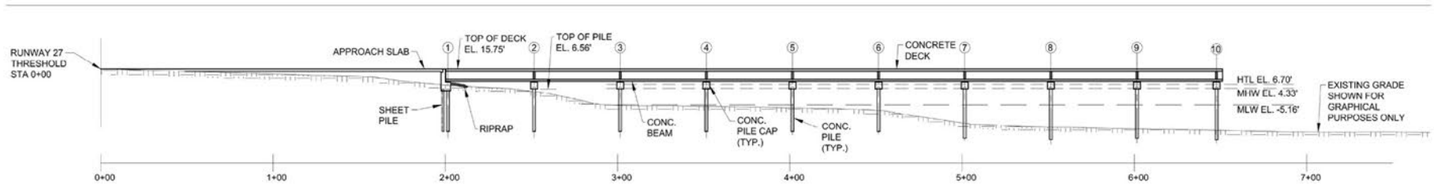


FIGURE 2-11: RSA Deck Support Alternative 2 **Runway 27 End RSA Improvements Project**

Proposed Grading Limits
Proposed Pile-Supported Deck
Proposed Engineered Materials Arresting System (EMAS) Bed
Proposed Pavement
Proposed Piles
Proposed Approach Slab
Proposed Emergency Ramp
Coastal Beach
Land Under Ocean
Land Subject to Tidal Action
Federal Emergency Management Agency (FEMA) 100-Year Flood Level
Land Containing Shellfish

1 A bent is an array of piles in a row and fastened together at the top by a pile cap.

\\vhb\gbl\proj\Wat-EV\14792.00 WSP - MPA Runway 9-27\Reports\DEIR-EA\Drafts\Figures

3 Affected Environment and Environmental Consequences

3.1 Introduction

The Affected Environment and Environmental Consequences for the Runway 27 End Runway Safety Area (RSA) Improvements Project (the Project or the Proposed Project[1]) are documented for each applicable environmental resource category, as specified in Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures*,[2] and 301 Code of Massachusetts Regulations (CMR) 11.07(6), to provide a context for understanding the impacts of the Proposed Project. The information and analysis provided in this chapter responds to the scope and comments received on the state Draft Environmental Impact Report (DEIR), the Certificate of the Secretary of the Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs (EEA) on the DEIR (Secretary's Certificate) (see Appendix A, *Response to DEIR Comments*), and provides an analysis of whether an impact is significant in accordance with FAA NEPA guidance.

The Affected Environment and Environmental Consequences of project alternatives were fully described in Chapter 4 and Chapter 5 of the DEIR and are summarized in this chapter. This chapter summarizes the character of the environment in which the proposed Runway 27 End RSA Improvements Project would occur as well as the regulatory setting. It also describes environmental consequences when compared to the No Action Alternative. The Project Study Area includes the proposed improvement area at the end of Runway 27, and adjacent environmental resources that could be affected by the Proposed Project (**Figure 3-1**). Direct, indirect, and construction impacts are included in the discussion of each impact category for the Study Area. Direct impacts are those caused by the action and occur at the same time and place (see 40 Code of Federal Regulations [CFR] § 1508.8(a)). Indirect impacts are caused by the action but occur later in time or farther removed in distance but are still reasonably foreseeable (see 40 CFR § 1508.8(b)). Key findings related to each environmental resource category are summarized in

1 Although Federal Aviation Administration Orders 1050.1F and 5050.4B use "Proposed Action" to describe the solution the airport sponsor wishes to implement to solve the problem it is facing, "Proposed Project" is used in this Draft Environmental Assessment/Final Environmental Impact Report to maintain consistency with the Draft Environmental Impact Report filed with the Massachusetts Executive Office of Energy and Environmental Affairs on June 30, 2022, per the requirements of the Massachusetts Environmental Policy Act.

2 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, July 16, 2015.

Section 3.1.1, along with the significant impact thresholds identified in FAA Order 1050.1F. The cumulative impacts of the Proposed Project, in combination with impacts from past and future reasonably foreseeable projects, are summarized in Section 3.15. Mitigation measures for each affected resource category are identified in Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*, of this Draft Environmental Assessment/Final Environmental Impact Report (Draft EA/Final EIR).

3.1.1 Key Findings and Significance Thresholds

The Proposed Action was compared to the No Action Alternative to determine the effect (beneficial or adverse) on each environmental resource category. This Draft EA/Final EIR provides an analysis of whether that impact is significant, based on FAA guidance on impact thresholds for significant adverse effects provided in FAA Order 1050.1F.[3] **Table 3-1** summarizes the thresholds of significance used to determine the potential for impacts and identifies the environmental impact categories that the Proposed Action could potentially affect, along with a summary of key findings from the Project. Measures proposed to avoid, reduce, and/or mitigate the potential impacts summarized in this chapter are presented in Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*.

3.2 Resource Categories Not Present

Some resource categories were initially considered but not further evaluated due to either their absence from the Study Area (**Figure 3-1**), or because the proposed safety improvements would not change aircraft operations or passenger activity levels and therefore would not affect the resource category. Impact categories not present or affected by implementation of any alternatives include:

- Department of Transportation Act, Section 4(f) resources
- Farmlands
- Wild and Scenic Rivers

3 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, Exhibit 4-1, "Significance Determination for FAA Actions," pages 4-4 to 4-13, July 16, 2015.

Table 3-1 FAA Order 1050.1F Significant Impact Thresholds/Summary of Key Findings and Potential Impacts

Impact Category	FAA Order 1050.1F Significant Impact Threshold/ Factors to Consider	Summary of Project Findings and Potential Impacts	Significant Impact?
Air Quality Section 3.3	When a project or action exceeds one or more of the National Ambient Air Quality Standards (NAAQS) for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.	▪ Upon project completion, there will be no permanent changes to aircraft fleet mix, the number of operations, or runway use. ▪ Construction would result in temporary increases in air pollutants, but emissions would be below the *de minimis* standards for General Conformity with the NAAQS.	**No**
Biological Resources (Including Fish, Wildlife, and Plants) **Section 3.4**	For federally listed species: When the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service determines a proposed action would be likely to jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat. None established for non-listed species.	*Rare and Endangered Species* ▪ The Project is not likely to adversely impact federally listed threatened or endangered species under U.S. Fish and Wildlife Service (USFWS) jurisdiction (terrestrial species). Consultation with the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is ongoing (marine species). ▪ A portion of the Project is within Estimated and Priority Habitat for two state-listed grassland bird species: the endangered upland sandpiper (*Bartramia longicauda*) and species of special concern Eastern meadowlark (*Sturnella magna*). About 20,300 square feet of grassland habitat would be permanently altered by this safety Project. An additional 22,000 square feet of grassland would be temporarily altered during construction. Massport will work with the Massachusetts Natural Heritage and Endangered Species Program (NHESP) to identify suitable locations within the airfield where existing pavement can be removed to create new grassland habitat to offset Project impacts. Temporarily altered grassland will be restored in place with a seed mix approved by NHESP. *Finfish Resources* ▪ Some fish habitats would be displaced by the pilings. However, the pilings would offer new hard substrate for encrusting marine animals and algae. ▪ Massport will adhere to the time-of-year (TOY) restriction for in-water, silt producing work from February 15 through June 30 to protect winter flounder spawning during construction.	**No**

Impact Category	FAA Order 1050.1F Significant Impact Threshold/ Factors to Consider	Summary of Project Findings and Potential Impacts	Significant Impact?
Climate Section 3.5	None established; no specific factors to consider in making a significance determination for greenhouse gas (GHG) emissions have been identified.	▪ The Runway Safety Area (RSA) deck would be designed to withstand anticipated coastal storms and sea level rise. According to the Resilient Massachusetts Action Team (RMAT) Climate Resilience Design Standards Tool Output Report (see Appendix E.3), the Project Site would have a high risk to climate hazards due to its exposure to sea level rise/storm surges, extreme precipitation due to urban flooding, and extreme heat. The Project would not increase climate risk to properties in the vicinity. ▪ The Project would not change Airport operations or surface transportation patterns, and therefore, would not result in a permanent change in GHG emissions. GHG emissions would temporarily increase during construction.	**No**
Coastal Resources Section 3.6	None established. Consider if the action would: ▪ Be inconsistent with the state coastal zone management plan(s); ▪ Impact a coastal barrier resources system unit (and the degree to which the resource would be impacted); ▪ Pose an impact to coral reef ecosystems (and the degree to which the ecosystem would be affected); ▪ Cause unacceptable risk to human safety or property; or ▪ Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.	*State and Federal Wetlands* ▪ The proposed pile-supported deck (approximately 450-foot-long by 306-foot-wide) has an overall watersheet footprint of approximately 3.2 acres. The area is subject to federal jurisdiction as Waters of the U.S., and is state-regulated Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, and Land Under the Ocean. Because the RSA deck will be elevated, the direct alteration of marine resources would be restricted to the footprint of the pilings and would occur in the following resource types: Land Subject to Tidal Action (LSTA), Land Under the Ocean, Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish (see **Table 3-4**). Portions of this area have been previously altered. ▪ The Project would not change wave direction or velocity, nor result in increased erosion or deposition in the marine environment. Minor scour effects are anticipated. ▪ A turbidity curtain would be deployed around the active construction work area to contain sediment resuspended during pile-driving activities. *Tidelands/Public Benefits and Navigation* ▪ The Project would alter the shoreline due to the installation of a pile-supported deck. Portions of that shoreline have been previously altered. ▪ The RSA deck would be located within the Logan Airport Security Zone about 175 feet from the navigation channel at its nearest point. The deck would not limit vessel navigation outside the deck or between the deck and the navigation channel. ▪ The RSA deck would extend up to approximately 460 feet beyond the State Harbor Line.	**No**

Impact Category	FAA Order 1050.1F Significant Impact Threshold/ Factors to Consider	Summary of Project Findings and Potential Impacts	Significant Impact?
Hazardous Materials and Solid Waste Section 3.7	None established. Consider if the action would: ▪ Violate applicable laws or regulations; ▪ Involve a contaminated site; ▪ Produce an appreciably different quantity or type of hazardous waste; ▪ Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or ▪ Adversely affect human health and the environment.	▪ No sites within the Study Area are listed on the U.S. Environmental Protection Agency's (USEPA) National Priorities List (NPL) or in the Massachusetts Department of Environmental Protection (MassDEP) online databases. ▪ No adverse impacts are anticipated.	**No**
Historical, Architectural, Archaeological, and Cultural Section 3.8	None established. Consider if the action would result in a finding of Adverse Effect through the Section 106 process.	▪ No impacts to historic resources are anticipated, as there are no identified above ground or archaeological resources in the Area of Potential Effect (APE).	**No**
Land Use Section 3.9	None established. Normally dependent on the significance of other impacts.	▪ The Project would not result in changes to existing land uses on- or off-Airport at any point during construction or operation. No permanent impacts to noise-sensitive land uses are anticipated.	**No**
Natural Resources and Energy Supply Section 3.10	None established. Consider if the action would cause demand to exceed available or future supplies.	▪ No permanent impacts to natural resources and energy supply anticipated, nor significant impacts resulting from construction activities.	**No**
Noise Section 3.11	The action would increase noise by Day-Night Average Sound Level (DNL) 1.5 decibels (dB) or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase compared to the no action alternative.	▪ The Project consists of safety enhancements and would not extend the length of Runway 9-27 or affect normal runway operations, capacity, runway use, or the types of aircraft using the runway. ▪ Construction noise is anticipated to occur for 120 days total during two separate 60-day periods. Noise levels are not anticipated to exceed City of Boston construction noise limit criteria.	**No**

Impact Category	FAA Order 1050.1F Significant Impact Threshold/ Factors to Consider	Summary of Project Findings and Potential Impacts	Significant Impact?
Socio-economics Section 3.12	None established. Consider if the action would: ▪ Induce substantial economic growth in an area; ▪ Disrupt or divide an established community; ▪ Cause extensive relocation when sufficient replacement housing is unavailable; ▪ Cause extensive relocation of businesses; ▪ Disrupt traffic patterns and reduce levels of service of roads serving an airport and its communities; or ▪ Substantially change the community tax base.	▪ The Project is intended to improve safety and would not affect the socioeconomic characteristics of the area. It would not relocate houses or businesses, disrupt local traffic patterns, or cause a loss in the community tax base. Project construction would have a positive jobs and economic impact.	**No**
Environmental Justice (EJ) Section 3.12	None established. Consider if the action would disproportionately impact an EJ population due to: ▪ Significant impacts in other impact categories; or ▪ Impacts on the physical or natural environment that affect an EJ population in a way that the Federal Aviation Administration (FAA) determines are unique to the EJ population.	▪ No disproportionate adverse impacts to EJ populations are anticipated from this safety project. The Project would not permanently change runway operations, capacity, runway use, or types of aircraft using the runway. ▪ Project construction would be temporary and would not exceed applicable significant impact thresholds for noise, air quality, or water quality. ▪ The potential shifting of flights during construction is not anticipated to disproportionately impact EJ populations. Any shifting of flights would be utilizing existing flight paths and is subject to wind, weather, and FAA safety requirements as is the current condition.	**No**
Children's Health & Safety Section 3.12	None established. Consider if the action would lead to a disproportionate health or safety risk to children.	▪ The Project would not significantly impact air quality or water quality, change noise levels, relocate residences, or permanently change surface traffic. It would not create or make more readily available products or substances that could harm children.	**No**
Light Emissions Section 3.13	None established. Consider the degree the action may: ▪ Annoy or interfere with normal activities; and ▪ Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.	▪ No new airfield or runway-related navigational light sources are proposed. Lighting on the proposed RSA deck, along with lighting on a relocated security zone buoy, is anticipated to be minor given the existing urban setting and distance to residential neighborhoods across Boston Harbor. The Project is not expected to alter the overall extent of light emissions within the viewsheds of potentially sensitive areas.	**No**
Visual Resources /Visual Character Section 3.13	None established. Consider the extent the action would: ▪ Affect the visual character of the area; ▪ Contrast with the visual resources and/or visual character in the study area; and ▪ Block or obstruct the views of visual resources.	▪ The view of the shoreline from the closest residential neighborhoods is not anticipated to be substantially different than the existing view given the elevation of the proposed RSA deck and in context of the surrounding Airport environment and Winthrop and East Boston setting.	**No**

Impact Category	FAA Order 1050.1F Significant Impact Threshold/ Factors to Consider	Summary of Project Findings and Potential Impacts	Significant Impact?
Wetlands Section 3.14	The action would: ▪ Adversely affect a wetland's function to protect municipal water supplies; ▪ Substantially alter the hydrology needed to sustain a wetland system's values and functions; ▪ Substantially reduce the wetland's ability to retain floodwaters or storm runoff; ▪ Adversely affect the maintenance of natural systems supporting habitat or timber, food, or fiber resources; ▪ Promote development of secondary activities or services, causing circumstances above to occur; or ▪ Be inconsistent with state wetland strategies.	▪ Mitigation measures for impacts to wetlands are proposed. Massport proposes a wetland mitigation goal of 1:1 restoration or replacement of 1,200 square feet of filled wetland area (piles and emergency egress ramps) via construction or restoration of mud flat based on current U.S. Army Corps of Engineers (USACE) and MassDEP guidance. In close coordination with the resource agencies, mud flat mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. The proposed RSA deck will overshadow coastal wetland resources, but they will continue to provide functional value such as habitat, storm damage prevention, protection of land containing shellfish, and protection of fisheries.	**No**
Floodplains Section 3.14	The action would cause notable adverse impacts on natural and beneficial floodplain values.	▪ The Project would require work within 97,200 square feet of coastal floodplain. Work will generally maintain the existing elevation and not significantly reduce floodplain volume. Any filling of floodplain will not impact future flood elevations.	**No**
Surface Waters Section 3.14	The action would: ▪ Exceed water quality standards of federal, state, local, and tribal regulatory agencies; or ▪ Contaminate public drinking water supply such that public health may be adversely affected.	▪ The Project is not anticipated to result in a significantly higher pollutant load than existing conditions nor increase total suspended solids. ▪ Turbidity may be caused during installation of the piles and could temporarily affect water quality in a localized area. A turbidity curtain would be deployed to contain sediment during pile driving.	**No**
Groundwater Section 3.14	The action would: ▪ Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies; or ▪ Contaminate an aquifer used for public water supply such that public health may be adversely affected.	▪ The Project would not have a significant adverse effect on water quality. Subsurface conditions at the Airport are not conducive to infiltration and groundwater levels are tidally influenced.	**No**

Source: U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, Exhibit 4-1, "Significance Determination for FAA Actions," pages 4-4 to 4-13, July 16, 2015; U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, *1050.1F Desk Reference*, Version 2, February 2020.

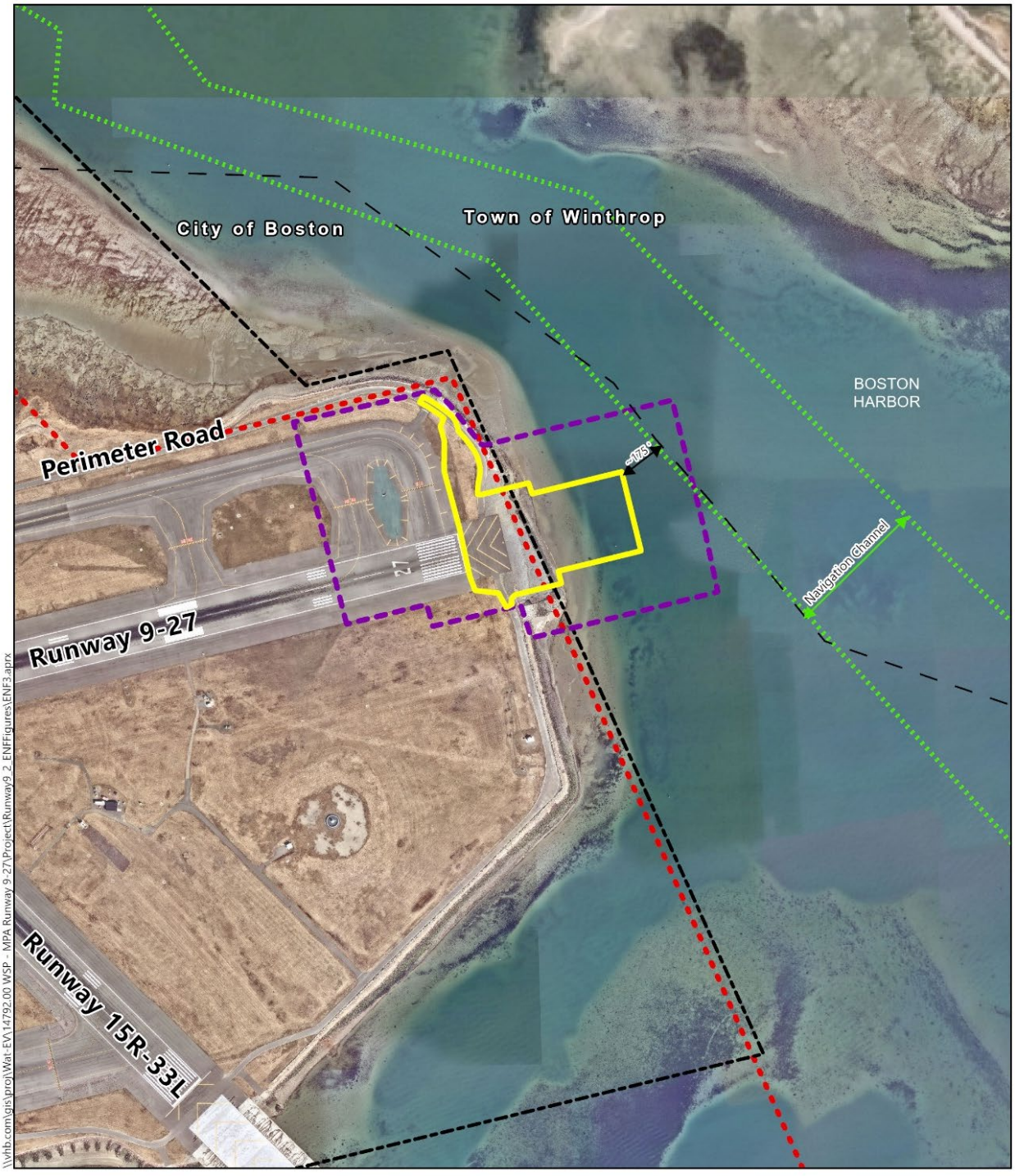


FIGURE 3-1: Project Study Area **Runway 27 End RSA Improvements Project**

Study Area
Proposed Project Site
Logan Airport Property Line
Political Jurisdictions
Designated Navigation Channel
Massachusetts Harbor Line (Approximated per Chapter 733 Acts of 1966)

0 250 500 1000 Feet

Sources: Nearmap Imagery, March 2022; Commonwealth of Massachusetts, Topographical Survey Commission, Atlas of the Boundaries of the Town of Winthrop, Suffolk County, 1898.

3.3 Air Quality

Massachusetts state law, the federal Clean Air Act (CAA), and the NAAQS (40 CFR part 50) govern air quality in Massachusetts. The NAAQS and the Massachusetts State Implementation Plan (SIP) promulgated pursuant to, and in compliance with the CAA and the 1990 amendments to the CAA, regulate air quality issues in the Study Area. The CAA requires the U.S. Environmental Protection Agency (USEPA) to set NAAQS for six common air pollutants (known as criteria air pollutants): carbon monoxide (CO); lead (Pb); nitrogen dioxide (NO_2); ozone (O_3); sulfur oxides (SO_x); and particulate pollution (including particulate matter smaller than or equal to 10 microns in diameter [PM_{10}] and particulate matter smaller than or equal to 2.5 microns in diameter [$PM_{2.5}$]).

In accordance with the CAA, and based on air quality monitoring, all areas within Massachusetts are designated with respect to the NAAQS as either in attainment, nonattainment, maintenance, or unclassifiable.[4] The Boston area is presently designated as attainment/maintenance for CO, indicating that it is in transition back to attainment for CO. The Boston metropolitan area is otherwise designated as attainment for all other criteria pollutants.

3.3.1 Affected Environment

The most recent emission inventory for Logan Airport was completed for calendar year 2019. The inventory included Volatile Organic Compounds (VOCs), CO, NO_x, $PM_{2.5}$, and PM_{10}. Emissions of ozone were not included because it is a secondary pollutant formed by emissions of NO_x and VOCs, which serve as a surrogate for ozone formation. There were no exceedances for any criteria pollutants at Logan Airport in 2019.[5]

3.3.2 Environmental Consequences

There would be no changes in air emissions under the No Action Alternative as the affected environment would remain unchanged.

There would be no permanent direct or indirect impacts to air quality resulting from the proposed Runway 27 End RSA Improvements Project. The Proposed Project would not permanently change the daily aircraft operations, type of aircraft, or location in which aircraft operate.

The proposed Runway 27 End RSA Improvements Project would temporarily generate emissions associated with construction activities. As described below, the emissions of air pollutants during construction would be below the *de minimis* standards for General Conformity with the NAAQS.

3.3.2.1 Construction Period

Construction activities resulting from the RSA improvements represent a short-term source of air emissions and include the following:

- Exhaust emissions from on-road construction vehicles;

4 An area with air quality better than the NAAQS is designated as attainment; an area with air quality worse than the NAAQS is designated as nonattainment; and an area that is in transition from nonattainment to attainment is designated as attainment/maintenance. Nonattainment areas are further classified as extreme, severe, serious, moderate, or marginal by the degree of non-compliance with the NAAQS.

5 Massachusetts Port Authority. Logan Airport 2018/2019 Environmental Data Report, Appendix I, Air Quality. EEA #3247, December 2020. https://www.massport.com/media/41rkxcxd/2018-19-edr_final-part-1.pdf.

- Off-road construction equipment;
- Marine transport vessels;
- Evaporative emissions from asphalt placement and curing; and
- Generation of fugitive dust from disturbance of unpaved areas.

Construction Period Aircraft Operations

Construction associated with the safety project would result in the temporary closure of Runway 9-27 during each of the planned 60-day construction periods in 2025 and 2026. During the closures, aircraft operations would temporarily shift from Runway 9-27 to other runways already in use, temporarily increasing the number of operations along the existing flight paths of other runways. Overall operations would remain the same with the equivalent decrease in Runway 9-27 operations. The short-term shift in runway use will depend on wind, weather, and FAA air traffic control safety determinations.

If the FAA is utilizing a northeast flow aircraft traffic pattern, aircraft that would have departed from Runway 9 are expected to shift primarily to Runway 4R; in a southwest flow, aircraft that would have landed on Runway 27 are expected to primarily shift to Runway 22L. In a northwest flow, aircraft that would have landed or departed on Runway 27 are expected to shift primarily to Runway 33L or Runway 32. There is expected to be minimal impact from the Project on the continued preferential use of Runway 15R for late-night departures and Runway 33L for late-night arrivals (a noise abatement procedure to route late-night operations over water rather than over noise-sensitive land uses).

During the summer of 2021, approximately 10 percent of arrivals used Runway 27 and, during a similar closure to Runway 9-27 in 2020, these arrivals primarily used Runway 22L instead. In 2021, approximately 24 percent of departures used Runway 9 and 9 percent used Runway 27. During the closure of Runway 9-27 in 2020, most Runway 9 departures shifted to Runway 4R and a small portion to Runway 15R. The Runway 27 departures shifted primarily to Runway 22R. However, it is not possible to predict what the weather and wind patterns will be during the 2025 and 2026 construction periods.

The FAA has determined that short term changes in air traffic procedures of no more than six months to accommodate airport construction do not have a significant effect on the human environment.[6]

Construction Period Landside/Waterside Operations

The construction area would primarily be accessed from the waterside using marine vessels for movement of construction workers and delivery of construction materials. Therefore, the Proposed Project is not anticipated to significantly affect surface transportation traffic patterns in the vicinity of the Airport, nor the number of vehicles accessing the Airport. Marine vessels would be deployed during the two 60-day construction periods.

Construction Period Emissions Inventory

The Proposed Project would not change the operational levels at Logan Airport. Therefore, operational emissions would not change. However, construction is expected to generate short-term construction-related air emissions, including exhaust emissions from on-road construction vehicles, off-road construction equipment and marine vessels; evaporative emissions from asphalt placement and curing;

6 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Section 5-6.5.m., page 5-15, July 16, 2015.

and the generation of fugitive dust from disturbance of unpaved areas. As documented in Section 5.10.3 of the DEIR[7], emissions of air pollutants during construction would meet the *de minimis* standards for General Conformity with the NAAQS.

Based on an estimate of construction equipment and vehicles that are anticipated during the two 60-day construction periods, a maximum of 45 trucks and automobiles and a maximum of 15 marine vessels could be deployed daily. Short-term construction impacts are expected to be limited to the roadways that provide direct access to the Airport's North and South Gates: Service Road (SR-2), Transportation Way, Harborside Drive, and Prescott Street. For trucks and equipment that arrive via roadway, the Coughlin Bypass, Route 1A, and I-90 will facilitate regional connections. As documented in Massport's construction management specifications, construction vehicles are restricted from using local roads.

Project construction would be primarily undertaken from a defined work area. All materials and workers that cannot be delivered by marine vessel would be expected to be delivered to the construction area with via secure escort from either Logan Airport's North or South Gates along Prescott Street or Harborside Drive, respectively. Materials to be delivered by truck to the Airport would primarily include asphalt pavement, concrete, structural steel, granular base and subbase materials, and Engineered Materials Arresting System (EMAS) blocks/materials. Construction workers would be encouraged to take public transportation and not drive or park at the Airport (except for limited supervisory personnel). Most workers would be transported to the site by shuttle bus from a remote contractor lot, via marine vessel, or arrive on existing Airport shuttles.

Appendix E.1, *Air Quality and Noise Supporting Documentation*, contains more detailed data and assumptions used in the construction air quality analysis. **Table 3-2** summarizes the results of the construction emissions inventory for the Proposed Project for each year when construction activity is anticipated to occur (2025 and 2026). For ease of comparison, the applicable General Conformity Rule *de minimis* levels are also shown. As shown, volatile organic compounds (VOC), carbon monoxide (CO), and nitrous oxides (NO_x) Project emissions would be well below the applicable de minimis thresholds. Sulfur dioxide (SO_2), particulate matter smaller than or equal to 10 microns in diameter (PM_{10}), and particulate matter smaller than or equal to 2.5 microns in diameter ($PM_{2.5}$) do not have applicable *de minimis* thresholds because Suffolk County (where the Proposed Project is located) is in attainment for these pollutants. Additional information on specific sources of emissions is show in **Table 3-3**.

Table 3-2 Construction Emissions Inventory (Tons/Year)

	CO	NO_x	VOC	PM_{10}	$PM_{2.5}$	SO_2
2025 Emissions	1.95	13.89	8.27	1.38	0.58	0.01
2026 Emissions	1.49	9.50	2.93	1.13	0.37	0.01
General Conformity *de minimis* Threshold (per year)	*100*	*100*	*50*	*Not Applicable*	*Not Applicable*	*Not Applicable*
Proposed Project *de minimis* Applicability Result (Pass/Fail)	***Pass***	***Pass***	***Pass***	*Not Applicable*	*Not Applicable*	*Not Applicable*

Source: WSP 2022.

7 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, Chapter 5, Impact Assessment, pages 5-56 to 5-58, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Table 3-3 Construction Period Emission Inventory by Source (Tons/Year)

Category				***2025***		
Source	**CO**	**NO_x**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
On Road	0.004	0.101	0.079	0.002	0.002	0.0002
Off Road Equipment (Land + Marine)	0.49	5.19	7.96	0.29	0.28	0.01
Marine Vessels	1.46	8.60	0.23	0.18	0.17	0.01
Fugitive Dust	-	-	-	0.91	0.13	-
Total (2025)	1.95	13.89	8.27	1.38	0.58	0.01
Category				***2026***		
Source	**CO**	**NO_x**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
On Road	0.003	0.076	0.062	0.001	0.001	0.0001
Off Road Equipment (Land + Marine)	0.17	1.65	2.65	0.10	0.10	0.00
Marine Vessels	1.32	7.77	0.21	0.16	0.15	0.01
Fugitive Dust	-	-	-	0.87	0.12	-
Total (2026)	1.49	9.50	2.93	1.13	0.37	0.01

3.3.3 Mitigation Measures

Construction-period air quality mitigation measures include:

- Dust suppression techniques will be implemented to control fugitive dust emission sources and are anticipated to reduce PM_{10} and $PM_{2.5}$ emissions by 75 percent.
- Construction equipment will be maintained according to manufacturers' specifications and operated using USEPA-compliant fuels to minimize emissions.
- Contractors will be required to use Tier III or Tier IV equipment where feasible, limit idling, and implement construction worker vehicle trip management techniques.
- Require that construction contractors use Ultra Low Sulfur Diesel fuel and/or operate vehicles using alternative fuels, where feasible.
- Require contractors use after-engine emissions controls, such as oxidation catalysts or diesel particulate filters, where feasible.

3.4 Biological Resources

The proposed RSA deck will extend into and over Boston Harbor. Boston Harbor is a tidal water body that supports and provides habitat for a variety of biological resources, including marine finfish and shellfish, marine mammals, marine reptiles, and seabirds. The upland airfield also provides grassland habitat for a variety of terrestrial mammals and birds. The proposed safety deck has been designed to minimize temporary and permanent impacts to these resources.

Boston Harbor is subject to regulated resources and habitats. The shoreline and tidal waters support federal, state, and locally regulated resource areas. DEIR Chapters 4 and 5 describe the federal and state regulated resource areas at the Project Site and the regulatory standards and requirements.

3.4.1 Federal Permitting

The RSA deck would extend beyond the Mean High Water Line and High Tide Line (refer to **Figure 3-2**) and therefore, is subject to review pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the federal Clean Water Act. The Project will impact mud flat, a special aquatic site (SAS), with piles and overshadowing by the RSA deck. Permit documents will need to demonstrate compliance with Section 404(b)(1) Guidelines for the work within the SAS.

The Project will impact greater than 1 acre of land area and will need to register with the USEPA National Pollutant Discharge Elimination System (NPDES) program.

3.4.2 Massachusetts and Local Permitting

State and local regulated resource areas are pursuant to the Massachusetts Wetlands Protection Act (WPA) Massachusetts General Law (M.G.L.) Chapter 131, Section 40, and the implementation regulations at 310 CMR 10.00. The Project will require an Order of Conditions from the Boston Conservation Commission that will be reviewed by the Massachusetts Department of Environmental Protection (MassDEP). The regulated resource areas are shown on **Figure 3-2** and described in Chapter 4 of the DEIR (Sections 4.3.2.1 to 4.3.2.7[8]). A discussion of the Project's impacts and the regulatory performance standards are provided in Chapter 5 of the DEIR (Section 5.2.1.2[9]).

The Project will also require a Water Quality Certificate from MassDEP and be subject to the provisions of the Massachusetts Clean Waters Act, M.G.L. Chapter 21 Section 26 to 53 and the implementation regulations 314 CMR 9.00, and Section 401 of the Clean Water Act for placement fill materials or dredging within Waters of the U.S. in the Commonwealth.

The Project will also be subject to the Massachusetts Waterways Program (M.G.L Chapter 91, Sections 1 through 63) - Chapter 91 which regulates activities of all waterways "*including all flowed tidelands and all submerged lands lying below the high water mark…*and *all filled tidelands, except for landlocked tidelands…*" The entire Project Site is within either filled tideland (airfield) or consists of flowed tidelands (shoreline and Boston Harbor) and is subject to licensing and permitting for dredging, filling, and any structures.

A Massachusetts Office of Coastal Zone Management (CZM) federal consistency review will be required for the work within the Massachusetts coastal zone requiring a federal license or permit or that receives federal funding. A draft CZM Consistency Statement for the Project demonstrating compliance with the appropriate enforceable policies is provided in Appendix E.2, *Draft CZM Consistency Statement*.

8 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 4, "Existing Environment," pages 4-7 to 4-19, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

9 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 5, "Impact Assessment," pages 5-6 to 5-16, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

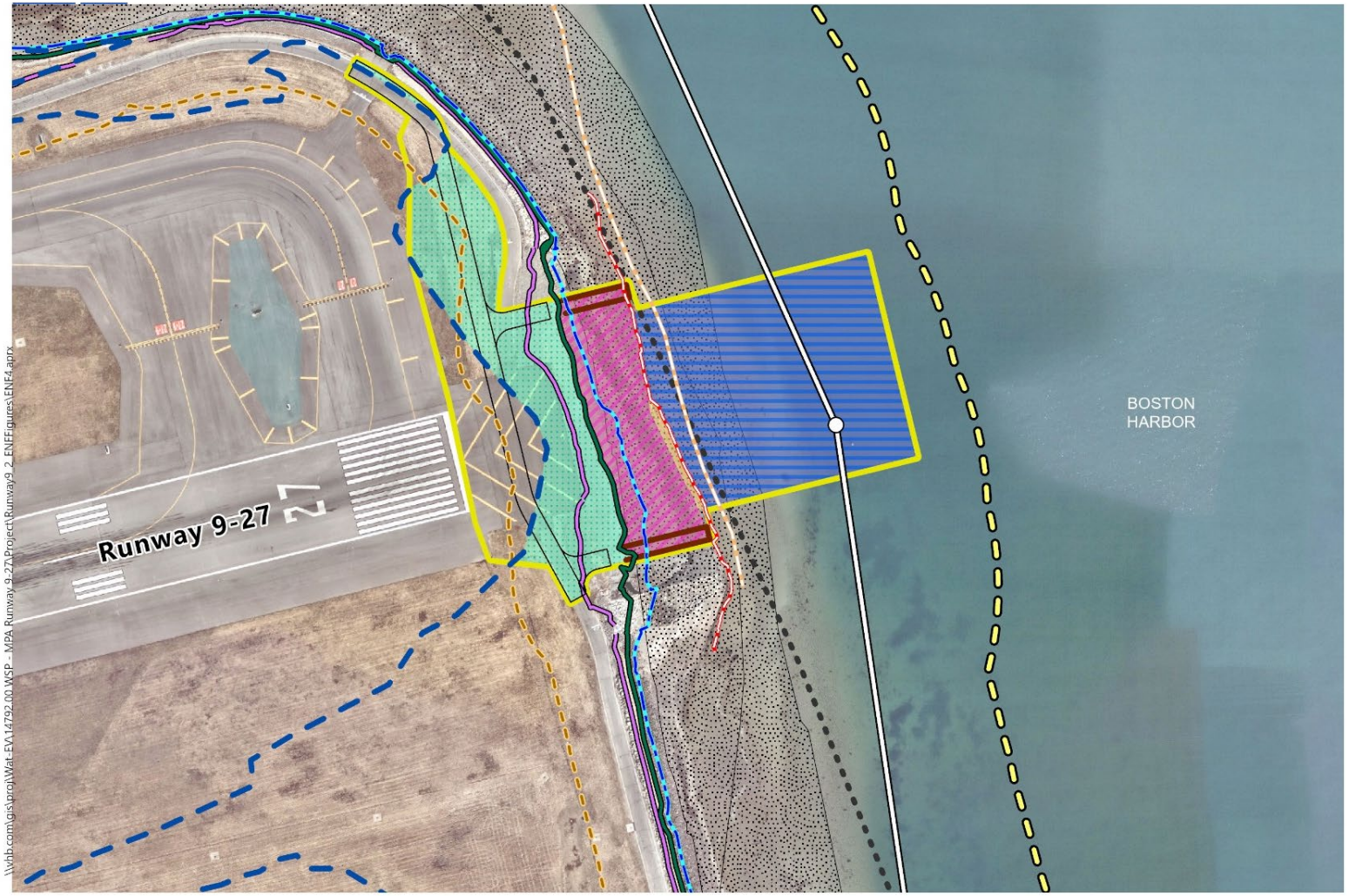


Figure 3-2: Environmental Resource Areas **Runway 27 End RSA Improvements Project**

Proposed Project Site
Proposed Emergency Egress Ramps
Proposed Realigned Airport Perimeter Road
Special Flood Hazard Area (100-Year Flood)
Mean High Water Line
Mean Low Water
Mean Lower Low Water Line
Annual High Tide Line
Coastal Bank Line
100-ft Coastal Beach Buffer
Land Subject to Tidal Action
Coastal Beach
Land Subject to Coastal Storm Flowage
Land Under the Ocean
Land Containing Shellfish
Existing Airport Security Buoy (To Be Relocated)
Logan Airport 250-Foot Inner Security Zone
Legislated Logan Airport 500-Foot Security Zone
Massachusetts Harbor Line (Approximated per Chapter 733 Acts of 1966)

0 100 200 400 Feet

Sources: WSP, VHB, NOAA 2021, FIRM Panel Number 25025C0101J, Effective Date 3/16/2016, Nearmap Imagery March 2022 Massachusetts Bureau of Geographic Information, MassGIS Data: Shellfish Suitability Areas, May 2011.

3.4.2.1 Protected Species

Federally listed threatened and endangered species are managed under the Endangered Species Act (16 U.S.C. Section, 1531 et seq.) and are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) or NOAA Fisheries. The USFWS has determined there are no protected species of concern under their jurisdiction in the Study Area based on comments provided to Massport on April 1, 2021, during early project coordination as part of the Environmental Notification Form (ENF).[10] NOAA Fisheries has informally indicated the Project will not have an adverse impact on protected species within their jurisdiction that may occasionally occur in Boston Harbor in the vicinity of the Proposed Project. These species include three species of federally threatened or endangered sea turtles and five species of whales: loggerhead turtle (*Caretta caretta*), Kemp's Ridley turtle (*Lepidochelys kempi*), leatherback sea turtle (*Dermochelys coriacea*), the federally-endangered North Atlantic right whale (*Eubalaena glacialis*), the federally endangered humpback whale (*Megaptera novaeangliae*), the fin whale (*Balaenoptera physalus*), the sei whale (*Balaenoptera borealis*), and the sperm whale (*Physter macrocephalus*). NOAA Fisheries also indicated the shortnose sturgeon (*Acipenser brevirostrum*) and Atlantic sturgeon (*A. oxyrinchus oxyrinchus)* are species of interest in Boston Harbor (refer to Section 4.7 of DEIR Chapter 4 and Section 5.5 of DEIR Chapter 5).[11] Massport will conduct formal Endangered Species Act Section 7 consultation with NOAA Fisheries during the permitting phase.

Massport will also continue to coordinate with NOAA Fisheries regarding potential impacts to designated Essential Fish Habitat (EFH) in the vicinity of the Project. The NOAA EFH Mapper database was consulted and identified 27 species within Boston Harbor that benefit from the harbor for one or more life stages (refer to Section 4.6.2 of DEIR Chapter 4[12]). Boston Harbor is also designated as a Habitat Area of Particular Concern (HAPC) for Inshore (0 to 20 meters from the Mean Low Water (MLW) line) juvenile Atlantic cod.

Two upland grassland State-listed bird species, the upland sandpiper (*Bartramia longicauda*) and Eastern meadowlark (*Sturnella magna*), are present on the Project Site. Massport will continue to coordinate with the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Protected grassland habitat will be altered and Massport will work with NHESP to develop suitable mitigation. It is Massport's goal to avoid impacts to an individual or habitat that would constitute a "take" that would require a Conservation and Management Permit.

3.4.3 Affected Environment

The proposed RSA deck will extend into and over Boston Harbor which is an estuary that provides intertidal and subtidal aquatic biological resources. These biological resources provide habitat for finfish, shellfish, marine invertebrates, marine mammals, marine reptiles, and seabirds. The upland grasslands between the runways and taxiways on the airfield within the Project limits also offer habitat for a variety of terrestrial small mammals and birds.

10 Massachusetts Port Authority, Environmental Notification Form, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Attachment C, "Agency Coordination," August 31, 2021, https://www.massport.com/media/4xdlv5rz/9-27-enf_compiled_final_083021.pdf.

11 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

12 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 4, "Existing Environment," pages 4-27 to 4-28, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

The primary impact to marine biological resources consists of installing concrete piles to support the RSA deck and the shading of coastal resources from the deck. The resources that will be affected by the Project include the shoreline intertidal and subtidal areas. The intertidal shoreline from Annual High Water (AHW) to MLW at the end of Runway 27 is characterized as a crushed rock stabilized slope constructed in 1992 as an Inclined Safety Area (ISA). While salt marsh was identified along the shoreline to the northwest outside of the Project Site, no salt marsh is present within the footprint of the Project Site and no impacts to salt marsh would be anticipated during construction or project implementation. The upper portion of the coarse rock slope does not offer much habitat and is generally unvegetated. The lower end of the slope between Mean High Water (MHW) and MLW is submerged for longer periods during the tidal cycle and provides some habitat for barnacles (*Balanus* sp.), common periwinkle snails (*Litterina littorea*), and a narrow band of blue mussels (*Mytilus edulis*) established between the rocks.

Below the stone slope at MLW and seaward, the substrate is gently sloping gray/brown muddy sand or sandy mud substrate. During monthly low tides, the mud flat that is temporarily exposed can be up to 100 feet wide. The extent of mud flat from the lower edge of the stone stabilized shoreline to Mean Lower Low Water (MLLW) is about 35 feet and is approximately 11,820 square feet. The full extent of exposed mud flat could be as much as 37,210 square feet within the Project area at the yearly extreme low tide.

The sandy flat area below MLW provides habitat for a variety of intertidal and subtidal invertebrate species such as bivalves, polychaetes, crustaceans, and snails. Commercially important soft shell clams (*Mya arenaria*), razor clams (*Ensis directus*), and surf clams (*Spisula solidissima*) were observed within the intertidal flat in the Project Site although density of individuals was very low. When the tide is out and the mud flat is exposed, the site provides foraging opportunity for shorebirds, gulls, and ducks on polychaetes, small crustaceans, and bivalves. When the tide is in, and the area is inundated, the mud flat provides potential feeding opportunities for fish, and larger crustaceans like crabs (*Cancer* spp.) and lobster (*Homarus americanus*) on the same polychaetes and small crustaceans.

Beyond extreme low water, the gently sloping substrate drops steeply from -8 feet to -17 feet in about 50 feet. Then seabed slopes gently down again toward the center of the channel to a maximum depth of about -23 feet. Based on field survey, the seabed substrate is sandy mud with occasional clumps of European oyster (*Ostrea edulis*) or isolated cobble rocks colonized by sugar kelp (*Laminaria saccharina*) and tunicates (*Styela* sp. and *Botyllus* sp.). The oysters and occasional cobbles did not appear to be embedded in the substrate and are likely occasionally relocated by tides and storm events. No aquatic bed vegetation, such as eelgrass (*Zostera marina*), is present in the Study Area based on an undersea survey.

The proposed RSA deck will be supported by concrete piles driven into the seabed. The footprint of the piles will directly impact the seabed during installation (pile driving and vibrations) and from the loss of a small area of intertidal and subtidal seabed. The proposed deck will overshadow a portion of the Coastal Beach and Land Under the Ocean also regulated by U.S. Army Corps of Engineers (USACE).

Part of the Project will include work on the upland portions of the Project Site and will impact grassland habitat. Grass infield between the runways, taxiways, and perimeter road will be altered by relocation of the perimeter road and widening the paved portion of the runway shoulder. The perimeter roadway will be relocated to the west to create a safer more perpendicular intersection with the runway end. The new perimeter roadway location will impact existing grassland within the NHESP polygon for upland sandpiper (*Bartramia longicauda*) and Eastern meadowlark (*Sturnella magna*). Additional grassland between the new roadway and the existing roadway will be converted to a stone surface.

3.4.4 Environmental Consequences

3.4.4.1 Direct Impacts

In the No Action Alternative, there would be no change to the Runway 27 End. Biological resources and coastal habitats would not be altered or impacted and would remain as existing. There would also be no impacts to threatened or endangered species or their habitats from the No Action Alternative.

The Proposed Action would include placing a pile-supported RSA deck within Boston Harbor, and placing fill for the emergency egress ramps, and minor dredging to install the lower ends of the ramps. The proposed work (structures, fill, dredging) will be within regulated resource areas (**Figure 3-3**) and subject to review and permitting by federal, state, and local agencies. **Table 3-4** provides the impact areas for each federal and state regulated resource areas. Note, some of the state resource areas are overlap.

Table 3-4 Runway 27 End RSA Direct Impacts to Coastal Wetland Resources – Proposed Project

		Impacts			
Wetland Resource Area	**Jurisdiction**	**RSA Deck (shading)**	**Piles (Number/Area [1])**	**Emergency Access Ramps**	**Total [2]**
Land Under the Ocean	**Local and State**	107,700 sf	246 / 690 sf	0	107,700 sf
Coastal Beach	**Local and State**	2,170 sf	6 / 20 sf	490 sf	2,660 sf
Coastal Banks	**Local and State**	310 lf	N/A	80 lf	390 lf
Salt Marsh	**Local and State**	0	0	0	0
Land Containing Shellfish	**Local and State**	58,130 sf	124 / 350 sf	8,630 sf	66,760 sf
Land Subject to Tidal Action	**Local and State**	35,960 sf	70 / 200 sf	9,460 sf	45,420 sf[3]
Land Subject to Coastal Storm Flowage	**Local and State**	92,000 sf	10 / 30 sf	5,200 sf	97,200 sf
Land Below Annual High Tide	**Federal**	143,660 sf	316 / 880 sf	9,460 sf	153,120 sf
Mud Flat[4] (Special Aquatic Site)	**Federal**	11,820 sf	30 / 85 sf	490 sf	12,310 sf

All square footages are approximate values as they have been rounded to the nearest value of ten (most values were rounded up).
1 Each 20-inch square pile is 2.78 square feet. Direct impact of all 326 piles is 906 square feet.
2 Area of impact under the RSA Deck or area of upland. Area of piles or approach slab not included, since included in the overall deck area.
3 Includes 1,230 square feet for RSA Deck approach slab.
4 Mud Flat extends from lower edge of stone shoreline to MLLW (Elev. -5.51 feet).
lf = linear feet
sf = square feet
N/A = Not Applicable

The Proposed Project is anticipated to have a minimal effect on coastal biological resources. Most of the area under the proposed RSA deck would continue to function for marine fisheries and wildlife habitat. Modeling of the proposed piles has indicated that they would not adversely affect the surrounding water column. The piles would provide a new solid surface area for attachment for encrusting organisms and algae. Although shadowed, the benthic environment would continue to function as before since the habitat would continue to be subject to the ebb and flood of the tides. The food sources for most benthic invertebrates such as phyto- or zooplankton or detritus would continue to be flushed in by the tidal waters. Fish and other more mobile aquatic species would continue to access under the deck to feed, rest,

or escape. The arrangement of piles would not restrict the movement of tidal waters and would not lead to a stagnated water condition that could degrade the habitat. In addition, the deck piles are not anticipated to cause elevated current velocity or tidal wave action and would not increase erosion or accretion of the seabed[13] or other changes to habitat. These findings are consistent with the observations following construction of the adjacent Runway 33L RSA deck.

FAA Order 1050.1F defines a significant impact for listed species as one when the USFWS or NOAA Fisheries determines a proposed action would likely jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. As documented in this section, the DEIR (refer to Section 4.7 of DEIR Chapter 4 and Section 5.5 of DEIR Chapter 5),[14] and Appendix C, *Agency Correspondence*, it is anticipated that the proposed Runway 27 End RSA Improvements would have an effect, but not an adverse effect, on the habitat of protected species. Pursuant to Section 7 of the Endangered Species Act, the proposed pile-supported deck is not likely to jeopardize the existence of protected species or adversely change their habitat in Boston Harbor. The Project would be constructed in an area that is generally too shallow for whale species, including North Atlantic right, humpback, fin, sei, and sperm whales. No direct impact to listed species that NOAA Fisheries identified as occasional occurring in Boston Harbor in the vicinity of the Proposed Project is anticipated. NOAA Fisheries provided preliminary concurrence at a meeting on June 23, 2022 (see Appendix C, *Agency Coordination*), that the proposed safety improvements would not result in an adverse effect on protected species, including fish species, sea turtles, or marine mammals. Massport will continue coordination with NOAA Fisheries through a formal Section 7 Consultation during the permitting phase of the Project. Massport will also continue to coordinate with NOAA Fisheries regarding potential impacts to designated EFH in the vicinity of the Project.

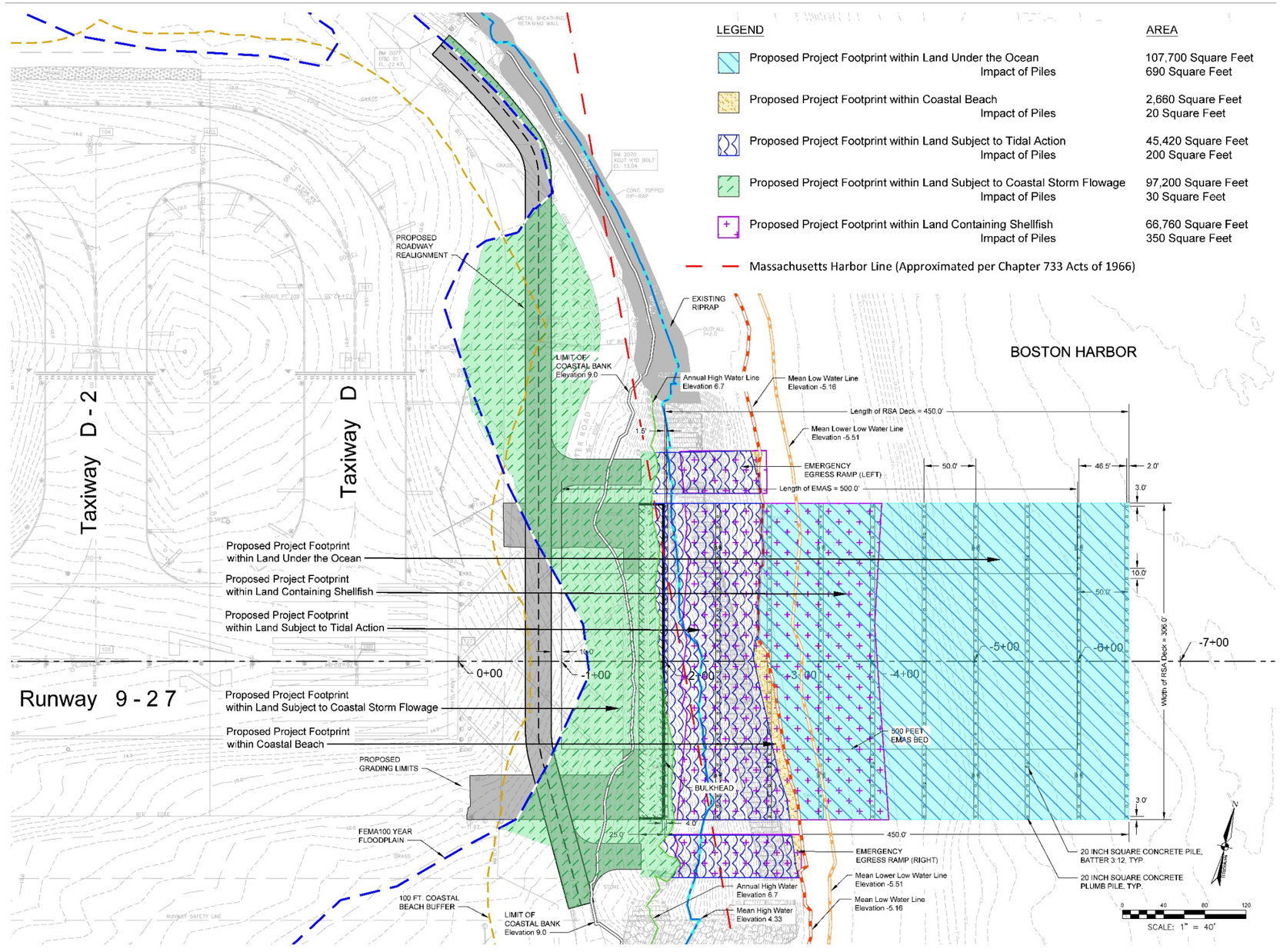
Construction activities associated with the Project could cause some temporary disturbance if these activities were to take place with protected species present; therefore, pursuant to Section 7 of the Endangered Species Act, the construction of the Proposed Action may affect, but is not likely to adversely affect protected species. Temporary pile-driving activities may generate underwater noise levels that could potentially harm marine species. Construction activity could cause marine species to temporarily avoid the work area and therefore avoid potential adverse impacts of sedimentation and noise. Construction is anticipated to occur for two 60-day periods between July and October in 2025 and 2026 (for a total of 120 days). See Section 3.11.2, Noise and Noise-Compatible Land Use, for more information.

Associated work in the adjacent upland on the airfield will alter existing grassland habitat, including a state-listed polygon of priority habitat for two upland grassland bird species: upland sandpiper and Eastern meadowlark. Grassland habitat will be both temporarily and permanently altered by the Project. The existing airport perimeter road will be relocated and the runway shoulder will be widened south of the runway into areas of existing grassland habitat. Approximately 20,300 square feet of grassland habitat will be permanently altered by the Project. An additional 22,000 square feet of grassland will be temporarily altered for construction laydown, material storage, and equipment operations.

13 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Appendix D.4, "Coastal Analysis," June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

14 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Figure 3-3 Coastal Resources Located within the Project Site



This Page Intentionally Left Blank

Indirect Impacts

Indirect effects to protected marine species, if present, could include effects on population persistence or stability due to changes of food sources, and could include health effects due to water quality (turbidity) and underwater construction noise. Measures to limit indirect impacts are discussed in the next section.

3.4.5 Mitigation Measures

Massport will include measures to mitigate the Project impacts by preventing, limiting, and minimizing impact to adjacent resources.

Early coordination with the Massachusetts Division of Marine Fisheries (DMF) and NOAA Fisheries has identified an in-water time-of-year (TOY) restriction for silt producing construction activities of February 15 to June 30 of any year to protect spawning winter flounder. Massport accepts this restriction and will condition any in-water construction activities to avoid this time period. In addition to the TOY restriction, turbidity curtains will be used to surround the in-water work area to contain any turbidity that may be created by the construction activities. The turbidity curtains will be plastic coated fabric with floats on the top edge and weights on the bottom to rest on the seabed and will be placed to encircle the in-water construction activities.

During construction, erosion controls will be installed at the limit of the work area. The erosion controls will provide a visual boundary of the work area for the contractor and will prevent release of sediment from the work area that may be mobilized by the construction. An erosion control plan will be prepared and included in the permit applications for review by the appropriate regulatory agencies.

Between the deck piles and the emergency egress ramps, approximately 1,200 square feet of seabed or mud flat will be directly impacted and lost. Massport has committed to provide replacement/restoration of soft bottom intertidal and subtidal habitat to offset Project related loss of habitat. A plan for replacement of the intertidal and subtidal area impacted by the Project will be included in the future permit applications. The mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts.

As discussed above, approximately 1 acre of grassland habitat will be temporarily or permanently altered by the Project. Approximately 20,300 square feet of grassland habitat will be permanently impacted by the Project. An additional 22,000 square feet of grassland will be temporarily altered for construction laydown, material storage, and equipment operations. Massport will work with the NHESP to identify suitable locations within the airfield where existing pavement can be removed within the rare species polygon to create new grassland habitat to offset the impact from the Project. The temporarily altered grassland habitat will be restored in place using an NHESP-approved seed mix.

Impacts to shellfish resources have been discussed with the DMF along with potential mitigation measures. The field survey for shellfish demonstrated the presence of only minimal shellfish. DMF has stated that the collecting and relocating the soft shell clams was not warranted for this Project. Consistent with prior projects at Logan Airport, DMF has suggested Massport contribute funds to their Boston Harbor shellfish restoration program. Funding would be determined during the permitting phase of the

Project. Providing a copy of the state wetland Notice of Intent to the DMF is a filing requirement and a contribution to the restoration fund will be a condition of any Order of Conditions.

The Project will require a permit from the USACE for work in Section 10 and 404 waters. Although USACE staff attended interagency coordination meetings on the Project, there were no specific discussions regarding mitigation. Based on USACE Compensatory Mitigation Guidance and other recent projects permitted by the USACE, they prefer to use the in-lieu fee program to offset impacts to wetland resources. Once an application for the Project is submitted to the USACE, Massport will discuss the value of the in-lieu fee payment to offset the direct impact of the Project. The in-lieu fee payment to the USACE is estimated to be approximately $17,200.

Noise during construction will be a temporary impact, primarily from pile driving. Measures to mitigate both above and below water noise will include using a vibratory pile driver as much as possible, using a ramp up or soft start for hammer driving and padding on top of the pile to lessen the sound. Soft start pile driving will use reduced hammer energy at the start of the driving to make less noise but will help to scare fish and marine animals away from the work area before gradually increasing the force.

3.5 Climate (including GHG emissions)

The following section examines state and federal policy for determining the Project's susceptibility to climate exposures for both the Proposed Project and No Action Alternatives. This includes discussion of greenhouse gas (GHG) emissions. The following section builds on an updated version of the Resilient Massachusetts Action Team (RMAT) output report first introduced in the DEIR (see Appendix E.3, *RMAT Output Report*).

3.5.1 GHG Emissions

The CAA regulates the GHG emission from on-road surface transportation and other Executive Orders direct projects to reduce GHG emissions from direct and indirect sources.[15] In addition, the EEA has developed the Massachusetts Environmental Policy Act (MEPA) GHG Policy M.G.L. Chapter 30, Section 61), which requires project proponents to identify and describe feasible measures to minimize both mobile and stationary-source GHG emissions generated by the proposed project. While GHGs include several air pollutants, the MEPA GHG Policy calls for the evaluation of carbon dioxide (CO_2) emissions because CO_2 is the predominant human-caused contributor to global warming. The MEPA GHG Policy states that projects undergoing MEPA reviewing requiring an EIR must quantify the project's GHG emissions and identify measures to avoid, minimize, or mitigate emissions. The MEPA GHG policy contains a *de minimis* exemption for projects that require an EIR and would have few to no GHG emissions. As such, the Proposed Project would be expected to fall under the *de minimis* exemption, as described in the ENF and the associated ENF Certificate, however as directed by the Secretary's Certificate on the DEIR, a GHG emission inventory by source was conducted for this submission and is included in Section 3.5.3.2.

15 U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, *1050.1F Desk Reference*, Version 2, February 2020.

3.5.1.1 Climate Change

Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, establishes climate considerations as an essential element of U.S. foreign policy and national security, emphasizes achieving significant global emission reductions, and directs each federal agency to develop a plan to increase the resilience of its facilities and operations to the impacts of climate change, amongst other initiatives.[16]

Massachusetts Executive Order 569, *Establishing an Integrated Climate Change Strategy for the Commonwealth*, was issued on September 16, 2016. Executive Order 569 recognizes the serious threat presented by climate change and directs Massachusetts Executive Branch agencies to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) was issued on September 17, 2018, in fulfillment of Massachusetts Executive Order 569. The SHMCAP integrates climate change impacts and adaptation strategies with hazard mitigation planning and includes specific actions for each Executive Branch agency. The SHMCAP led to the creation of the inter-agency RMAT, which is tasked with monitoring and tracking the SHMCAP implementation process, making recommendations to and supporting agencies on plan updates, and facilitating coordination across state government and with stakeholders. As of October 1, 2021, the *MEPA Interim Protocol on Climate Change Adaptation and Resiliency* (Interim Protocol) requires all new projects filing with the MEPA Office to print the output report generated from the RMAT Climate Resilience Design Standards Tool and submit it as an attachment. This output is included as Appendix E.3, *RMAT Output Report*.

3.5.2 Affected Environment

3.5.2.1 GHG Emissions

In the mid-2000s, Massport began calculating and reporting its operational GHG emissions and has continued to do so in alignment with evolving regulatory requirements for GHG disclosure and management, including the Commonwealth's Global Warming Solutions Act of 2008. Total emissions for Logan Airport in 2019 (inclusive of Scopes 1, 2, and 3 emissions) were estimated to be 808,125 metric tons of carbon dioxide equivalents (CO_2e), which represents approximately one percent of statewide totals.

3.5.2.2 Climate Change

As described in the ENF, facilities in the Boston area and along the Massachusetts coastline are increasingly susceptible to flooding hazards caused by extreme storms and rising sea levels because of climate change. Since 2014, Massport has incorporated floodproofing design guidelines into its capital planning and real estate development processes to make its infrastructure and operations more resilient to these anticipated flooding threats. The Massachusetts Coastal Flood Risk Model is used to assess potential flooding vulnerabilities for Massport projects along the coastline. In 2020, Massport performed a safety rehabilitation of Runway 9-27 to enhance the surface of the runway. As part of that effort, and with the knowledge that some type of improvement to the Runway 27 End RSA may be upcoming, the runway threshold was raised 10 inches from its existing elevation. The 10-inch adjustment was made to account for any potential safety area construction extending out into Boston Harbor, sea level rise, and to

16 The White House, Executive Office of the President, Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, 86 Federal Register 7619, January 27, 2021.

protect the runway from flooding due to increased precipitation. The rise in elevation was conducted within design guidelines set by the *Massport Floodproofing Design Guide*, which was implemented in 2014.[17] The rise in elevation was made to the maximum extent practicable in relation to the remainder of the airfield. The FAA has set criteria and requirements in relation to grade change. The implemented rise in elevation results in a RSA deck at the Runway 27 End which would be higher than the Runway 4R light pier and Runway 33L RSA deck, and the maximum feasible height.

3.5.3 Environmental Consequences

3.5.3.1 GHG Emissions

No new impacts to climate would occur under the No Action Alternative. The No Action Alternative would not be any more susceptible to climate hazards or emitting more GHG than existing conditions.

While this safety project will not change emissions at Logan Airport, the MEPA GHG Protocol requires discussion of project-related GHG emissions. No airfield operational changes are anticipated as part of this Project, and therefore there would be no changes or direct impacts to operational GHG emissions. Short-term construction-period increases in GHG emissions would occur due to construction activities as described in Section 3.3, Air Quality. As requested by the Secretary's Certificate on the DEIR, a GHG emission inventory by source was conducted for this submission and is summarized in **Table 3-5**.

Based on a preliminary estimate of construction equipment and vehicles that are anticipated during the two 60-day construction periods, a maximum of 45 trucks and automobiles and a maximum of 15 marine vessels could be deployed daily.

Table 3-5 Construction-Period GHG Emissions Inventory by Source (Tons CO_2/Year)

Source/Year	2025	2026
On Road	48	37
Off Road Equipment (Land and Marine)	2,845	1,125
Marine Vessels	649	586
Total	3,542	1,748

Source: WSP, May 2022.

3.5.3.2 Adaptation and Resiliency

Based on the RMAT Climate Resilience Design Standards Tool Output Report, the Project is identified as having a high initial risk rating due to exposure to sea level rise/storm surge, extreme precipitation due to urban flooding, and extreme heat (see Appendix E.3, *RMAT Output Report*). The RSA deck will have a 75-year design life. The proposed RSA is required by the FAA and would be constructed partially on land and partially on a deck over Boston Harbor. In 2020, Massport raised the Runway 27 threshold by 10 inches to account for sea level rise and has an airport wide flood management program in place that is continuously enhanced to improve resiliency. The RMAT Output Report included projected impacts from

17 Massachusetts Port Authority, *Massport Floodproofing Design Guide*, November 2014, revised November 2018, https://www.massport.com/media/2xacmacm/massport-floodproofing-design-guide-revised-november-2018.pdf.

sea level rise and storm surge through the 2050 and 2070 planning horizon. The projected sea level rise for both these planning horizons, as per the Secretary's Certificate are summarized in **Table 3-6**.

Table 3-6 RMAT Sea Level Rise Projections for 2050 and 2070 Planning Horizons (feet, NAVD 1988)

Measure	Current	2050	2070
Mean Low Water	-5.16	-2.3	-0.7
Mean High Water	4.3	7.3	9.2
Water Surface Elevation	5.51	12.5	14.3
Wave Action Elevation	9.49	13.6	15.9

Current values from NOAA, *Tide Predictions; Datum for 8443970, Boston, MA*, https://tidesandcurrents.noaa.gov/datums.html?id=8443970.
Projected values from the RMAT Output Report, see Appendix E.3 for further methodology.

As demonstrated in **Table 3-6**, over the course of the Project's useful life, according to the RMAT model, sea level rise will impact the Project Area as it will be more susceptible to flooding during high tide or storm events. Increase flood risk is demonstrated by the increase in all metrics illustrated in **Table 3-6**. Illustrated in Appendix E.3, *RMAT Output Report*, the increase in water surface elevation would result in the approximately three quarters of the land beneath the deck being submerged by 2050 and the entirety of land beneath the deck submerged by 2070.[18] As indicated by the RMAT Output Report, the Project Site is anticipated to experience increasing precipitation over the Project's useful life. Through the 2070 planning horizon, projected 24-hour total precipitation is projected to reach 9.4 inches. Due to the FAA's design guidelines, the maximum elevation above Mean Sea Level of the RSA is tied directly to existing runway and taxiway elevations. Its runway-end position cannot be adjusted beyond the FAA design specifications. Based on FAA safety requirements, the project design will not be able to meet the RMAT design recommendations, however, Massport has an airport-flood management program in place, and continually enhances the program to improve resiliency of Airport assets in the future.

Massport recognizes that some assets may be inundated by flooding or excessive precipitation for certain short-term periods and has worked to floodproof light vaults and other features, and to identify operational changes to runways and taxiways to accommodate drying out before being returned to service. In 2020, Massport raised the Runway 27 threshold by 10 inches to account for sea level rise and has an airport wide flood management program in place that is continuously enhanced to improve resiliency. As part of that project, Massport also improved the drainage system. In the unlikely event that the deck flooded, portions of the runway and adjacent airfield would also be flooded; in this situation, Runway 9-27 would be taken out of service until safe operation could resume. The RSA would not be occupied other than for periodic maintenance or in the event of an aviation emergency. Massport has in place an active resiliency program, including implementing the *Massport Floodproofing Design Guide*, sustainability policy, and is undertaking developing a Climate Action Plan for the Authority including a net zero GHG emissions roadmap.

The new pavement areas will be allowed to sheet flow onto adjacent grassed or crushed stone surfaces. Water will be allowed to infiltrate in these pervious areas or may runoff overland to Boston Harbor. A stormwater collection system of scuppers along the sides of the RSA deck will be sized to collect flows from the 10-year storm event.

18 These approximations are illustrated on pages 8 and 9 of Appendix E.3, *RMAT Output Report.*

Indirect Impacts

Designing the Project to withstand anticipated climate changes would result in positive impacts to safety and mobility, as the RSA would sustain fewer damages and service interruptions over time. Failing to design the Project in line with future climate projections has the potential to increase its climate risk, which could have negative implications to Logan Airport's larger stormwater system.

3.5.4 Mitigation Measures

As stated in Chapter 2, *Proposed Action and Alternatives*, Section 2.3.2 (page 2-6), the deck substructure would be designed to withstand anticipated coastal storm events and sea level rise. In addition, the proposed RSA deck concrete and EMAS blocks would be light gray, reducing their contribution to temperature increase.

The construction-period air quality mitigation described in Section 3.3, Air Quality, when deployed would also result in reduce GHG emissions.

In addition to project-specific mitigation, Massport is embarking on implementing a roadmap that strives to achieve net zero GHG by Massport operations (including Logan Airport) by 2031, for those activities under its control. Additional information on Massport's net zero GHG emissions commitments can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

3.6 Coastal Resources

The proposed safety project is within the Massachusetts Coastal Zone (Boston Harbor) region. The Project will be partially funded by the FAA and will require a Section 10/404 permit from the USACE. The USACE authorization would require an approved Coastal Zone Management Consistency Statement from the CZM program demonstrating the Proposed Project is consistent with the approved Massachusetts Coastal Zone Management Program and program policies. Massport believes that the proposed Runway 27 End RSA Improvements Project can be designed and constructed to be consistent with the CZM Program and program policies as set forth in 301 CMR 20.00.

The proposed activity complies with the program policies of the Massachusetts approved coastal management program and will be conducted in a manner consistent with such policies.

The Massachusetts Office of CZM implements the state's coastal program under the federal Coastal Zone Management Act (CZMA) of 1972. The CZM reviews federal projects to ensure they meet state standards articulated in the Massachusetts Coastal Zone Management Plan through a process called federal consistency review. The federal consistency review requirement of the CZMA holds that federal actions that have reasonably foreseeable effects on any land or water use or natural resources of a state coastal zone must be consistent with the enforceable policies of the federally approved coastal management program for that state. Federal consistency review is required for most projects that:

1. Are in or can reasonably be expected to affect a use or resource of the Massachusetts coastal zone, and/or
2. Require certain federal licenses or permits, receive certain federal funds, are a direct action of a federal agency, or are part of outer continental shelf plans for exploration, development, and production.

For the DEIR, Massport prepared a federal consistency review for CZM in accordance with Title 301 of the Code of Massachusetts Regulations (CMR) 20.00, Coastal Zone Management Program. An updated consistency review is included in Appendix E.2, *Draft CZM Consistency Statement*, in compliance with federal review requirements.

3.6.1 Waterways

Logan Airport is surrounded on three sides by Boston Harbor. Massachusetts General Law Chapter 91 protects the public's interest in the waterways of the Commonwealth. Chapter 91 does not apply to any of the previously filled tidelands within the geographical boundary of Logan Airport (310 CMR 9.03(3)); only tidelands located below the high tide line are subject to Chapter 91 jurisdiction at the Airport. A discussion of the provisions of Chapter 91 is provided in Section 4.5.1.3 of DEIR Chapter 4, *Existing Environment*.[19] The Project is also subject to compliance with the state's CZM Plan. A draft CZM consistency statement has been prepared and is included in Appendix E.2.

Within Boston Harbor and around the shoreline of Logan Airport are State Harbor Lines. The lines were established by the legislature to set a limit for filling or structures to preserve the public benefit of the state's navigable waters. Information recently provided by the MassDEP Waterway Program staff included a 1970 Waterways permit that illustrated the current harbor lines and the Acts and Resolves of the Massachusetts General Court from 1966 with a description of the harbor line locations. This information was used to illustrate the harbor lines on the Project plans and figures. The harbor lines were revised in 1966[20] around the shoreline of Runway 27. The revised harbor line in proximity to the Project is illustrated on **Figures 3-1** (pg. 3-8), **3-2** (pg. 3-14), and **3-3** (pg. 3-19). The proposed RSA deck will extend beyond the existing State Harbor Line by approximately 460 feet. The enabling legislation for Logan Airport (Chapter 465 of the Acts of 1956)[21] contains broad authorization for Massport to utilize adjacent underwater areas for airport purposes should that need arise in the future:

> *The commonwealth hereby consents to the use of all lands owned by it, including lands lying under water, which are deemed by the Authority to be necessary for the construction and operation of any project…*

3.6.2 Affected Environment

A detailed description of coastal and water resources in the Proposed Project Study Area is in included in Section 3.4.3, Biological Resources Affected Environment.

19 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 4, "Existing Environment," page 4-26, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

20 Acts and Resolves of Passed by the General Court of Massachusetts, 1966.

21 Massachusetts Port Authority Enabling Act, Chapter 465 of the Acts of 1956, Section 4, Paragraph 6.

3.6.3 Environmental Consequences

No new impacts to coastal zone resources would occur under the No Action Alternative. The following discusses the environmental consequences of the Proposed Project.

- **Flood Control.** The proposed Runway 27 End RSA Improvements Project would not affect the flood control or storm damage prevention functions of the coastal bank at the Runway 27 End. The Project would not have any effect on the stability of the existing human-made shoreline. The existing placed stone and riprap shoreline stabilization north and south of the Project Site contribute to the stability of the shoreline and together with the proposed improvements, would continue to contribute to the prevention of storm damage and flooding.
- **Coastal Processes.** To minimize coastal resource impacts, the proposed RSA improvements will feature a pile-supported deck structure at the Runway 27 End rather than a solid fill structure. Modeling for the DEIR demonstrates that the deck supports may have minor, localized changes to coastal processes in the immediate project area. Currents in the vicinity of the deck would not be significantly altered and only negligible erosion may occur at the pilings. The two proposed emergency access ramps are solid fill structures, but these structures would not affect coastal processes. The proposed ramps would be constructed primarily within the existing crushed rock ISA. The crushed rock area surrounding the proposed ramps is designed not to be easily erodible or transportable material and it has remained stable for nearly 30 years. Impacts would be localized and generally affect the area under the deck and along the immediately adjacent shoreline. The Project Site is not a source or fine-grained sediment that could erode or be transported to replenish nearby beaches.
- **Sediment Transport.** Based on the coastal modeling results, the Project would not result in any appreciable changes to the movement of sediments at the Project Site, and none anticipated for Snake Island, or the Cottage Park or Winthrop Yacht Clubs, as described in DEIR Section 5.2.2.1 and DEIR Appendix D.4.[22]
- **Wetland Resources.** At the Runway 27 End, there are no salt marshes, dunes, barrier beaches, salt ponds, known submerged aquatics, or freshwater wetlands. The resources present at the Runway 27 End are shellfish beds supporting soft shell clams (*Mya arenaria*), razor clams (*Ensis directus*), surf clams (*Spisula solidissima*) and blue mussel (*Mytilus edulis*). Of about 58,130 square feet of Land Containing Shellfish, the proposed pile driving would unavoidably impact approximately 350 square feet, or less than one percent, of the available habitat (**Figure E.2-4** in Appendix E.2, *Draft CZM Consistency Statement*). The proposed emergency egress ramps would impact an additional 490 square feet of suitable shellfish muddy sand habitat. Impacts to mussel beds are approximately 900 square feet of direct impact from construction of the emergency egress ramp on the north side of the RSA deck and shading to approximately 1,460 square feet of the northern mussel bed and the small cluster of mussels near the center of the RSA deck. The mussels on the south side of the RSA deck would not be impacted.
- **Upland Habitat.** The Runway 27 End RSA Improvements Project would also impact upland grassland habitat for upland sandpiper (*Bartramia longicauda*) and Eastern meadowlark (*Sturnella magna*) (**Figure E.2-5** in Appendix E.2, *Draft CZM Consistency Statement*); species that are state-listed as endangered or species of special concern, respectively. Approximately

22 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 5, *Impact Assessment*, page 5-18 and Appendix D.4, "Coastal Analysis," June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

20,300 square feet of grassland would be lost primarily from the realignment of the perimeter roadway (refer to **Figure E.2-4** in Appendix E.2, *CZM Consistency*). The impacts to shellfish beds or upland grassland habitat will not compromise the ability of the coastal area to provide critical wildlife habitat functions, nutrient and sediment attenuation, wave and storm damage protection, or landform movement and processes. With the proposed mitigations, there are no anticipated permanent impacts to wildlife.

- **Public Access.** The Project Site includes Logan Airport property on the secured airfield in an area where public access in the coastal zone is restricted and highly regulated. The waterfront adjacent to the Project Site is not available for water dependent or vessel related activities development. The Logan Airport Security Zone extends 500 feet seaward of and parallel to the MHW line at Logan Airport.[23] With extremely limited exceptions and subject in all events to Massport's oversight and permission, public access is not permitted within the Logan Airport Security Zone.
- **Water Quality.** The Project would increase impervious area and increase stormwater runoff discharged to Boston Harbor. The Project will comply with the applicable Massachusetts Stormwater Management Standards. A discussion of the potential stormwater management measures is provided in Section 3.14.4.

3.6.4 Mitigation Measures

A new sheet steel bulkhead at the landward edge of the RSA deck at the top of the coastal bank would help stabilize the shoreline and prevent erosion. The proposed pile-supported deck at the Runway 27 End has been designed to withstand flood and storm related damage as it would be elevated above the annual high tide line thereby diminishing damage from erosion. The emergency access ramps would be stable structures reinforced by riprap.

The proposed Runway 27 End RSA Improvements Project would have unavoidable impacts to shellfish beds present at the runway end. Massport will work with DMF and USACE during Project permitting to mitigate for these unavoidable impacts.

Massport would plan to offset any reductions in this grassland habitat by removing excess pavement on the airfield and reestablishing those areas with a grass mix approved by the U.S. Department of Agriculture (USDA) and NHESP.

Massport is committed to working with MassDEP during Project permitting to mitigate for any stormwater impacts. Although the final design has not been prepared, a preliminary discussion of the compliance with the Massachusetts Stormwater Management Standards is provided in Section 3.14.4, Mitigation Measures.

3.6.5 Massachusetts Public Benefits Determination

The Public Benefits Determination Regulations (310 CMR 13.00) establish a procedure for the Secretary of the EEA to ensure that public benefits are protected and/or provided by non-water-dependent projects within tidelands, pursuant to the authority granted under M.G.L. c. 91, Section 18B. The regulations provide that the public benefit determination will not in any way impair DEP's exercise of its powers

23 Massachusetts General Law, Chapter 90, Section 61(a).

under Chapter 91 and that MassDEP will incorporate the public benefit determination into the official record of the Chapter 91 decision.

The Secretary requires a mandatory public benefit review is conducted for the Project following procedures within 310 CMR 13.03. The Project would result in a positive Public Benefits Determination, as described in the following sections. The Project is intended to provide a significant public benefit by enhancing the safety of Logan Airport for aircraft and their passengers.

3.6.5.1 Purpose and Effect of the Project

The purpose of the proposed RSA improvements is to increase safety for aircraft and their passengers in emergency situations by enhancing the RSA at the end of Runway 27 consistent with FAA's orders and regulations (see Chapter 1, *Purpose and Need for the Proposed Action*).[24] Logan Airport is a commercial service airport that receives federal funding for airport improvement projects, and is required by the FAA to meet FAA-mandated RSA design criteria.[25] The project will also protect Boston Harbor in the event of an overrun or undershoot event, by preventing aircraft from entering the harbor.

3.6.5.2 Impact on Abutters and the Surrounding Community

There will be no permanent adverse impacts to the surrounding community by the proposed Project, as Logan Airport is an isolated peninsula surrounded by water on three sides. Truck traffic would occur during construction; however, noise and air emissions from these trucks would not affect residents or businesses in adjacent communities, as the distance of greater than 2,800 feet creates a buffer. There will be no permanent change to air quality or noise at the airport because of the proposed safety improvements, nor permanent changes to aircraft operations. No disproportionate adverse impacts are anticipated to EJ populations during construction or implementation. Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*, describes mitigation commitments for any impacts during construction.

3.6.5.3 Enhancement to the Property

The Project includes important safety improvements at the Airport. The existing Runway 27 RSA does not meet current FAA airport design standards for RSAs. The Runway 27 Proposed Project would include construction of an approximately 650-foot-long by 306-foot-wide pile-supported deck with EMAS. The Proposed Project would maintain runway utility and capacity and would provide protection and functionality near equivalent to an RSA that fully meets the design criteria.[26] It would also substantially enhance access by rescue personnel as well as egress by passengers.

3.6.5.4 Benefits to the Public Trust Rights in Tidelands

Considering the Massachusetts Port Authority Enabling Act, preservation of public safety and security at Logan Airport has been legislatively determined to be an appropriate use of the public trust held in the affected tidelands. Other potential public interests in tidelands that might otherwise be affected by the proposed safety project are limited due to existing Airport security restrictions. Under state law, no

24 Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.
25 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.
26 U.S. Department of Transportation, Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston,* Massachusetts, January 30, 2009, p. 6.

public access is allowed within the Logan Airport Security Zone within which the entire proposed Project is located. Limited shellfish harvesting by licensed clammers is allowed within the Security Zone with prior notice from DMF.

Although the proposed RSA improvements would be conducted in Chapter 91 waterways and tidelands, there are no significant impacts to the public's existing interests in these tideland areas. The only interests relevant to the proposed RSA Project Site are shellfishing, living marine resources, and water quality. Shellfishing will continue to be permitted in accordance with the provisions of the Security Zone Statute in those areas that have historically supported that activity. The Project is designed to protect, restore, and enhance living marine resources, as described in Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*. Water quality goals will continue to be attained.

3.6.5.5 Community Activities on the Site

Due to aviation operations and state and federal security restrictions, there are no community activities that take place on the Project Site.

3.6.5.6 Environmental Protection and Preservation

The Project aims to avoid and minimize impacts to wetland resources, as described in Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*. Mitigation measures for impacts to wetlands are proposed. Massport proposes a wetland mitigation goal of 1:1 restoration or replacement of 1,200 square feet of filled wetland area (piles and emergency egress ramps) via construction or restoration of mud flat based on current USACE and MassDEP guidance. The proposed RSA deck will overshadow coastal wetland resources, but they will continue to provide functional value such as habitat, storm damage prevention, protection of land containing shellfish, and protection of fisheries.

3.6.5.7 Public Health and Safety, and the General Welfare

The RSA improvements will address an overriding public interest in aviation safety. Safety enhancements to the RSA reduce the potential for injury to passengers, aircraft crew, and first responders. RSAs reduce the risk of damage to aircraft and injury to persons inside the aircraft should the aircraft overrun, undershoot, or veer off the runway. RSAs also provide additional safety in comparison to existing conditions during less-than-ideal weather conditions, when it is more likely that an aircraft will need additional distance to land.

3.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Although there have been reported spills and releases at Logan Airport, these have been addressed through the Massachusetts Contingency Plan (MCP) (310 CMR 40) process, and no releases have occurred within the vicinity of the Proposed Project Study Area. Tracking of MCP activity is reported annually by Massport and can be found in the Logan Airport *2020/2021 Environmental Data Report* (EDR) (EEA #3247).[27]

27 Massachusetts Port Authority, *2020/2021 Environmental Data Report*, Boston Logan International Airport, EEA #3247, Chapter 8, "Environmental Compliance and Management/ Water Quality," and Appendix J, "Environmental Compliance and Management/Water Quality," November 2022, https://www.massport.com/logan-airport/about-logan/environmental-reports/.

Several state and federal regulatory programs govern the requirements for site remediation, transport of regulated hazardous materials,[28] and potential spills during construction. In the Commonwealth of Massachusetts, the management of hazardous materials and petroleum products when released into the environment is generally governed by the MCP.

3.7.1 Affected Environment

The regulatory status of a disposal site and relevant MCP reporting documentation is publicly available to review via the MassDEP Waste Site and Reportable Release/Spills Lookup website. Based on a search of the USEPA online database, there are no National Priority List (NPL) sites on Logan Airport. MassDEP documented releases have been documented within the greater Logan Airport; however, none of these documented releases are located within 500 feet of the Study Area. As noted in the Secretary's Certificate on the DEIR, original reported Massport site # LOGBM-0147 is not in the Project Study Area and is correctly identified at the Logan Airport airside jet fuel storage facility and its associated underground distribution infrastructure and hydrant fueling system.

3.7.2 Environmental Consequences

The environmental consequences of the Proposed Project on solid and hazardous waste were determined by reviewing the USEPA NPL for sites on Logan Airport and the MassDEP Waste Site and Reportable Releases database as well as review of other materials provided by Massport to determine if there is any potential for discovering solid or hazardous waste during construction. Direct impacts could include the potential for the Proposed Project to result in the accidental discharges of fuel or hydraulic fluid.

3.7.2.1 No Action Alternative

There would be no change to the Runway 27 End that could cause a release of hazardous materials and no solid waste would be generated.

3.7.2.2 Proposed Project

There would be no operational changes to the use of Runway 27 that would result in an impact relative to hazardous materials and solid waste. It is not expected that off-site disposal of dredged or excavated materials is required. Any impacts associated with the management of hazardous materials or solid wastes would be mitigated during construction as further discussed below.

3.7.3 Mitigation Measures

A small quantity of sediment is anticipated to be generated during dredging associated with construction activities. Sediments can often contain naturally occurring metals and therefore sediments will be properly handled and managed during construction. Spill control and containment Best Management Practices (BMPs) would be used during construction to mitigate potential spills or accidental discharges of fuel, hydraulic fluid, and other construction materials.

28 Hazardous material means material, including, but not limited to, any material in whatever form which, because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious, or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment, when improperly stored, treated, transported, disposed of, used, or otherwise managed.

3.8 Historical, Architectural, Archaeological, and Cultural Resources

The identification of historic properties and the potential effects of the Project on these resources is determined through the FAA's and Massport's consultation with the Massachusetts Historical Commission (MHC), the Massachusetts Board of Underwater Archaeological Resources (BUAR), Tribes, and other identified consulting parties. As described in Section 4.10 of the DEIR[29], the Project is compliant with Section 106 of the National Historic Preservation Act (36 CFR 800), M.G.L Chapter 9, Sections 26-27c, as amended by Chapter 254 of the Acts of 1988, (950 CMR 71), and M.G.L. Chapter 6, Sections 179-180 and Chapter 91, Section 63.

3.8.1 Affected Environment

Logan Airport has been inventoried; no individually listed resources or eligible resources have been identified in or near the Study Area or APE. In a letter dated September 21, 2021, BUAR[30] stated that through a preliminary review of files and secondary literature sources, no record of any underwater archaeological resources was found.

3.8.2 Environmental Consequences

As described in DEIR Section 5.7[31], Cultural/Historic Resources, no historic resources were identified in the APE. Therefore, no effects are anticipated under the No Action Alternative and no direct or indirect impacts (physical and non-physical) are anticipated under the Proposed Action.

3.8.3 Mitigation Measures

No temporary, construction period impacts to historic resources would be anticipated. Per the BUAR's instructions, if an archaeological feature is encountered during in-water construction, Massport will follow the protocol in the Policy Guidance for the Discovery of Unanticipated Underwater Archaeological Resources (October 2019).

3.9 Land Use

The FAA requires airport operators to ensure that actions are taken to establish and maintain compatible land uses around an airport to increase safety and minimize the effects of aircraft noise and environmental impacts.

Section 1502.16(c) of the Council on Environmental Quality (CEQ) Regulations requires the discussion of "possible conflicts between the proposed action and the objectives of federal, regional, state, and local…land use plans, policies and controls for the area concerned." Land use consistency with the surrounding environment is regulated by the Airport and Airway Improvement Act of 1982 and the

29 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, Chapter 4, Existing Environment, pages 4-37 to 4-38, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

30 Comment Letter on the ENF received from the Massachusetts Board of Underwater Archaeological Resources, dated September 21, 2021.

31 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, Chapter 5, Impact Assessment, pages 5-36 to 5-37, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Airport Improvement Program (AIP), which are both overseen by the FAA. These regulations establish that airport development occurs on land consistent with airport use and activities with concurrence of public agencies for development. As described in FAA Advisory Circular (AC) 150/5190-4B, *Airport Land Use Compatibility Planning*, Airport sponsors and owners are obligated to pursue all reasonable and appropriate actions to secure and promote compatible land use and development within their local areas.[32]

3.9.1 Affected Environment

The Runway 27 End is located within the City of Boston on filled land adjacent to Boston Harbor. Logan Airport is within the East Boston Neighborhood Zoning District and the Logan International Airport Subdistrict. As described in the Boston Planning & Development Agency Code of Ordinances, "The purpose of this Subdistrict is to accommodate those uses necessary to the operation of an international airport while ensuring that such uses do not impose adverse impacts on traffic and parking in the residential, commercial, and waterfront areas of the East Boston Neighborhood District."[33] Land uses surrounding the Runway 27 End include a mix of residential, commercial, and industrial. The closest residences to the Proposed Project are approximately 2,400 feet to the east across Boston Harbor in the Town of Winthrop. As described in Section 4.5 of the DEIR in Chapter 4, *Existing Environment*,[34] the Study Area is not fully accessible to the public as it is within Logan Airport's 500-foot Security Zone as established by M.G.L. Chapter 90, Section 61.

3.9.2 Environmental Consequences

The existing ISA at the Runway 27 End does not meet current FAA design standards for a full dimension RSA (1,000-foot overrun or 600-foot undershoot protection) for the runway's design aircraft. The No Action Alternative would not enhance the safety of aircraft and passengers during takeoff and landing as directed by FAA.

The proposed Runway 27 End RSA Improvements would be constructed in the City of Boston primarily within the Airport's boundary as shown on **Figure 3-1**. The Project is consistent with existing land use plans and designations in the project vicinity and would not result in changes to existing land uses on- or off-Airport at any point during construction or operation. The Project would be constructed within the Logan Airport Security Zone and would extend beyond the shoreline. The proposed RSA deck would be approximately 175 feet away from the Boston Harbor navigation channel at its nearest point. The proposed RSA deck would not limit vessel navigation outside the deck or between the deck and the navigation channel. Boats operating in the outer 250-foot security zone would need to divert around the footprint of the RSA deck. Boats are not permitted to anchor within the existing Logan Airport 500-foot security zone and the proposed RSA deck would not change the existing restriction on boating activities.

The Project would not permanently change the daily aircraft operations, type of aircraft, or location in which aircraft operate; therefore, no permanent direct impacts to noise sensitive land uses resulting from

32 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5190-4B, *Airport Land Use Compatibility Planning*, September 16, 2022.

33 Boston Planning & Development Agency, Boston Redevelopment Authority, Regulations Applicable in the Logan International Airport Subdistrict, Section 53-38 to 41, Codified through Acts of 2020, Ch. 365, enacted January 14, 2021.

34 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, Runway 27 End Runway Safety Area Improvements Project, Boston Logan International Airport, Chapter 4, Existing Environment, pages 4-24 to 4-27, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

the proposed Runway 27 End RSA would occur. See Section 3.11, Noise and Noise-Compatible Land Use, for additional information. The Project would enhance safety for aircraft and their passengers in emergency situations by improving the RSA at the end of Runway 27. With the proposed EMAS installed, the Project would provide an equivalent level of safety of a full dimension RSA to achieve compliance with FAA RSA design standards.

3.9.3 Mitigation Measures

Although construction noise levels are not anticipated to exceed City of Boston construction noise limit criteria, Massport will consider construction measures, such as noise dampening mats employed during pile-driving activities, to minimize noise impacts where possible. The temporary closure of Runway 9-27 for construction of the Proposed Project during each of the 60-day construction periods in 2025 and 2026 may result in shifts in aircraft noise. As currently occurs depending on wind and weather, during the closure, aircraft operations would shift from Runway 9-27 to Runways 4R-22L, 4L-22R, Runway 33L, and Runway 32, potentially increasing the number of overflights on these runways when Runway 9-27 is unavailable. It is expected that utilization of Runway 15R-33L for late nighttime operations would not be affected by the Project.

An RSA is a required public safety measure associated with an existing runway at Logan Airport and is defined as an "Infrastructure Facility" by 310 CMR 9.02. Pursuant to 310 CMR 9.55, a proposal for an "Infrastructure Facility" shall include "mitigation and/or compensation measures as deemed appropriate by the [MassDEP] to ensure that all feasible measures are taken to avoid or minimize detriments to the water related interests of the public." The proposed RSA would incorporate measures to protect water quality and to avoid and minimize impacts to marine resources (see Section 3.14, Water Resources). Given the nature of the statutory Logan Airport Security Zone, the other water-related interests of the public are not applicable to this location.

In light of the express legislative authorization for Massport to own, operate, and maintain Logan Airport in conformity with public safety standards, the express authorizations of the Enabling Act for Massport to use adjacent submerged lands if necessary for operation of the airport, and the statutory designation of the affected area as the Logan Airport Security Zone pursuant to M.G.L. Chapter 90, Section 61, the Project may be treated as a "Project With Special Legislative Authorization" under 310 CMR 9.31(4).

The proposed RSA deck and emergency egress ramps would be constructed within an area, portions of which were previously altered for an ISA that was authorized by Waterways License (No. 3467) issued to Massport. The RSA deck will be different than previously authorized and Massport will seek an amendment of the existing Chapter 91 License to allow the RSA deck and emergency egress ramps (refer to Section 5.3 of DEIR Chapter 5 for more information).[35]

3.10 Natural Resources and Energy Supply

The FAA requires the consideration of potential impacts associated with a project's consumption of natural resources (e.g., water, aggregate, and wood) and use of energy supplies (e.g., electricity and fuel) that may result from construction, operation, and/or maintenance of a project. Per FAA Order 1053.1,

35 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Chapter 5, Impact Assessment, pages 5-19 to 5-26, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Energy and Water Management Program for FAA Buildings and Facilities,[36] the FAA encourages the development of facilities designed and constructed with sustainability and energy efficiency in mind, states in the *1050.1F Desk Reference* that "All elements of the transportation system should be designed with a view to conservation of energy and other resources, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public."[37]

Sections 1502.16(e) and (f) of the CEQ Regulations require that federal agencies consider energy requirements, natural depletable resource requirements, and the conservation potential of alternatives and mitigation measures in National Environmental Policy Act (NEPA) documents. Applicable statues and executive orders relevant to natural resources and energy supply impacts include the Energy Policy Act of 1992 (42 U.S.C. 15801 et seq.), the Energy Independence and Security Act of 2007 (42 U.S.C. 17001 et seq.), and Executive Order 13834, *Efficient Federal Operations* (83 Federal Register 23771).

3.10.1 Affected Environment

Electricity and gas are provided to Logan Airport via Eversource, the utility remains committed to providing reliable energy service to the Airport.

3.10.2 Environmental Consequences

No improvements to the Runway 27 End RSA would be constructed under the No Action Alternative and no changes to airport operations would occur; therefore, no changes related to energy supply or natural resources would be expected under the No Action Alternative.

The proposed Runway 27 End RSA Improvements Project would not permanently change aircraft operations, type of aircraft, aircraft taxi routes, or the location in which aircraft operate. The demand for fuel, electricity, water, and sewer services would continue to correlate with forecasted operations. The Proposed Project is not expected to change energy requirements at Logan Airport nor require the use of scarce or rare materials for construction. Materials to be used for the construction of the Project would primarily consist of fuel, asphalt (e.g., for the relocation of the perimeter road and emergency egress ramps), concrete (e.g., piles, pile caps, EMAS blocks, beams, girders, transition slab and deck slab), and steel (e.g., sheet pile wall). Adequate supplies are expected to be available within local material sites. The Project would not cause demands exceeding available or future natural resources or energy supplies. Therefore, no significant natural resources and energy supply impacts are anticipated.

3.10.3 Mitigation Measures

The Proposed Project is not anticipated to result in any permanent direct or indirect impacts to natural resources and energy supply, nor significant impacts resulting from construction activities, therefore no mitigation is required. Although no significant construction impacts to natural resources and energy supply are anticipated, Massport would implement the following procedures and best practices where possible to reduce the effects of construction on natural resources and energy supply:

36 U.S. Department of Transportation, Federal Aviation Administration, Order 1053.1C, *Energy and Water Management Program for FAA Buildings and Facilities*, October 26, 2017.
37 U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, *1050.1F Desk Reference*, Version 2, February 2020.

- In accordance with Massport standards, the contractor would create a construction waste management plan containing BMPs to reduce waste generation during construction, including a disposal plan for excess construction materials.
- Construction materials would be recycled in accordance with the asphalt pavement, brick, and concrete policy per the MassDEP.
- Contractors would be required to comply with the sustainability requirements and best practices set forth in Massport's Sustainability and Resiliency Design Standards and Guidelines (SRDSG), which include measures to reduce energy and water consumption during construction, reduce the consumption of virgin material, and reduce fuel use.
- Contractors would be required to limit idling, to use Tier III or Tier IV equipment where feasible, and to implement construction worker vehicle trip management techniques to reduce fuel use during construction.
- Massport intends to pursue the Institute for Sustainable Infrastructure's (ISI) Envision third-party certification for the Proposed Project. Envision is a sustainability rating system designed to help stakeholders build more sustainable, resilient, and equitable civil infrastructure.[38]

3.11 Noise and Noise-Compatible Land Use

For actions that include sources of noise other than aircraft in flight, such as surface transportation improvements or construction, FAA Order 1050.1F states that the noise analysis should be conducted using accepted methodologies from the appropriate modal administration, including the Federal Highway Administration (FHWA) for construction noise. Massport also uses guidelines and regulations established by the City of Boston for evaluating and controlling sound levels associated with construction activities. The Air Pollution Control Commission of the City of Boston, acting under the authority granted in M.G.L. Chapter 40, Section 21, and by the City of Boston Code, Ordinances, Title 7, Section 50, has adopted regulations for the Control of Noise in the City of Boston. Regulation 3: "Restrictions on Noise Emitted from Construction Sites" establishes maximum allowable sound levels based upon the land use impacted by the construction of a Proposed Project. The noise criteria provided in the regulations were used to evaluate whether the Project would generate sound levels that result in adverse impacts.

3.11.1 Affected Environment

The noise environment at Logan Airport is documented and analyzed in the Logan Airport 2018/2019 EDR[39] and most recently in the 2020/2021 EDR.[40] The Day-Night Average Sound Level (DNL) contours were prepared in the EDRs using FAA's Aviation Environmental Design Tool (AEDT) for DNL values of 60, 65, 70, and 75 decibels (dB). The DNL is a measure of the cumulative noise exposure over a 24-hour day and is the FAA-defined metric for evaluating noise and land use compatibility. The residential areas within the 2019 DNL 65 dB contour have previously participated in the Massport Residential Sound

38 Institute for Sustainable Infrastructure, *Envision Sustainable Infrastructure Framework Guidance Manual*, Version 3, 2018, https://sustainableinfrastructure.org/wp-content/uploads/EnvisionV3.9.7.2018.pdf.
39 Massachusetts Port Authority, *2018/2019 Environmental Data Report*, Boston Logan International Airport, EEA #3247, Chapter 6, "Noise Abatement," and Appendix H, "Noise Abatement," December 2020, https://www.massport.com/logan-airport/about-logan/environmental-reports/.
40 Massachusetts Port Authority, *2020/2021 Environmental Data Report*, Boston Logan International Airport, EEA #3247, Chapter 6, "Noise Abatement," and Appendix H, "Noise Abatement," November 2022, https://www.massport.com/logan-airport/about-logan/environmental-reports/.

Insulation Program.[41] The 2019 DNL 65 dB and 70 dB contours extend over Point Shirley in Winthrop primarily due to aircraft arrivals to Runway 27 and departures from Runway 9.

Massport has two noise monitors located in Point Shirley east of Runway 9-27. Noise Monitor 4 is the closest to the runway end and historically reports an aircraft DNL greater than 70 dB. Noise Monitor 5 is located further away and not under the runway extended centerline and historically reports an aircraft DNL less than 65 dB. As summarized in DEIR Section 5.10, existing sound levels reported in **Table 3-7** are based on measured day-night sound levels from noise monitoring stations located in communities surrounding Logan Airport. To compare to the City of Boston's noise criteria, the L_{dn} sound levels were converted into daytime (7 AM to 7 PM) L_{10} sound levels.[42] The daytime sound levels were based on the overall L_{dn} measured value, which includes both aircraft and community noise. The conversion process was based upon the FHWA's Roadway Construction Noise Model and the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment Manual*.[43]

Table 3-7 Sound Levels (dBA) at Massport's Existing Winthrop Noise Monitoring Stations

Noise Monitoring Station	Monitoring Location[1]	L_{dn}	Daytime L_{10} (7 AM to 7 PM)[2]
4	Bay View Avenue and Grand View Avenue – Winthrop	75	80
5	Harborview and Faun Bar – Winthrop	62	67
6	Somerset Avenue near Johnson Avenue – Winthrop	69	74

Source: Logan International Airport 2019 Annual DNL Report. The daytime background sound levels represent both community and aircraft noise sources. Total DNL reported at the monitor was used because it includes both community and aircraft noise sources.
1. See DEIR Figure 5-3, "Massport Noise Monitoring Station Locations."
2. Stations measure L_{dn}. L_{10} was derived from L_{dn}.

3.11.2 Environmental Consequences

Construction period noise impacts would be related to deployment of equipment, and transportation of construction workers and materials rather than changes in aircraft operation (as described below). No changes to the noise environment would occur under the No Action Alternative.

Construction Period Aircraft Operations

Construction associated with the RSA safety improvements would result in the temporary closure of Runway 9-27 during each of the two planned 60-day construction periods. Short term changes in air traffic procedures (not to exceed six months to accommodate airport construction such as during the proposed Runway 9-27 closures) are categorically excluded from environmental analysis because the FAA has determined that this type of action does not have a significant effect on the human environment (Section 5-6 of FAA Order 1050.1F). Since no new flight paths will be in use during construction, there would be no additional impact to neighboring communities, including EJ communities. The proposed

41 Because of the COVID-19 pandemic, Logan Airport operations for the 2020 and 2021 calendar years were fewer than experienced in 2019; therefore, 2019 is used for reference in context of the affected environment for noise. The Project is a safety enhancement and would not extend runway length or effect normal runway operations, runway capacity, runway use, or the types of aircraft using the runway.

42 L_{10} is the A-weighted sound level which is exceeded 10 percent of the time during a specified period. During a 10- minute period, the L_{10} would be the sound level which was exceeded by other sound levels for one minute.

43 U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, prepared by John A. Volpe National Transportation Systems Center, September 2018.

RSA improvements will not change how Logan Airport operates and therefore, no changes to the Airport noise profile would occur with this safety project.

As described in the Air Quality section above, no new flight paths will be created during the construction period, rather flights would be reallocated to existing runways and flight paths in the short-term. Construction associated with the Proposed Project would result in the temporary closure of Runway 9-27 during each of the planned 60-day construction periods in 2025 and 2026. During the closures, aircraft operations are anticipated to temporarily shift from Runway 9-27 to other runways already in use, temporarily increasing the number of operations along the flight paths of the other runways. Overall operations would remain the same with the equivalent decrease in Runway 9-27 operations. The short-term shift in aircraft runway use will depend on wind and weather and FAA air traffic control safety determinations. There is expected to be minimal impact from the Project on the continued preferential use of Runway 15R for late-night departures and Runway 33L for late-night arrivals. Any shifting of flights to other runways would be utilizing existing flight paths. There may be some temporary changes in aircraft noise due to the closure of Runway 9-27 during each of the 60-day construction periods in 2025 and 2026. During the closure, aircraft operations would shift from Runway 9-27 to other runways, temporarily increasing the number of overflights related to the other runways.

Information regarding operations during the summer of 2021 is provided in Appendix E.1, *Air Quality and Noise Supporting Documentation.* Since there no new flight paths will be in use during construction there would be no additional impact to neighboring communities, including EJ communities. The proposed RSA improvements will not change how Logan Airport operates and therefore, no changes to the Airport noise profile would occur with this project.

Construction Period Noise

Construction period noise is anticipated for 120 days total during two separate 60-day periods, one in 2025 and one in 2026. As described in the DEIR, noise levels are not anticipated to exceed the City of Boston's construction noise limit criteria. Massport will minimize noise from surface traffic during construction by having much of the construction materials and workers access the Project Site by water on barges and boats. Trucks used to transport concrete and the EMAS materials would access the site by Route lA, Interstate 90, and the main Airport roadways only. Trucks would be prohibited from using local streets unless they are seeking construction-related access to or from local businesses.

As described in the DEIR, project construction is expected to generate typical sound levels associated with construction activities, including use of heavy equipment for excavation, material transport, pile driving, and installation of the concrete deck and EMAS. The noise analysis was conducted for noise propagation over a hard surface, such as water, and provides noise levels for each of the two 60-day construction periods, one each in 2025 and 2026, based on the equipment anticipated to be used during each period. The results of the noise modeling are shown in **Table 3-8** which shows the construction sound levels anticipated from the Proposed Project in each construction period.

As shown in **Table 3-8**, L_{10} sound levels from construction would range from a low of 60 dBA in 2026 at Fort Independence Park in South Boston, the receptor that is located farthest from the Project Site, to a high of 73 dBA in 2025 at the closest locations to the Project Site at Frances Street and Pico Avenue and Woodside Park, Baker Road, and Bartlett Parkway in Winthrop. These sound levels are below the City of Boston's criteria on noise emitted from construction sites, which is $L_{10} = 75$ dBA for residential land uses and $L_{10} = 80$ dBA for recreational land uses.

Table 3-8 Predicted Construction Sound Levels (L_{10}, dBA)[1,2]

Receptor	Location[3]	2025[4]	2026[4]
1	Grand View Avenue between Undine Avenue and Foam Street	72	70
2	Grand View Avenue between Shirley Street and Billows Street	71	69
3	Townsend Street and Maryland Avenue	70	68
4	Frances Street and Pico Avenue	73	71
5	Woodside Park, Baker Road, and Bartlett Parkway	73	71
6	Johnson Avenue between Bellevue Avenue/Sargent Street	70	68
7	Court Road between Sargent Street/Albert Avenue	69	67
8	Fort Independence Park	63	60
9	Washington Avenue between Bates Avenue and Lewis Avenue	69	66
10	Shirley Street between Crystal Cove Avenue and Park Avenue	68	66

1 L_{10} represents total sound level of all equipment.
2 City of Boston noise criteria from construction sites is limited to L_{10} = 75 dBA at a residential or institutional land use and L_{10} = 80 dBA at recreational land use.
3 See DEIR Figure 5-2.
4 Construction is anticipated to occur for a 60-day period between July and October of each year.

As discussed in Section 3.4.4.1, construction equipment (barges, cranes, pile driving, etc.) would result in activity and noise in the vicinity of Runway 27. Construction, particularly pile driving, can generate high noise levels underwater that could potentially harm fish species in proximity. The sounds from pile driving result from the impact of the solid surface of the hammer with that of the pile. They are repeated, usually at intervals greater than one second, for some minutes and/or hours. Construction activity and noise would likely cause fish and other marine species to move away from the construction zone.

Construction could result in temporary impacts to protected species habitat because of several activities. Construction equipment (barges, cranes, increased boat traffic, pile-driving, etc.) would result in activity and noise in the vicinity of the Runway 27 End. Activity and noise could cause protected species to avoid the work area and therefore avoid potential adverse impacts of sedimentation and noise. Construction, particularly pile-driving, can generate high noise levels underwater that could potentially harm protected species. Because of the activity and noise of construction, protected species (if present in Boston Harbor) would be expected to avoid the area during active in-water construction, which is anticipated to occur for two 60-day periods between July and October in 2025 and 2026 (for a total of 120 days).

Indirect Impacts

No indirect impacts to noise sensitive land use are anticipated because the proposed Runway 27 End RSA Improvements Project would not change the daily aircraft operations, type of aircraft, or location in which aircraft operate.

3.11.3 Mitigation Measures

While noise levels are not anticipated to exceed the City of Boston's construction noise limit criteria, Massport will employ noise-dampening measures during pile driving to minimize noise impacts, where possible. Massport hosts a noise complaint portal that is accessed via Massport's website.

3.12 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

The proposed RSA Improvements Project would not affect the socioeconomic characteristics of the area because the Project is limited to improving safety and does not include changes in employment or economics. The Project would not cause housing relocation, relocation of community businesses, disruption of local traffic patterns, or a substantial loss in community tax base. Project construction would have a positive economic and jobs impact.

This section considers the potential of the Project to cause disproportionate adverse effects to EJ populations which include minority, low-income, and/or linguistically isolated populations. EJ was evaluated in Chapter 6 of the DEIR and this section expands on findings in response to the Secretary's Certificate. Health and safety risks that pertain to children are also included and analyzed.

Following an assessment of existing unfair or inequitable environmental and health burdens and an analysis of Project impacts on EJ populations, this safety project is not anticipated to exacerbate existing environmental and health burdens of the surrounding EJ communities. No disproportionate adverse impacts to EJ populations are anticipated. The Project would not permanently change runway operations, capacity, runway use, or types of aircraft using the runway. Project construction would be temporary and would not exceed applicable significant impact thresholds for noise, air quality, or water quality. The potential shifting of flights during construction is not anticipated to result in disproportionate adverse impacts to EJ populations. As with current operations, any shifting of flights would be utilizing existing flight paths and is subject to wind, weather, and FAA safety requirements.

3.12.1 Regulatory Setting

3.12.1.1 Children's Health and Environmental Safety Risks

Children's environmental health refers to the effect of environmental exposure during early life, from conception until 21 years of age, since children may be at a greater risk to environmental contaminants than adults due to differences in activity patterns, behavior, and biology.[44] Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed to identify and assess environmental health risks and safety risks that may disproportionately affect children.[45] These may include risks that are attributable to products or substances that a child is likely to contact or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to. In particular, the Task Force on Environmental Health Risks and Safety Risks to Children, which was created by Executive Order 13045, identified four priority concerns: 1) asthma,

44 U.S. Environmental Protection Agency, "2021 Policy on Children's Health," October 5, 2021, https://www.epa.gov/children/epas-policy-childrens-health.
45 The White House, Executive Office of the President, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, 62 Federal Register 19885, April 21, 1997.

2) unintentional injuries, 3) developmental disorders (including lead poisoning), and 4) cancer. In consideration of potential impacts to children's health and safety, resource areas such as air quality, water quality, and noise were considered in alignment with Executive Order 13045.

3.12.1.2 Environmental Justice

Effective June 24, 2021, the *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs* (2021 EJ Policy) incorporates definitions for EJ principles and populations, as well as environmental benefits and burdens, included in Chapter 8 of the Commonwealth of Massachusetts Acts of 2021, *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*. The 2021 EJ Policy builds upon Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which "directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law."

In accordance with the EJ Policy and Executive Order 12898, this Draft EA/Final EIR identifies whether any EJ populations located within one mile of the Project Site would be negatively affected by the Project (refer to Appendix E.4, *EJ Supporting Documentation*, and Appendix E.5, *Updated Environmental Justice Outreach Plan*, for more information).

3.12.2 Affected Environment

3.12.2.1 Children's Environmental Health and Safety Risks

Land uses and geographic information system (GIS) mapping data were reviewed to determine the presence of schools, daycare facilities, parks, and/or children's health clinics in the vicinity of the Project. To identify how many children live in the neighborhoods closest to the Runway 27 End and their ages, U.S. Census Bureau data on children was collected using EJScreen, the USEPA's EJ screening and mapping tool.

No schools, daycare centers, children's health clinics, or any other concentrated populations of children are known to exist in the Project Area. The closest facilities of this type are the Children's Corner Preschool and Winthrop Country Day Learning (preschool), both located approximately 5,000 feet north of the Runway 27 End across Boston Harbor. The closest residences to the Runway 27 End are in the Town of Winthrop and include the neighborhoods of Cottage Park, Cottage Hill, and the Point Shirley, which are located across Boston Harbor. The closest residences in Cottage Park are approximately 3,000 feet north of the Runway 27 End threshold, the closest residences in Cottage Hill are approximately 5,000 feet northeast of the Runway 27 End, and the closest residences in Point Shirley are approximately 3,400 feet east of the Runway 27 End.

According to U.S. Census Bureau data published in EJScreen, the percent of the population under age 5 makes up 4 percent of the population in the nearest census block group in Cottage Park (13th percentile in the Commonwealth of Massachusetts), 6 percent of the population in the nearest census block group in

Cottage Hill (60th percentile), and 1 percent of the population in the nearest census block group in Point Shirley (10th percentile).[46]

3.12.2.2 Environmental Justice

This section provides an updated assessment of existing unfair or inequitable environmental burden on identified EJ populations within 1 mile of the Project, characterized as the Project's Designated Geographic Area (DGA), through analysis of the Massachusetts Department of Public Health EJ Tool (DPH EJ Tool), USEPA's EJScreen, and RMAT (see Appendix E.3, *RMAT Output Report*, and Appendix E.4, *EJ Supporting Documentation*).

Table 3-9 summarizes EJ block groups within one mile of the Project Site. As requested by the Secretary's Certificate, this table includes updates to census tract identification within one mile of the Project Site.

Table 3-9 Environmental Justice Block Groups Within the Designated Geographic Area

Block Group	Census Tract	Location	Median Household Income	Total Minority Population	Percent (%) of Households with English Isolation	Languages (at census tract level) [1]
0 [2]	9901.01	Boston	N/A	N/A	N/A	N/A
1	9801.01	Boston	Not available	62%	0%	Spanish or Spanish Creole (6.4%)
2	1804.00	Winthrop	$113,906 (133% of state median)	26%	2%	N/A
2	9813.00	Boston	$128,000 (149% of state median)	41%	4%	Spanish or Spanish Creole (20.2%)

Source: EJ Maps Viewer, 2022.
Notes: The data presented is directly from the classifications in the EJ Maps Viewer, which differs from MEPA's definition of EJ populations under the Climate Roadmap Act. Refer to DEIR Figure 6-1, which explains the discrepancy.
1 Data is from "Languages Spoken in Massachusetts" tab of the EJ Maps Viewer to determine languages spoken by at least 5 percent of population in the census tract who do not speak English very well. These data inform outreach and translation services.
2 No relevant EJ data likely due to location in Boston Harbor.

Assessment of Existing Unfair or Inequitable Environmental Burden

Under Section 58 of Chapter 8 of the Acts of 2021: *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy*, and consistent with 301 CMR 11.06(7)(b) and 11.07(6)(n), each project to which the new EIR requirement applies under Part I must submit an EIR that contains "statements about the results of an assessment of any existing unfair or inequitable environmental burden and related public health consequences impacting the EJ population from any prior or current private, industrial, commercial, state, or municipal operation or project that has damaged the environment."

This section addresses Vulnerable Health Criteria, Potential Sources of Pollution, and Climate Change Vulnerability to help assess whether an existing unfair or inequitable environmental burden related to public health consequences has been placed upon the EJ communities, as compared to the general

46 U.S. Environmental Protection Agency, EJScreen Environmental Justice Screening and Mapping Tool, Version 2.0, based on the U.S. Census Bureau American Community Survey Five-Year Estimates (2015-2019), https://ejscreen.epa.gov/mapper/.

population, within one mile of the Project Site. As demonstrated below, one EJ block group within the DGA exhibits vulnerable health criteria for elevated blood lead. The City of Boston is assessed as meeting higher levels of low birth weight and childhood asthma as compared to the statewide average. The Town of Winthrop is assessed as meeting higher levels of elevated blood lead as compared to the statewide average. Other Vulnerable Health Criteria are currently identified as below the statewide median levels.

Department of Public Health Vulnerable Health Criteria

To understand potential health vulnerabilities faced by EJ populations within the Study Area, Vulnerable Health EJ Criteria, as defined by the DPH EJ Tool, were identified within the DGA. Health vulnerabilities of EJ populations provide a basis for identifying and assessing reasonably foreseeable public health consequences that may result from environmental impacts of the Project. The DPH EJ Tool provides information at the community level (defined as municipalities) and at the census tract level. These criteria include four environmentally related health indicators to determine populations that may have higher than average rates of environmentally related health outcomes; these are heart attack, elevated blood lead, low birth weight, and childhood asthma. The analysis was updated since the DEIR with the latest DPH EJ Tool data.

Tables E.4-1 and **E.4-2** in Appendix E.4, *EJ Supporting Documentation,* provide a summary of the census tracts within the DGA that have Elevated Blood Lead Prevalence and Low Birth Weight Rate per 1,000, respectively. Census tracts that include EJ block groups are noted within these tables. Use of the latest DPH EJ Tool data, resulted in a change in census tracts greater than the 110 percent of the statewide rate. Census tract 1804, which contains an EJ block group within the DGA, and census tract 1805, which does not contain an EJ block group, are greater than 110 percent of the statewide rate for elevated blood lead. Census tract 1805 is also greater than 110 percent of the statewide rate for low birth weight. The EJ census tract 1804 therefore has an existing inequitable environmental and health burden for elevated blood lead levels. Project impacts are evaluated in this Chapter with this burden in mind.

As noted earlier in this section, the Heart Attack and Childhood Asthma criteria are only shown at the community level. **Table E.4-3** and **E.4-4** in Appendix E.4, *EJ Supporting Documentation*, presents these vulnerabilities, as well as elevated blood lead prevalence and low birth weight rate per 1,000 at the community level, for Boston and Winthrop as both communities contain at least one EJ block group that falls within the DGA. Low birth weight, and childhood asthma were identified as greater than 110 percent of the statewide rate at the community level in Boston and elevated blood lead was identified as greater than 110 percent of the statewide rate at the community level in Winthrop; however, these findings do not directly correlate to the census tracts that include EJ census blocks because these data are presented at the community level.

Other Potential Sources of Pollution

The DPH EJ Tool was also consulted to identify other sources of pollution that might currently pose a risk to public health within the DGA. Relevant sources of pollution that were evaluated include major air and waste facilities and hazardous material sources. **Table E.4-5** in Appendix E.4, *EJ Supporting Documentation* summarizes these findings and provides an update since the filing of the DEIR. There is one underground storage tank that was identified but is not within an EJ census block. The facility labeled "LOGBM-0147" in the DEIR as a major air and waste facility has been removed in the Draft EA/Final EIR. The facility is Logan Airport's airside fueling station with an underground storage tank. The location of

this facility has been updated by DPH in recent EJ Tool data since the filing of the DEIR and is no longer in the project DGA. Therefore, there are no major air and waste facilities within the project DGA.

U.S. EPA EJScreen

The USEPA's EJScreen tool provides a percentile ranking by census block group, compared against statewide and national averages, for 12 environmental indicators. The USEPA EJScreen Report included in **Appendix E.4**, *EJ Supporting Documentation*, indicates the rankings of each census block group within one mile of the approximate center of the Project Site.

The City of Boston and Town of Winthrop, where the EJ block groups are located, are at or above the 80th percentile for 3 out of the 12 environmental indicators. The USEPA EJScreen Report (see Appendix E.4, *EJ Supporting Documentation*) indicates that the following were shown to be at or above the 80th percentile of the statewide average for EJ populations within one mile of the Project Site (the "Project Buffer Area"):

- **NATA[47] Diesel PM** – The diesel particulate matter (PM) indicator in EJScreen measures concentrations rather than cancer risk, although the USEPA's Health Assessment Document for Diesel Engine Exhaust (Final 2002) concludes that "long-term (i.e., chronic) inhalation exposure is likely to pose a lung cancer hazard to humans, as well as damage the lung in other ways depending on exposure. Short-term (i.e., acute) exposures can cause irritation and inflammatory symptoms of a transient nature, these being highly variable across the population…. [E]vidence for exacerbation of existing allergies and asthma symptoms is emerging."[48] It is important to remember that the air toxics data presented in the EJScreen report provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations.

  The diesel PM concentration in the Project Buffer Area (0.463 μg/m^3) is higher than both the average concentrations in the state and in the U.S.

- **NATA Cancer Risk** – This indicator represents the probability of contracting cancer over the course of a lifetime (70 years), assuming continuous exposure to point, nonpoint and mobile sources, biogenics, and fires. This indicator characterizes cancer risk based on estimates of inhalation exposure concentrations determined at the census tract level. This approach is used only to determine geographic patterns of risks within counties, and not to pinpoint specific risk values for each census tract. While the USEPA is reasonably confident that the patterns (i.e., relatively higher levels of risk within a county) represent actual differences in overall average population risks within the county, they are less confident that the assessment pinpoints the exact locations where higher risks exist, or that the assessment captures the highest risks in a county.

  The value for this indicator in the Project Buffer Area is 34, while the average in the U.S. is 28.

- **NATA Respiratory HI** – This indicator is an estimate of chronic noncancer hazards for multiple air toxics. An HI value less than or equal to 1 indicates that the exposure is not likely to result in adverse non-cancer effects. An HI value greater than 1, however, does not necessarily suggest a

47 The National Air Toxics Assessment (NATA) has been replaced with AirToxScreen. AirToxScreen calculates concentration and risk estimates from a single year's emissions data using meteorological data for that same year. The risk estimates assume a person breathes these emissions each year over a lifetime (or approximately 70 years). The USEPA cautions that AirToxScreen results are best applied to larger areas – counties, states and the nation. Results for smaller areas, such as a census tract, are best used to guide follow-up local studies. AirToxScreen assessments should not be used: to pinpoint specific risk values in small areas such a census tract; to characterize or compare risks at local levels (such as between neighborhoods); to characterize or compare risks between states; to examine trends from one assessment year to another; as the sole basis for risk reduction plans or regulations; to control specific sources or pollutants; or to quantify benefits of reduced air toxics emissions, https://www.epa.gov/AirToxScreen/airtoxscreen-overview.

48 Health Assessment Document for Diesel Engine Exhaust (Final 2002), https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=29060.

likelihood of adverse health effects and cannot be interpreted as a statistical probability of adverse effects occurring.[49]

The HI value for the Project Buffer Area is 0.55, therefore adverse noncancer effects are not likely.

- **Lead Paint** – This indicator quantifies the percent of pre-1960 housing due to increased probability of potential lead paint exposure. The calculation is based on the American Community Service (ACS) housing data.

  The Lead Paint value for the Project Buffer Area is 0.84, therefore providing a higher likelihood of lead exposure from housing.

The EJScreen tool also provides a socioeconomic breakdown of the Project Buffer Area, also known as the DGA in this document. **Table 3-10** provides the percent of populations by demographic that are identified as disadvantaged or at a greater risk of disproportionate impacts. These socioeconomic indicators align and expand upon Massachusetts definition of an EJ population (i.e., minority, low income, and English isolation). It is important to note that the percent of children under the age of 5, 4 percent, is less than the state and national averages.

Table 3-10 Socioeconomic Indicators

Socioeconomic Indicator	Percentage of Population within Project Buffer Area
People of Color	16%
Low Income	10%
Unemployment Rate	5%
Limited English Speaking	2%
Less than High School Education	3%
Under Age 5	4%
Over Age 64	21%

Source: EJScreen, 2022.

Climate Change Vulnerability

Massport updated the RMAT Tool Output Report (Appendix E.3) following the report produced for the DEIR to determine potential climate risks to the surrounding communities. The RMAT Tool identified the Project Site as having a high exposure to sea level rise/storm surge, high exposure to extreme precipitation-urban flooding, and high exposure to extreme heat. As noted in *the MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations*, a high-risk rating for sea level rise/storm surge or extreme precipitation could indicate elevated climate risks for EJ populations that immediately surround the Project Site (i.e., within the Project boundaries). The Project Site boundaries are restricted to the Logan Airport campus, which, while within an EJ block group, does not contain any residential areas. Therefore, although the Project Site is susceptible to future climate conditions, elevated climate risks to EJ populations, which would create an existing unfair or inequitable environmental burden, are not anticipated. While Runway 27 would be susceptible to flooding from sea level rise, the safety improvement is necessary and has been designed to account for resiliency to the extents feasible.

49 Technical Support Document USEPA's Air Toxics Screening Assessment, 2017 AirToxScreen TSD, March 2022. https://www.epa.gov/system/files/documents/2022-03/airtoxscreen_2017tsd.pdf.

Additionally, the *MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations* notes that the risk rating for extreme heat should not be used as a definitive indicator of elevated climate risks. Refer to Appendix E.3, *RMAT Output Report*, for a copy of the RMAT Tool Output Report.

3.12.3 Environmental Consequences

This section examines the anticipated project impacts on air quality, noise, water quality, hazardous materials, and site access and transportation potentially experienced by nearby EJ communities.

The assessment found that no disproportionate adverse impacts to EJ populations are anticipated. The Project would not permanently change runway operations, capacity, runway use, or types of aircraft using the runway. Project construction would be temporary and would not exceed applicable significant impact thresholds for noise, air quality, or water quality. The potential shifting of flights during construction is not anticipated to result in disproportionate adverse impacts to EJ populations as some shifting of flights would occur with or without the Project. As with current operations, any shifting of flights would be utilizing existing flight paths and is subject to wind, weather, and FAA safety requirements.

Environmental Justice

This section examines both the anticipated impacts of climate change on the Project, and the Project's potential impacts on air quality, noise, water quality, hazardous materials, and site access and transportation experienced by the surrounding neighborhood. An evaluation to identify if there would be disproportionate impacts on EJ populations was conducted for every impact category and is summarized below in **Table 3-11**.

Construction associated with the Proposed Project would be temporary and would not exceed applicable significant impact thresholds for noise, air quality, or water quality. Therefore, no significant impacts to EJ communities are anticipated to occur during construction as described below.

Table 3-11 Assessment of Potential Impacts to Environmental Justice Communities

Environmental Category	Potential Impact	Disproportionate Impact
Air Quality and Greenhouse Gas (GHG) Emissions	During construction, any shift of flights would be utilizing existing flight paths and use of those approach and departure routes is subject to wind, weather, and Federal Aviation Administration (FAA) safety requirements. Construction will result in short-term construction-related air and GHG emissions, however, estimated emissions from construction in each year that construction would be below applicable General Conformity *de minimis* thresholds for those pollutants for which the area is designated nonattainment or maintenance.	No See Section 3.3 and 3.5
Noise [1]	There would be no permanent direct or indirect impacts to noise-sensitive land uses resulting from the Project because it would not change daily aircraft operations, type of aircraft, or location in which aircraft operate.	No See Section 3.11

Environmental Category	Potential Impact	Disproportionate Impact
Water Quality and Storm Water	Stormwater management for the proposed Runway Safety Area (RSA) deck and the impervious surfaces will be collected, treated, and discharged in compliance with the Massachusetts Stormwater Management Standards. Runoff from the project area will be sent directly to Boston Harbor, which is a water body subject to tidal flowage. The Project is not anticipated to adversely affect flooding in the surrounding areas. The Project would increase the amount of impervious area by approximately 178,671 square feet compared to existing conditions; however, the receiving body of water is tidal and therefore the Project will not impact floodplain levels.	No See Section 3.14
Hazardous Materials	There would be no changes that would result in an impact relative to hazardous materials and solid waste. Any impacts associated with the management of hazardous materials or solid wastes would be mitigated during construction.	No See Section 3.7
Site Access/ Transportation	The construction area would primarily be accessed from the waterside using marine vessels for movement of construction workers and delivery of construction materials. Per Massport's construction management specifications, heavy duty construction vehicles would be prohibited from using local streets unless they are seeking construction-related access to or from local businesses.	No See Section 3.3

1 The maximum sound levels at all receptors would be below the City of Boston's residential criterion of 86 dBA for all construction phases. maximum construction sound levels. The predicted Lmax during construction is anticipated to be 69 dBA at Frances Street and Pico Avenue (Receptor 4) and Woodside Park, Baker Road, and Bartlett Parkway (Receptor 5) in both 2025 and 2026 (refer to DEIR Chapter 5, Figure 5-10). There is expected to be minimal impact from the Project on the continued preferential use of Runway 15R for late-night departures and Runway 33L for late-night arrivals (a noise abatement procedure to route late-night operations over water rather than over noise-sensitive land uses). The predicted maximum construction sound levels would be experienced at locations that are not within an EJ block group.

Children's Environmental Health and Safety

Impacts to children's environmental health and safety are considered in the context of other resource categories with potential impacts since a significance threshold is not established in FAA Order 1050.1F. When evaluating the context and intensity of potential environmental impacts for children's environmental health and safety, the FAA must consider whether the proposed action or its alternatives would have the potential to lead to a disproportionate health or safety risk to children.

No impacts or risks to children's environmental health or safety are anticipated under the Proposed Action. The Project would not result in significant impacts to air quality or water quality, change the Airport's existing or future noise levels, increase capacity, require the relocation of residences, nor change surface traffic. It would not create or make more readily available products or substances that could potentially harm children via contact or ingestion through air, food, drinking water, recreational waters, or soil. Therefore, no disproportionate impacts to health and/or safety risks to children are anticipated.

Continuing Environmental Justice Outreach

In accordance with the *Interim Protocol for Environmental Justice Outreach* and *Draft MEPA Public Involvement Protocol for Environmental Justice Populations* issued by the MEPA office in 2021, the Project has conducted EJ outreach beginning prior to the filing of the ENF. Massport will continue to conduct EJ outreach in accordance with these policies and as directed by the Secretary's Certificate. Appendix E.5, *Updated EJ Outreach Plan*, includes a summary of EJ outreach to date as well as Massport's commitments to continuing outreach.

3.12.4 Project Benefits

The Project would enhance safety for aircraft and their passengers in emergency situations by constructing improvements to the RSA at the end of Runway 27 consistent with FAA requirements. This Project is a required FAA safety project that would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway. The Project would serve both EJ and non-EJ populations that rely on Logan Airport for travel.

3.12.5 Mitigation Measures

There would be no disproportionate adverse effects or increased climate change risks to EJ populations. Therefore, no mitigation to EJ populations is required. Other than temporary construction impacts, no adverse impacts are anticipated to the surrounding community as there will be no changes to airport operations due to the safety improvements at the end of Runway 27.

3.13 Visual Effects (including Light Emissions)

Visual effects consider the extent to which a proposed action or its alternatives would either: 1) produce light emissions that create annoyance or interference with activities; or 2) contrast with, or detract from, the visual resources and/or visual character of the existing environment. Visual effects, as defined below per the FAA's *1050.1F Desk Reference*,[50] are separated into: 1) Light Emissions; and 2) Visual Resources and Visual Character.

Light Emissions

Light emissions include any light that emanates from a light source into the surrounding environment, such as airfield and apron lighting, navigational aids, terminal lighting, and roadway lighting, as well as glare (light reflected off a surface).

Visual Resources and Visual Character

Visual resources include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics.

Visual character refers to the overall visual makeup of an existing environment. For instance, areas near densely populated areas generally have an urban visual character while less developed areas may have a visual character defined by the surrounding landscape features.

3.13.1 Visual Effects Regulatory Setting

Although no federal regulations govern light emissions, visual resources, or visual character, some visual resources are protected under federal, state, or local regulations. For example, these may include parks, recreation areas, and wildlife/waterfowl refuges; historic properties; scenic roadways; and other resources. Laws protecting resources that may be affected by visual effects include Section 106 of the National Historic Preservation Act (NHPA), Section 4(f) of the Department of Transportation (DOT) Act,

50 U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, *1050.1F Desk Reference*, Version 2, February 2020.

the Wild and Scenic Rivers Act, the Coastal Zone Management Act, and state and regional coastal protection acts.

3.13.1.1 Light Emissions

New light sources associated with the Project were identified and described, and areas potentially sensitive to light emissions from those sources were identified. The potential effects of the light emissions associated with the Project were reviewed and evaluated in comparison with the No Action Alternative to determine whether the light emissions would have the potential to result in adverse effects. Per FAA Order 1050.1F,[51] a significant adverse effect would occur if the Proposed Project would:

- Create annoyance or interference with normal activities from light emissions; and
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.

3.13.1.2 Visual Resources and Visual Character

The potential impact of the Project on area viewsheds was reviewed to determine if its effects would be objectionable when contrasted with the existing environment. Consistent with FAA Order 1050.1F, the Proposed Project was evaluated to determine whether it would:

- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and/or visual character in the study area; and
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

3.13.2 Affected Environment

The Proposed Project would take place at the eastern end of Runway 9-27, extending eastward into and over Boston Harbor. Areas in the vicinity of the Runway 27 End that may be sensitive to visual effects include (estimated distance measured from the Runway 27 End threshold):

- Cottage Park neighborhood (approximately 3,000 feet north)
- Point Shirley neighborhood (approximately 3,400 feet east)
- Cottage Hill neighborhood (approximately 5,000 feet northeast)
- Snake Island (located more than 2,300 feet northeast in Point Shirley)
- Cottage Park Yacht Club (more than 2,800 feet north in Cottage Park)
- Pico Beach (more than 3,300 feet north in Cottage Park)
- Coughlin Park (more than 3,500 feet east in Point Shirley)
- Fisherman Bend Park (more than 3,700 feet north in Cottage Park)
- Cash Murray Memorial (more than 4,400 feet east in Point Shirley)

51 U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Exhibit 4-1, "Significance Determination for FAA Actions," July 16, 2015.

- Holy Rosary Catholic Church and Church@The Well (both more than 4,200 feet east in Point Shirley)
- Yirrell Beach and Point Shirley Beach (more than 4,700 feet east in Point Shirley)
- Winthrop Yacht Club (more than 5,000 feet northeast in Cottage Hill)
- Deer Island (more than 5,500 feet southeast in Fort Dawes)

3.13.2.1 Light Emissions

The Airport is located within an urban environment with high ambient light emissions. Lighting is used at the Airport to support nighttime operations and during periods of low visibility. Runway 9-27 is equipped with light-emitting diode (LED) centerline lights and High Intensity Runway Edge Lights (HIRLs). Runway 9-27 also features takeoff hold lights on either end of the runway. The Runway 27 End includes existing Runway End Identifier Lights and a Precision Approach Path Indicator system. Runway 27 is not equipped with a runway approach lighting system (a configuration of lights extending out from the runway threshold that provide approach guidance to landing aircraft).

The residential neighborhoods and areas located in the vicinity of the Runway 27 End that may be sensitive to light emissions (as noted above) are situated in an existing urban environment that generally experiences high ambient light emissions. Existing views from these facilities towards the Airport across Boston Harbor include light emissions from the Airport's runways, taxiways, and associated airfield lighting systems, terminals, the airport traffic control tower, and other support buildings, as well as existing Boston Harbor-related lighting, and urban lighting in the broader Boston area.

3.13.2.2 Visual Resources and Visual Character

The visual character in the vicinity of the Airport is urbanized and generally characterized by residential development to the north and east across Boston Harbor, and Airport-related development to the west, beyond which is primarily mixed commercial and residential development and the Boston city center. The existing Runway 27 End is slightly elevated above sea level (approximately 15 feet above mean sea level at the threshold) on previously filled tidelands. The shoreline at this runway end is configured as an ISA and is protected with crushed stone and a stone-filled geogrid mattress. The slope of on portions of the shoreline is as steep as 5:1 but generally has a gentler slope. Aircraft navigational aids, including lights, signage, and other equipment, are present within the maintained grass areas along the runway and adjacent taxiways.

In fair weather conditions, it is possible to see the Runway 27 End from the Cottage Park, Cottage Hill, and Point Shirley residential neighborhoods across Boston Harbor. The view towards the Runway 27 End from these neighborhoods is primarily of the open water and the distant end of the ISA shoreline.

3.13.3 Environmental Consequences

The Project would extend the length of the existing RSA from 150 feet up to a maximum of 650 feet on a 306-foot-wide deck. The RSA deck would be supported by pilings and/or caissons starting on land for approximately 150 feet, then extending 450 to 500 feet into Boston Harbor.

3.13.3.1 Light Emissions

Under the No Action Alternative, the safety improvements proposed at the Runway 27 End would not occur and there would be no changes to the existing lighting at the Runway 27 End.

The Project consists of safety enhancements and would not extend the length of Runway 9-27 or effect normal runway operations, runway capacity, runway use, or the types of aircraft using the runway. No new airfield or runway-related navigational light sources are proposed as part of the Project. The Proposed Project would not require the addition or relocation of existing runway or taxiway lighting, signage, or approach lighting (Runway 9-27 is not equipped with a runway approach lighting system).

The Project would include new lighting installed on the proposed RSA deck to designate the structure for boaters in Boston Harbor. Coordination with the U.S. Coast Guard (USCG) was conducted to identify the USCG's preferred lighting (see Appendix C, *Agency Correspondence*). The USCG also recommended relocating the existing buoy at the Logan Airport 250-foot security zone, which features a white flashing light, to accommodate the Project. Massport will work with the FAA in conjunction with the USCG to ensure appropriate navigational lighting is installed in alignment with best practices for safety, and that appropriate notice to mariners is provided.

The residential neighborhoods in Winthrop located north, northeast, and east of the Runway 27 End would not be expected to be able to distinguish the additional lighting in the context of existing lighting near the Runway 27 End, other airfield and airport lighting, Boston Harbor-related lighting, and the surrounding urban environment. The easternmost light on the proposed RSA deck would be no more than 650 feet closer to the neighborhood areas to the east than the existing runway end lighting. The new lighting is not anticipated to represent a potential for annoyance, affect the viewsheds of areas that may be sensitive to light emissions, nor distract from the existing use of these areas.

Construction work is anticipated to take place primarily during daylight hours and is not anticipated to result in significantly adverse light emissions. The proposed RSA deck is anticipated to be constructed primarily from the water using barge-mounted equipment. Massport would coordinate with the USCG before and during construction to identify appropriate construction equipment lighting, with specific details included in the construction specifications.

3.13.3.2 Visual Resources and Visual Character

No changes or upgrades to the existing airfield lighting systems at the Runway 27 End are anticipated with the Project. The Project would not be expected to alter the overall extent of light emissions within the viewsheds of the potentially sensitive areas near the Airport.

The Project would modify the existing shoreline view at the east end of Runway 27 due to the construction of the pile-supported pier structure in place of the existing ISA. The proposed RSA deck is expected to be similar in appearance to the pile-supported RSA deck at the southwest end (Runway 33L End) of Runway 15R-33L that was completed in 2012. The Runway 27 End does not have an existing runway approach lighting system or light pier extending beyond the runway threshold; the Project would not include new runway approach lighting or light pier construction in Boston Harbor.[52]

52 The Runway 33L End features a Medium Intensity Approach Lighting System with runway alignment indicator lights (MALSR) that are located on a timber pier that extends roughly 1,750 feet beyond the end of the pile-supported RSA deck into Boston Harbor (2,400 feet total distance from the Runway 33L threshold).

The view of the shoreline from the residential neighborhoods to the north and east of the Project is not anticipated to be substantially different than the existing view given the elevation of the proposed deck and in the context of the surrounding Airport environment and East Boston urban setting.

Construction equipment would be temporarily present at the Runway 27 End with the Proposed Project. The visual impacts resulting from construction activities would be temporary and not anticipated to significantly affect the viewsheds in the vicinity of the Runway 27 End.

No changes to the visual character at the Runway 27 End would take place under the No Action Alternative and, therefore, no visual impacts would occur.

3.13.4 Mitigation Measures

No significant visual impacts to the existing environment nor the area viewshed are anticipated with the Project, therefore no mitigation is proposed.

3.14 Water Resources

Water quality and stormwater discharges at Logan Airport are regulated by the NPDES and the Massachusetts Stormwater Policy and Stormwater Management Standards. The NPDES permit program, created by the Clean Water Act 33 U.S.C. Section 1251 et seq, addresses water pollution by regulating point sources that discharge pollutants in stormwater to Waters of the U.S. The NPDES Permit for Logan Airport is an individual permit, tailored to the activities that occur at the Airport, the nature of the stormwater discharge, and the quality of the receiving waters in Boston Harbor and its tributaries.

The MassDEP issued regulations under the WPA that establishes Massachusetts Stormwater Management Standards to encourage treatment and recharge of runoff and prevent stormwater discharges from causing or contributing to pollution of the surface waters and ground waters of the Commonwealth. MassDEP applies the Stormwater Management Standards pursuant to its authority under the WPA (M.G.L., Chapter 131, Section 40) and the Massachusetts Clean Waters Act (M.G.L., Chapter 21, Sections 26-53). The Stormwater Management Standards have been incorporated in the WPA Regulations (310 CMR 10.00) and the Water Quality Certification Regulations (314 CMR 9.00). The 10 Massachusetts Stormwater Management Standards address water quality (pollutants) and water quantity (flooding, low base flow and recharge) by requiring the implementation of a wide variety of stormwater management strategies. These strategies include environmentally sensitive site design and low impact development techniques to minimize impervious surface and land disturbance, source control and pollution prevention, structural best management practices, construction period erosion and sedimentation control, and the long-term operation and maintenance of stormwater management systems.

The current NPDES permit for Logan Airport's stormwater outfalls (NPDES Permit MA0000787) was issued in July 2007 and permit coverage has been administratively continued since that time. The permit controls effluent limitations and includes monitoring requirements for discharges from specified stormwater outfalls. On April 12, 2021, the USEPA issued a new draft NPDES permit to Massport for stormwater discharges from the Airport. It is expected that the NPDES permit will be in place and apply to the Proposed Project once finalized. The draft NPDES permit proposes to limit the amount of pollutants entering Boston Harbor, Boston Inner Harbor, and Winthrop Bay. The draft permit has several

provisions to enhance protection of the environment and public health, in line with current Clean Water Act permits issued within Massachusetts. MassDEP is expected to issue a similar permit to Massport for Logan Airport under the Massachusetts Clean Waters Act.

3.14.1 Affected Environment

The Project Site is flat land that consists of taxiway and runway pavement, a perimeter road, and grassed infields between the paved surfaces. It is along the eastern edge of tidelands previously filled for Logan Airport immediately adjacent to a portion of Boston Harbor. A portion of the site is within the 100-year coastal floodplain as determined by the Federal Emergency Management Agency (FEMA) (DEIR Figure 4-9). Most of the Site is within the Base Flood Elevation (BFE) for Boston Harbor (Zone AE) at Elevation 12 feet, NAVD. Portions of the Site are within velocity zones (Zones VE 13 and 15 feet) indicating potential wave action above the BFE. Stormwater from the Project Area currently either sheet flows off around the perimeter of the airfield or is collected in a series of stone trenches within the grass infields connected of catch basins. The catch basins discharge to Boston Harbor at two outfalls at stabilized areas around the shoreline. The outfalls are fitted with tide gates to prevent infiltration by sea water into the piping system during high tides. Improvement to runoff water quality is currently provided by frequent pavement sweeping, vegetated filter strips or crushed stone slopes along the pavement. Water is allowed to infiltrate in the grassed infields and crushed stone and any excess flow is collected in the stone trenches and catch basins for discharge.

3.14.2 Environmental Consequences

Under the No Action Alternative, no changes would be made to the existing RSA and the perimeter road would remain in its current configuration. Existing drainage areas would not be altered, and no new stormwater management features would be constructed.

The Proposed Project would include construction of new paved surfaces, new crushed stone areas, and construction of the RSA deck out into Boston Harbor. Under the Proposed Project, work would occur within a 97,200 square foot area mapped as coastal floodplain. The Project will generally maintain the existing elevation and not significantly reduce floodplain volume. Much of this work will be within the coastal floodplain and will result in increased impervious surface with additional rate and volume of stormwater runoff. The floodplain and receiving waters are tidal and proposed activities will not affect the level of Boston Harbor or flooding. The minor additional runoff rates and volumes, if any, will not influence flood elevations.

The work within coastal floodplain will largely maintain the existing ground elevations. This will result in minimal filling or loss of floodplain storage volume. Some minor changes in elevation may be required once the final design is prepared; however, any filling of the coastal floodplain will not impact future tidal flood elevations.

The RSA would be constructed on a pile-supported deck that would not generate pollutants that could be released into Boston Harbor, nor would it receive substantial vehicle traffic or other sources of potential pollutants. Limited amounts of erosion would occur because of scour at the bottom of the pilings. Currents in the vicinity of the proposed deck would not be significantly altered. The analysis of sediment transport and scour has demonstrated the erosive forces will not be changed in the vicinity of the

Proposed Project. The proposed Runway 27 End RSA Improvements would result in negligible impacts to turbidity and pollutant loading in Boston Harbor because it would not increase pollutant loading in the waters off the runway end. The proposed Runway 27 RSA would not change the number of aircraft or ground vehicle operations, and accordingly would not result in a change in generation of local pollutants or the discharge of pollutants from atmospheric deposition resulting from the proposed improvements.

3.14.3 Mitigation Measures

Once the Project design has been finalized, a stormwater report will be prepared and included in the Notice of Intent application. The stormwater report will describe the stormwater management measures and address each of the 10 Stormwater Management Standards with supporting calculations. The following is a discussion of the Project's compliance with the Stormwater Management Standards based on the preliminary design.

The Project would create approximately 178,671 square feet of new impervious area from four sources, which will each be managed differently as described below.

- Runoff from the RSA deck (138,370 square feet) would be collected in scuppers along each side of the deck and connected to trunk lines to carry the runoff to the outer end of the deck to be released into deep water (17 to 22 feet deep).
- Runoff from the runway approach and shoulders (17,220 square feet) would be allowed to sheet flow off to the north and south sides of the Project Site to infiltrate into the existing crushed stone between the shoulders and the emergency egress ramps.
- Runoff from the relocated perimeter road would be allowed to sheet flow off the roadway surface to the east and west. The east side would consist of a new field of crushed stone and the runoff would be allowed to infiltrate. To the west, stormwater would runoff to the existing grass surface. Any excess water would be collected in an existing catch basin in the grass, which discharges to an existing outfall to Boston Harbor.
- Runoff from the approaches to the emergency egress ramps (3,065 square feet) would run downhill to the east onto the concrete paver ramps and infiltrate in the stone bedding.

The RSA deck will not experience vehicle traffic or other contaminating uses. Any snow removal would be done by physical removal from the EMAS bed without use of chemicals. The stormwater runoff from the deck will be clean unimpacted water and does not require treatment prior to discharge. The perimeter roadway may be treated with sodium acetate for snow removal and will be frequently swept. Runoff from the perimeter road will sheet flow onto grassed surfaces or crushed stone and allowed to infiltrate.

As part of the previous Runway 33L RSA Project, MassDEP identified the need for treatment of stormwater. MassDEP also recognized that constraints exist that preclude installing stormwater treatment measures at the runway ends. During final design, Massport will investigate additional stormwater management measures to address the addition of impervious area from this Project. Any additional stormwater measures will be part of the final design for the Project and will be presented in the appropriate permit applications.

1. *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

The stormwater runoff from the RSA deck will be a new discharge but will be clean unimpacted water. Discharges from the other areas will sheet flow onto grass or stone covered surfaces. The deck will simply divert clean stormwater runoff to Boston Harbor.

2. *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

A waiver from the post-development peak discharge rates will be requested. The receiving waters are tidal and will be unaffected by any increase in the rate of runoff.

3. *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type.*

Much of the stormwater will be allowed to sheet flow onto grass and stone covered permeable surfaces and allowed to infiltrate. However, the Project site is surrounded on three sides by tidal waters and groundwater levels are already naturally high in the soil and the site does not contribute to a regional groundwater or aquifer system.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).*

Runoff from the deck should be considered clean and treatment is unwarranted. The other new impervious surfaces will sheet flow onto grassed or stone covered surfaces and allowed to infiltrate. Paved surfaces including the perimeter road, runway apron and runway shoulders will be frequently swept to prevent sand, stones, or debris from damaging aircraft. The stormwater report for the final design will document proposed stormwater management measures and the TSS removal rates that will be anticipated for each treatment train.

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.*

Logan Airfield is not a Land Use of Higher Potential Pollutant loading.

6. *Critical Areas - Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.*

Logan Airport is not within a Zone II or I WPA, however receiving waters in Boston Harbor are shellfish growing areas and are considered a Critical Area. As noted, the runoff from the RSA deck should be considered clean. Runoff from the paved surfaces will be treated by sheet flowing to grassed or crushed

stone and allowed to infiltrate. Other measures may also be proposed to address treatment of the appropriate Water Quality Volume.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

Portions of the Project will be redevelopment and portions will be new development. The Stormwater Management Report to be developed for the final design will document compliance with each standard whether to the maximum extent practicable or full compliance.

8. *A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

An erosion control plan will be developed for the final design that will include perimeter erosion controls along the top of the shoreline and details for the use of turbidity curtains for in-water construction activities. This will include use of erosion controls around stockpiles and temporary and permanent stabilization measures to be used during the construction period and between construction years.

9. *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

Massport has developed a Long-Term Operations and Maintenance Plan for Logan Airport that address the perimeter roads, taxiways, runways, gate areas, roadways, and parking lots. This plan includes measures to inspect and clean stormwater features throughout Logan Airport and will be applied to the RSA Project area.

10. *All illicit discharges to the stormwater management system are prohibited.*

There are no sanitary waste pipelines in the vicinity of the Project site, and none will be installed by this Project. No new stormwater drainage pipes or outfalls are planned so there is no opportunity to create an illicit connection to the stormwater system.

3.15 Cumulative Impacts

The CEQ Regulations define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (see 40 CFR § 1508.7). Cumulative impacts can be viewed as the total combined impacts on the environment of the proposed action and other known or reasonably foreseeable actions within a defined timeframe and geographical area.

A cumulative impacts analysis is meant to determine if the cumulative effects exceed the threshold of significance for a particular resource and therefore require either avoidance or mitigation. Reasonably foreseeable future actions are actions that the proponent has committed to completing within the same timeframe as the implementation of the Proposed Project.

Massport's 2020/2021 EDR identified past, present, and reasonably foreseeable future projects at Logan Airport and summarizes their environmental impacts.[53] This analysis included the Runway 27 safety project and concluded that there were no significant cumulative impacts. The Project does not include any increase in airfield capacity that would lead to future increases in development, or aircraft or traffic volumes. The Project would result in expenditures on construction and manufacturing labor and materials, which would provide beneficial short-term impacts to the local economy.

3.15.1 Airport Past and Recently Completed Projects

Past and recently completed projects in the vicinity of the Project Site at Logan Airport described in detail in the 2020/2021 EDR include:

- **Airside:** In 2020, Massport performed a safety rehabilitation of Runway 9-27 to enhance the surface of the runway. In anticipation of the proposed Runway 27 End RSA improvements, the runway threshold was raised 10 inches from its existing elevation to account for potential RSA construction extending out over Boston Harbor, sea level rise, and to protect the runway from flooding due to increased precipitation.

3.15.2 Airport Projects Underway

Most of the projects underway at Logan Airport involve routine maintenance and improvements. Periodically, other larger facility improvements are underway. Projects underway at the time of this Draft EA/Final EIR, organized by Airport area, include:

- **Airside:** A safety rehabilitation of Runway 15R-33L is planned for construction in 2023, before construction is scheduled to begin on the RSA Project in 2025.
- **Landside**: Construction of four additional aircraft gates at Terminal E is underway as part of Phase 1 of the Terminal E Modernization Project, which is expected to be complete by the end of 2023. Phase 2 is anticipated to ultimately add three additional gates at Terminal E, for a total of seven gates. The Terminal E Modernization Project is located on the north side of the airport and there is no overlap in areas of construction with the proposed Runway 27 End RSA Improvements. Also underway is the Terminal C Canopy, Connector, and Roadway Project. The Terminal C to B Connector and Canopy was completed in 2022 and roadways are anticipated to be complete by summer 2023.
- **Service Area:** Construction of a fifth jet fuel storage tank in the North Service Area immediately adjacent to the existing tanks and fuel distribution facilities began in 2022 with an expected 2024 completion date.

The projects will result in temporary construction-period increases in air emissions and noise, but these are not anticipated to result in significant cumulative effects. All contractors will be required to adhere to Massport's rules for construction equipment.

53 Massachusetts Port Authority, *2020/2021 Environmental Data Report*, Boston Logan International Airport, EEA #3247, Chapter 3, "Airport Planning," November 2022, https://www.massport.com/logan-airport/about-logan/environmental-reports/.

3.15.3 Airport Reasonably Foreseeable Projects

Short-term projects planned to be completed by the end of 2025 and long-term projects planned to be completed by the end of 2035 are described in the 2020/2021 EDR.[54] Foreseeable airfield maintenance and upgrade projects planned for the same years as the Runway 27 End RSA Improvements are anticipated to occur outside of the Project's planned construction schedule so as not to cause any concurrent airfield impacts. If areas of construction could take advantage of Runway 9-27 being closed (i.e., electrical infrastructure installation such as lighting upgrades or duct banks), the work would be coordinated to minimize impacts to the travelling public. These projects are summarized in **Table 3-12**.

Table 3-12 Logan Airport Projects Anticipated During Proposed Project Construction

Project	Construction Period
Airfield Electrical Upgrades	2025
Rehabilitate Taxiway A North	2025
Second Airfield Lighting Vault Infrastructure and Building	2025-2027
Rehabilitate Taxiway M North and Associated Geometry Improvements (Taxiways R and Y)	2026
Rehabilitate Taxiway B East and South	2026

Source: Massachusetts Port Authority, May 2022.

3.15.4 Off Airport Projects

The Sumner Tunnel, a main access route from the Airport is undergoing restoration through the end of 2023 requiring weekend closures, and a full closure between May and September 2023. This project will be complete prior to commencement of the Proposed Project. Massport is not aware of other major off-airport projects anticipated during the Runway 27 RSA Improvement Projects.

3.15.5 Summary

The Runway 27 RSA Improvement Project is not anticipated to result in significant cumulative impacts to any environmental resource. This safety project was designed to avoid and minimize adverse impacts to the maximum extent practicable. None of the projects that are underway or are reasonably foreseeable will occur within marine resources, and there will be no cumulative effects.

54 Massachusetts Port Authority, *2020/2021 Environmental Data Report*, Boston Logan International Airport, EEA #3247, Chapter 6, "Noise Abatement," November 2022, https://www.massport.com/logan-airport/about-logan/environmental-reports/.

This Page Intentionally Left Blank

4

Proposed Mitigation and Draft Section 61 Findings

4.1 Introduction

According to the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Implementing Regulations (40 Code of Federal Regulations [CFR] 1500.1(a)), all agencies of the federal government shall:

> "Use all practicable means and measures to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."[1]

In accordance with NEPA regulations, this chapter identifies and evaluates measures that would avoid or minimize impacts by limiting the degree or magnitude of the Project and its implementation. As documented, impacts to environmental resources are unavoidable due to the location of the existing Runway 27 End Runway Safety Area (RSA); therefore, measures that minimize adverse impacts are identified. A detailed analysis of proposed compensatory mitigation measures is included for areas in which replacing lost resources is necessary.

The Massachusetts Environmental Policy Act (MEPA) regulations, at 301 Code of Massachusetts Regulations (CMR) 11.07(j), also outline mitigation measures to be addressed in the Environmental Impact Report (EIR) process, including an "assessment of physical, biological and chemical measures and management techniques designed to limit negative environmental impacts or to cause positive environmental impacts during development and operation of a Project." The Commonwealth of Massachusetts, Secretary of the Executive Office of Energy and Environmental Affairs (EEA) issued a Certificate on the Draft Environmental Impact Report (DEIR) on August 29, 2022, which included requirements for the scope of the Final EIR. The Certificate required that the Final EIR include a separate chapter that:

- Summarizes all proposed mitigation measures including construction-period measures.

1 Council on Environmental Quality, *National Environmental Policy Act Implementing Regulations* (40 CFR Parts 1500-1508), May 20, 2022, https://ceq.doe.gov/docs/laws-regulations/NEPA-Implementing-Regulations-Desk-Reference-2022.pdf.

- Includes a comprehensive list of commitments made by the Proponent to avoid, minimize, and mitigate the environmental and related public health impacts of the Project, including a separate section outlining mitigation commitments relative to environmental justice (EJ) populations.
- Includes separate proposed Massachusetts General Law (M.G.L.) Chapter 30, Section 61[2] findings for each state agency action with a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, identification of the parties responsible for implementation, and a schedule for implementation.
- Provides a list of commitments in a tabular format organized by subject matter and identifies the Agency Action or Permit associated with each category of impact.
- Clearly indicates which mitigation measures will be constructed or implemented based upon Project phasing to ensure that adequate measures are in place to mitigate impacts associated with each development phase.

This chapter provides a description of Massport's proposed commitments to mitigation during construction, for compensatory mitigation for impacts to Land Containing Shellfish, draft Section 61 findings, and information requested in the MEPA Certificate, as well as a description of consultation with federal and state agencies pertaining to mitigation.

4.2 Project Mitigation Commitments

As described throughout this Draft Environmental Assessment (EA)/Final EIR, from Project inception, the Federal Aviation Administration (FAA) and Massport have strived to meet the critical aviation safety need of the Project, to appropriately balance the direct and indirect natural resources impacts of the safety improvements, and to seek effective mitigation strategies. This iterative process will continue to identify and incorporate additional avoidance and minimization strategies through design and construction. Impacts to natural resources are unavoidable for any of the RSA improvement alternatives that would meet FAA's design criteria, as demonstrated in Chapter 2, *Proposed Action and Alternatives*. The evaluation of alternatives focused on options that minimized unavoidable impacts to coastal wetland resource areas to the extent practicable. **This Project is a required FAA safety project that will not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway.** The impacts are due to the construction and final condition of this Project and no changes to airport operations are proposed. This section describes efforts to avoid and minimize impacts and provide compensatory mitigation for unavoidable impacts to coastal wetland resource areas.

4.2.1 Coastal Wetland Resource Areas

The EEA Secretary's Certificate required that mitigation measures to offset impacts to coastal wetland resource areas be included in the Final EIR. This section describes proposed avoidance, minimization, and mitigation measures for coastal wetland resource areas and their associated costs.

2 Massachusetts General Law, Chapter 30, Section 61: *Determination of Impact by Agencies; Damages to Environment; Prevention or Minimization; Foreseeable Climate Change Impacts*, https://malegislature.gov/Laws/GeneralLaws/PartI/TitleIII/Chapter30/Section61.

4.2.1.1 Avoidance

The Project is part of a continuing safety program and is required to improve the RSA consistent with FAA's airport design standards,[3] and to enhance rescue access in the event of an emergency. Therefore, although the No Action Alternative would avoid impacts to coastal resource areas, it would not meet the purpose and need for the Proposed Project.

4.2.1.2 Minimization

To minimize environmental impacts to Boston Harbor, FAA determined that the preferred option for the Runway 27 End RSA is an approximately 650-foot-long RSA with an Engineered Materials Arresting System (EMAS) on a pile-supported deck (approximately 450 feet long by 306 feet wide). This fundamental "minimization" decision to construct an EMAS on a pile-supported deck avoided the need for a larger intrusion into Boston Harbor on a larger deck or filled structure. Having the minimum deck size established by FAA, Massport evaluated four deck support options based on the pile arrangement or type of support pile (pile or caisson). As described in Chapter 2, Deck Support Alternative 2, which features a pile configuration of 326 twenty-inch square concrete piles, was the Preferred Alternative because:

1. It has the smallest total direct impact (footprint) to coastal wetland resource areas,
2. It would take the shortest time to construct, thereby reducing indirect impacts related to in-water construction activities, and
3. It has the least direct and indirect impacts of the deck support designs that were considered.

During pile driving activities, the Project work area would be surrounded with a turbidity curtain to contain any sediment resuspended by construction activities. In addition, at the direction of state and federal environmental resource agencies, in-water construction will avoid the winter flounder time-of-year (TOY) restriction from February 15 to June 30.

4.2.1.3 Compensatory Mitigation

The proposed 306-foot-wide RSA deck at the Runway 27 End would extend approximately 450 feet over Boston Harbor. There is no salt marsh or eelgrass within the Study Area that would require replacement. The area is subject to federal jurisdiction as Waters of the U.S., as well as regulated by the state as Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, and Land Under the Ocean. Because the RSA deck will be elevated, the direct alteration of marine resources would be restricted to the footprint of the pilings and would occur in the following resource types: Land Subject to Tidal Action, Land Under the Ocean, Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish (see Table 3-4 in Chapter 3, *Affected Environment and Environmental Consequences*, for totals). Direct impacts to the shoreline and seabed (below annual high water) from the deck piles and the emergency egress ramps would be approximate square feet, or less than one percent of the Project Site. The adjacent emergency egress ramps would generally convert previously disturbed Coastal Bank to a more stabilized surface. Approximately 3.2 acres of intertidal and subtidal area would be overshadowed by the proposed deck. The area beneath the deck would still be subject to the ebb and flood of tidal waters and would still

3 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

provide suitable benthic and intertidal habitat. Since the Project will likely be considered non-water dependent in a state Chapter 91/Waterways context, the Project must demonstrate no adverse impacts to Land Under the Ocean or Land Subject to Tidal Action. The Massachusetts Wetlands Protection Act (WPA) resource area performance standards are addressed in Chapter 3, *Affected Environment and Environmental Consequences*, and demonstrate that although there will be some loss of habitat, there will not be a significant impact from the Project. Loss of Land Containing Shellfish due to the installation of pilings and the emergency egress ramps will result in an approximately 1,200-square-foot reduction in shellfish habitat that could reduce commercial value for badged shellfishers. While harvestable densities of soft shell clam resources in and adjacent to the proposed safety area expansion are depressed due to disease, the Massachusetts Division of Marine Fisheries (DMF) has indicated mitigation is required and likely in the form of a mitigation fee to a state shellfish habitat restoration program.

The mud flat habitat that includes the coastal beach and the lower intertidal zone is a special aquatic site and the U.S. Army Corps of Engineers (USACE) requires lost habitat be mitigated by replacement of lost area or by payment of an in-lieu fee. The in-lieu fee program charges a per square foot fee based on the impact area. The fee is based on the cost to create similar habitat from an upland site. The collected fee is provided to a state agency and must be used on ecological restoration projects.

Massport has committed to provide replacement/restoration of soft bottom intertidal and subtidal habitat to offset Project related loss of habitat. A plan for replacement of the intertidal and subtidal area impacted by the Project will be included in the future permit applications. Massport proposes a wetland mitigation goal of 1:1 restoration or replacement of 1,200 square feet of filled wetland area (piles and emergency egress ramps) via construction or restoration of mud flat based on current USACE and Massachusetts Department of Environmental Protection (MassDEP) guidance. In close coordination with the resource agencies, mud flat mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. The proposed RSA deck will overshadow coastal wetland resources, but they will continue to provide functional value such as habitat, storm damage prevention, protection of land containing shellfish, and protection of fisheries.

4.2.1.4 Mitigation Costs

The cost of the mitigation will be confirmed during the permitting process with the DMF and USACE. The USACE currently uses an in-lieu fee of $14.26 per square foot. For 1,200 square feet of impact, the estimated in-lieu fee would be approximately $17,200. A mitigation fee for the DMF has not been determined and the cost of constructing or restoring the intertidal or subtidal habitat has not been determined.

4.3 Construction Period Mitigation Measures

This section addresses the requirements of the Certificate to summarize all construction-based mitigation measures.

4.3.1 Coastal Wetland Resources

Several measures would be used during construction to mitigate the impacts on the environment and Boston Harbor. A TOY restriction would be followed for in-water construction activities that have the potential for producing turbidity. During the TOY restriction between February 15 and June 30, no in-water turbidity producing work, such as pile driving, will occur. During active turbidity-producing work, a floating turbidity curtain will be installed around the work area to contain any turbidity that is generated. In addition, pile driving activities will include measures to minimize noise such as soft starts and buffering blocks on the top of the piles.

As described in DEIR Appendix H, *Draft Construction Management Plan*,[4] most of the pile-driving work would be conducted by equipment operating from barges. During construction, the barges would not be allowed to ground during low tide. As necessary, the barges would be moved to deeper water during low tide, until the rising tide provides adequate water depth for the barges to be relocated inshore.

As noted above, the Proposed Action (Deck Support Alternative 2) is the alternative with the fewest piles and shortest in-water work schedule. Approximately 45 days are needed to complete the pile driving needed for the RSA deck. The condensed project schedule, which includes two separate 60-day construction periods for 120 days total with work scheduled to take place seven days per week, would reduce the duration of impact to marine resources.

4.3.2 Public Access/Navigation

The RSA improvements would occur near an active navigation channel that provides public boating access to Belle Isle Inlet and other areas of Winthrop and East Boston. Although near the channel, at its closest point, the proposed RSA deck would be approximately 175 feet away from the edge of the channel. During construction, most of the equipment and materials would be brought to the Project Site by barge or other water borne transport. These vessels may occupy portions of the navigation channel intermittently but would not preclude use of the channel by the public. As the RSA deck is constructed, a maneuvering barge may periodically enter the navigation channel. A maneuvering barge may temporarily restrict a portion of the channel, but public use would not be completely restricted.

Logan Airport is surrounded by a legislated 500-foot security zone that restricts access by individuals that have not received a valid security access badge. Badged shellfishers under the guidance of DMF are, however, allowed onto the airport property, with proper notice, to harvest clams from the conditionally restricted mud flats. As occurred for the Runway 33L RSA deck, during construction, these shellfishers would be temporarily restricted from access to the active work zone. Following construction, shellfishers would have access as previously allowed.

Massport has coordinated with U.S. Coast Guard (USCG) to discuss impacts to the navigation channel as well as ensure that the Logan Airport Security Zone and deck are adequately marked. The USCG would be notified whenever a construction barge enters the navigation channel. The USCG additionally recommended relocating and adding buoys that mark the Logan Airport Security Zone as well as adding

4 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Appendix H, "Draft Construction Management Plan," June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

yellow or white lights to the end of the deck for visibility. As design advances, Massport will continue to coordinate with the USCG to address any project-related issues within their jurisdiction.

4.3.3 Water Quality

Measures would be taken to avoid water quality impacts from construction. These include, as part of the requirements for the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, developing and implementing a Stormwater Pollution Prevention Plan and a Soil Erosion and Sediment Control Plan. Measures to be included in the Plan would include:

- Use of sediment control methods (such as silt fences and biodegradable fiber rolls) to prevent silt and sediment entering the stormwater system and waterways.
- Application of water to dry soil to prevent fugitive dust.
- Stabilization of highly erodible soil, if any, with erosion control blankets or similar stabilization methods.
- Maintenance of equipment to prevent oil and fuel leaks.
- Silt curtains around in-water work, such as pile installation.

4.3.4 Transportation

Transport to the Project Site for most of the construction equipment, supplies, and workers would be via barge or boat. The Airport roadways can support the anticipated construction-related traffic; therefore, no specific mitigation is proposed, and no Project-specific transportation access plan is proposed. Massport requires all contractors to limit construction-related traffic to access and egress through the secured North or South airfield gates using only state and federal highways and the Airport roadway network, prohibiting construction related traffic on the local East Boston roadways.

Massport recommends that contractors implement construction worker vehicle trip management, including requiring off-Airport parking and high-occupancy vehicle transportation modes for workers.

4.3.5 Noise

The Project would not result in significant impacts from construction equipment, however, depending on the specific machinery, Massport will consider the following measures to reduce the effects of construction noise on adjacent noise sensitive areas:

- Provide appropriate manufacturer's noise reduction devices, including, but not limited to a manufacturer's muffler (or equivalently rated material) that is free of rust, holes, and exhaust leaks on construction equipment operating on-site.
- Ensure that the engine housing doors are kept closed on construction devices with internal combustion engines.
- Cover equipment, such as compressors, generators, pumps, and other such devices with noise insulating fabric as well as operate the device at lower engine speeds during work to the maximum extent possible.

- Use operational controls, such as limiting vehicle engine idling on-site and time-of-day restrictions for certain activities.
- Strategically position construction vehicles so as to minimize operation near noise sensitive receptors and direct construction haul vehicles away from noise sensitive receptors when traveling to and from the work site.
- Use noise pathway controls where possible, including temporary noise barriers and enclosures free from gaps and holes, placed as close as possible to construction areas.
- Keep the public informed about construction activities and efforts to minimize noise in the community.
- Use the Massport Noise Complaint system for prompt response and corrective action to noise complaints during construction.

4.3.6 Air Quality

Estimated emissions from equipment in each year that construction would occur would be minor and temporary. Emissions would be below any applicable federal General Conformity *de minimis* thresholds as Suffolk County is an Attainment area for all current National Ambient Air Quality Standards (NAAQS). For fugitive dust emission sources, the PM_{10} and $PM_{2.5}$ emissions estimate include the use of dust suppression techniques as standard practice (primarily application of water) to reduce dust emissions by 75 percent. Construction equipment will be maintained according to manufacturer's specifications and operated using U.S. Environmental Protection Agency (USEPA) compliant fuels for on road and off-road equipment and vehicle applications to minimize emissions. Construction equipment will also be required to comply with the Massachusetts anti-idling law.

4.3.7 Environmental Justice

There would be no disproportionate adverse effects or increased climate change risks to EJ populations. Therefore, no specific mitigation to EJ populations is required. While no mitigation is required, Massport commits to continue EJ outreach in accordance with these applicable federal and state policies through future phases of project development, including construction. An updated outreach plan is included in Appendix E.5, *Updated EJ Outreach Plan*, and includes a summary of outreach to date, as well as Massport's commitments to continuing outreach.

4.3.8 Draft Construction Management Plan

DEIR Appendix H contained a draft Construction Management Plan (CMP) that describes project activities, schedule, and sequencing.[5] It included best management practices to avoid and minimize adverse environmental impacts and address potential mitigation related to land disturbance. The CMP also included a disposal plan for excess construction materials.

5 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, Appendix H, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

4.4 Draft Section 61 Findings by Permit

M.G.L. Chapter 30, Section 61 authorizes state agencies with permitting responsibilities to make an official determination regarding potential impacts from a proposed project and whether impacts have been avoided, minimized, and/or mitigated for appropriately. The Law requires agencies/authorities to issue a determination that includes a finding describing the environmental impact, if any, of the project and whether all feasible measures have been taken to avoid or minimize said impact.

This section provides a brief overview of the Project, explains the history of the MEPA review process for the proposed Runway 27 End RSA Improvements Project, outlines required state and federal permits and their authorities, summarizes mitigation commitments for permanent and construction-related impacts, and provides draft Section 61 determination language for state agencies.

4.4.1 Project Description

The Proposed Project includes measures that are part of a continuing safety program and are required to improve the RSA, to the extent feasible, consistent with FAA airport design standards for RSAs,[6] and to enhance rescue access in the event of an emergency. **This Project will enhance safety but will not extend runways nor have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway**.

To minimize environmental impacts to Boston Harbor, in 2019, FAA determined that the preferred option for the Runway 27 End RSA is an approximately 650-foot-long RSA with an EMAS installed on a pile-supported deck (approximately 450 feet long by 306 feet wide). An EMAS is constructed of collapsible concrete blocks with predictable deceleration forces. When, in an emergency, an aircraft rolls into an EMAS, the tires of the aircraft collapse the lightweight concrete, and the aircraft is slowed down in a way that minimizes damage to the aircraft. Because of the irregular shoreline at this area, it is expected that the 306-foot-wide deck would extend approximately 450 feet over Boston Harbor. The option that would not lengthen the existing Runway 9-27 is the subject of the environmental review for this Project. Since the Project, once completed, would not change how Logan Airport operates, this Draft EA/Final EIR focuses on measures to avoid and minimize construction impacts and associated mitigation.

4.4.2 History of MEPA Review

In coordination with FAA, Massport obtained public input throughout the scoping, planning, and analysis of the Project. In accordance with the new MEPA requirements for projects within 1 mile of an EJ community, Massport held a virtual pre-Environmental Notification Form (ENF) filing public meeting on June 29, 2021 after reaching out to local and state elected officials, representatives in East Boston and Winthrop, the Massport Community Advisory Committee (MCAC), and community interest groups. Notice of the meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. The meeting was attended by representatives from State Representative Adrian Madaro's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens.

6 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

In August 2021, Massport submitted an ENF to the Executive Office of Energy and Environmental Affairs (EEA), per MEPA and accompanying regulations (301 CMR 11). The ENF was circulated to interested parties and a Public Notice of Environmental Review was published on September 8, 2021, in accordance with MEPA regulations 301 CMR 11.05 and 301 CMR 11.15. A public scoping meeting was held virtually on September 22, 2021, to solicit public input on development of the DEIR scope. The Secretary issued a Certificate on the DEIR on October 8, 2021, confirming the need to prepare an EIR.

On June 30, 2022, Massport filed a DEIR for the Project with the EEA. A Public Notice of Environmental Review was published in the Environmental Monitor on July 8, 2022, and the DEIR was circulated to those who commented on the ENF and other interested parties. An additional voluntary virtual public meeting was conducted on July 20, 2022, and was attended by representatives from State Senator Ed Markey's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens. The public comment period on the DEIR ended on August 22, 2022. The Secretary of EEA issued a Certificate on the DEIR on August 29, 2022, confirming that the DEIR properly and adequately complied with the MEPA regulations and outlining the scope of the Final EIR. The Secretary's DEIR Certificate can be found in Appendix A, *Response to DEIR Comments*.

This Draft EA/Final EIR was prepared in accordance with the scope outlined in the DEIR Certificate.

4.4.3 Overview of Project Impacts and Mitigation Measures

The Proposed Runway 27 End RSA Improvements Project would result in impacts to Coastal Bank, Coastal Beach, Land Under the Ocean, and Land Containing Shellfish. Massport has proposed compensation for impacts to these resources. Temporary impacts to environmental resources would also be mitigated through contractor equipment specifications, TOY restrictions and silt curtains for in-water work as well as soil and erosion controls to prevent adverse water quality impacts.

4.4.3.1 Permanent Impacts

Permanent impacts resulting from construction of the RSA deck would be mitigated, as described in **Section 4.2.1** and summarized in **Table 4-1**. There would be no impacts to ground transportation, air quality, socioeconomic impacts, EJ, children's health and safety risks, historic resources, Section 4(f) resources, wild and scenic rivers, farmland, natural resources, light emissions, and energy supply. Therefore, mitigation is not required for these resources.

4.4.3.2 Construction Impacts

Temporary, short-term impacts from construction activities would be mitigated to the extent practicable (see **Table 4-1**). Appropriate construction mitigation measures would be incorporated into the contract documents and specifications governing the activities of contractors and subcontractors constructing elements of the Proposed Project. All construction activities would comply with FAA Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports*.[7] On-site resident engineers and inspectors will monitor construction activities to ensure that mitigation measures are properly implemented. These construction-period mitigation measures would be the responsibility of Massport. Specific mitigation measures would be developed during the final design phase of the RSA

7 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports*, December 21, 2018.

Improvements Project and would be reviewed by the appropriate regulatory agencies as part of the permit applications. Construction-period mitigation requirements would be incorporated into the final plans and specifications that would serve as the basis for the construction contract.

Table 4-1 Proposed Mitigation Measures and Commitments

Environmental Categories	Mitigation Measure or Commitment	Approximate Cost	Implementation Schedule	Responsible Party
Land Containing Shellfish	Provide mitigation fee to Massachusetts Division of Marine Fisheries (DMF) for off-site restoration.	TBD	Prior to Construction	Massport
Habitat	Replace lost upland grassland habitat.	TBD	During Construction	Contractor
	Implement winter flounder time-of-year (TOY) restriction from February 15 to June 30 for in-water construction activities.	TBD	During Construction	Contractor
Coastal Wetlands	Provide in-lieu fee (U.S. Army Corps of Engineers [USACE]) for impacts to mud flat.	$17,200	Prior to Construction	Massport
	Provide 1:1 replacement/restoration of intertidal and subtidal wetlands impacted by piles and egress ramps. Mud flat mitigation is expected to be in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End Runway Safety Area (RSA) project at Rumney Marsh in Saugus, Massachusetts.	TBD	During Construction	Massport/ Contractor
Water Quality	Develop and implement a comprehensive Soil Erosion and Sediment Control Plan in accordance with National Pollutant Discharge Elimination System (NPDES) and Massachusetts Department of Environmental Protection (MassDEP) standards.	TBD	Prior to and During Construction	Contractor
	Apply water to dry soil to prevent fugitive dust.	TBD	During Construction	Contractor
	Stabilize any highly erosive soils with erosion control blankets or hydroseeding and other stabilization methods, as necessary.	TBD	During Construction	Contractor
	Use sediment control methods (such as compost filter tubes) to prevent silt and sediment entering the stormwater system and waterways.	TBD	During Construction	Contractor
	Maintain equipment to prevent oil and fuel leaks.	TBD	During Construction	Contractor
	Use turbidity curtains around any in-water construction activities.	TBD	During Construction	Contractor
	Install measures to manage and treat stormwater runoff in compliance with the Massachusetts Stormwater Management Standards.	TBD	During Construction	Contractor
Noise	Maintain mufflers on construction equipment in accordance with Occupational Safety and Health Administration (OSHA) standards.	TBD	During Construction	Contractor

Environmental Categories	Mitigation Measure or Commitment	Approximate Cost	Implementation Schedule	Responsible Party
	Minimize engine idling in accordance with Massachusetts anti-idling regulations.	TBD	During Construction	Contractor
	Fit any air-powered equipment with pneumatic exhaust silencers.	TBD	During Construction	Contractor
	Minimize nighttime construction.	TBD	During Construction	Contractor
	Minimize noise during pile driving activities where possible.	TBD	During Construction	Contractor
Transportation	Implement construction worker vehicle trip management techniques	TBD	During Construction	Contractor
Air Quality and Greenhouse Gas Emissions	Keep truck idling to a minimum in accordance with Massachusetts anti-idling regulations.	TBD	During Construction	Contractor
	Retrofit appropriate diesel construction equipment with diesel oxidation catalysts and/or particulate filters.	TBD	During Construction	Contractor
	Implement construction worker vehicle trip management techniques	TBD	During Construction	Contractor
Hazardous Materials and Solid Waste	Pre-characterize any materials excavated from the Study Area and require disposal (if any) to determine course of action for removal.	TBD	During Construction	Contractor
Public Outreach/ Environmental Justice (EJ)	Commit to continuing outreach to the public, including EJ communities, throughout all future phases of project development and construction in accordance with federal and state requirements.	TBD	All future phases	Massport

TBD - To be determined

4.4.4 Draft Section 61 Findings

4.4.4.1 State Agency Actions

In addition to compliance with NEPA and MEPA, there are local, state, and federal permits needed for the Project, as listed in **Table 4-2**. Chapter 3, *Affected Environment and Environmental Consequences*, provides additional Project details relative to the Project impacts.

Table 4-2 Potential State Actions

Agency/Department	Permit/Approval/Action	Status/Timeframe
Commonwealth of Massachusetts		
Coastal Zone Management	Consistency Statement with Massachusetts Coastal Zone Management Plan	To be obtained prior to construction.
Massachusetts Department of Environmental Protection	Individual Water Quality Certification	If required, prior to construction.
	Chapter 91 Waterways Program License Modification	To be obtained prior to construction.
Massachusetts Natural Heritage and Endangered Species Program	Conservation and Management Permit (if required)	If required, prior to construction.

Note: This is a preliminary list of permits and approvals that may be sought for the Project based on current information and is subject to change as the design of the Project evolves.

4.4.4.2 Massachusetts Office of Coastal Zone Management (CZM)

Project Name: *Runway 27 End RSA Improvements Project*

Project Location: *Boston Logan International Airport (Logan Airport), East Boston, Massachusetts*

Project Proponent: *Massachusetts Port Authority (Massport)*

EEA Number: *16433*

Date Noticed in Monitor: *December 23, 2022*

Applicable State Action/Permit

- *Consistency Statement with Massachusetts Coastal Zone Management Plan*

This Section 61 Finding for the Runway 27 End RSA Improvements Project (EEA 16433) has been prepared in accordance with the provisions of M.G.L. Chapter 30, Section 61 and 301 CMR 11.07(6)(k).

The potential environmental impacts of the Project are characterized and quantified in the Logan Airport Runway 27 End Runway Safety Area (RSA) Improvements Project Draft Environmental Assessment (Draft EA)/Final Environmental Impact Report (Final EIR), which is incorporated by reference into this Section 61 Finding. To the greatest extent practicable, Massport has taken all feasible measures to avoid and/or minimize adverse environmental impacts of the Project. Where impacts are not avoidable, Massport has worked throughout the planning and environmental review process to develop measures to mitigate impacts of the Project to the extent practicable. With the implementation of the proposed mitigation, and cooperation with federal and state agencies, the Massachusetts Office of Coastal Zone Management (CZM) finds that there are no significant unmitigated impacts.

Massport recognizes that the identification of effective mitigation, and implementation of that mitigation throughout the life of the Project, is central to its responsibilities under Massachusetts Environmental Policy Act (MEPA). Accordingly, Massport has prepared a Table of Mitigation Commitments (Table 4-3) that specifies, for each potential state permit, the mitigation that Massport would provide. In the Table of Mitigation Commitments, Massport provides clear commitments to implement the mitigation measures; identifies the parties responsible for implementation of measures; identified estimated cost (where available) and provides a schedule for their implementation based upon Project phasing.

CZM has reviewed the MEPA filings and finds that the environmental impacts resulting from construction of the Project are those impacts as described in the Final EIR, which would be updated as needed in permit applications submitted for compliance with federal and state environmental laws. Pursuant to M.G.L. Chapter 30, Section 61, CZM finds that with the implementation of mitigation measures as identified in the Table of Mitigation Commitments, all practicable and feasible means and measures would have been taken to avoid or minimize potential damage to the environment due to the construction and operation of the Project. In making this finding, CZM has considered reasonably foreseeable climate change impacts and environmental justice impacts.

Coastal Zone Management

As discussed in Section 3.4.4 of Chapter 3, *Affected Environment and Environmental Consequences*, the Proposed Project would involve permanent impacts to coastal wetlands subject to federal jurisdiction as Waters of the U.S, and as well as state-regulated resource areas including Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, and Land Under the Ocean. The direct alteration of these resources would be restricted to the actual footprint of the pilings and would be approximately

880 square feet of Land Subject to Tidal Action and Land Under the Ocean, and includes Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish. An additional 9,460 square feet of coastal resources would be altered by the emergency egress ramps. Most of this area has been previously altered. Mitigation for Project impacts would include 1:1 replacement or restoration of 1,200 square feet of filled wetland area, in-lieu fee, providing funding to DMF's shellfish restoration program, and a 1:1 replacement of impacted upland grassland habitat. These impacts and associated mitigation measures are summarized in **Table 4-3**.

Table 4-3 Coastal Zone Impacts and Mitigation

Estimated Impact	Mitigation	Responsible Party/ Schedule
Permanent Impacts		
1,200 square feet of Coastal Beach (mud flat) and Land Under the Ocean	Wetland mitigation, with a 1:1 replacement or restoration of 1,200 square feet of filled wetland area (associated with piles and emergency egress ramps) via construction or restoration of mudflat based on U.S. Army Corps of Engineers (USACE) and Massachusetts Department of Environmental Protection (MassDEP) guidance. Mud flat mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End Runway Safety Area (RSA) project at Rumney Marsh in Saugus, Massachusetts. Provide in-lieu fee USACE for impacts to mud flat.	Massport/ Pre-Construction and During Construction
Total impact of 66,760 square feet to Land Containing Shellfish	Contribute funding to Massachusetts Department of Marine Fisheries (DMF) shellfish restoration program.	Massport/ Pre-Construction
Construction Period Impacts		
Potential impacts to winter flounder	In-water time of year restriction for silt producing construction activities of February 15 to June 30. Turbidity curtains will be used to surround the in-water work area to contain any turbidity that may be created by the construction activities.	Massport and Contractor/ During Construction
Noise impacts from pile driving that could potentially impact biological resources	A vibratory pile driver will be used as much as possible, and a ramp up or soft start for hammer driving with padding on top of the pile will lessen noise impacts.	Contractor/ During Construction

4.4.4.3 Massachusetts Department Environmental Protection

Project Name: *Runway 27 End RSA Improvements Project*

Project Location: *Boston Logan International Airport (Logan Airport), East Boston, Massachusetts*

Project Proponent: *Massachusetts Port Authority (Massport)*

EEA Number: *16433*

Date Noticed in Monitor: *December 23, 2022*

Applicable State Action/Permit

- *Section 401 Water Quality Certificate*
- *Chapter 91 License*

This Section 61 Finding for the Runway 27 End RSA Improvements Project (EEA 16433) has been prepared in accordance with the provisions of M.G.L. Chapter 30, Section 61 and 301 CMR 11.07(6)(k).

The potential environmental impacts of the Project are characterized and quantified in the Logan Airport Runway 27 End Runway Safety Area (RSA) Improvements Project Draft Environmental Assessment (Draft EA)/Final Environmental Impact Report (Final EIR), which is incorporated by reference into this Section 61 Finding. To the greatest extent practicable, Massport has taken all feasible measures to avoid and/or minimize adverse environmental impacts of the Project. Where impacts are not avoidable, Massport has worked throughout the planning and environmental review process to develop measures to mitigate impacts of the Project to the extent practicable. With the implementation of the proposed mitigation, and cooperation with federal and state agencies, the Massachusetts Department of Environmental Protection (MassDEP) finds that there are no significant unmitigated impacts.

Massport recognizes that the identification of effective mitigation, and implementation of that mitigation throughout the life of the Project, is central to its responsibilities under Massachusetts Environmental Policy Act (MEPA). Accordingly, Massport has prepared a Table of Mitigation Commitments (Table 4-4) that specifies, for each potential state permit, the mitigation that Massport would provide. In the Table of Mitigation Commitments, Massport provides clear commitments to implement the mitigation measures; identifies the parties responsible for implementation of measures; identified estimated cost (where available) and provides a schedule for their implementation based upon Project phasing.

MassDEP has reviewed the MEPA filings and finds that the environmental impacts resulting from construction of the Project are those impacts as described in the Final EIR, which would be updated as needed in permit applications submitted for compliance with federal and state environmental laws. Pursuant to M.G.L. Chapter 30, Section 61, MassDEP finds that with the implementation of mitigation measures as identified in the Table of Mitigation Commitments, all practicable and feasible means and measures would have been taken to avoid or minimize potential damage to the environment due to the construction and operation of the Project. In making this finding, MassDEP has considered reasonably foreseeable climate change impacts and environmental justice impacts.

Wetlands and Waterways

As discussed in Section 3.4.3 of Chapter 3, *Affected Environment and Environmental Consequences*, the Proposed Project would involve permanent impacts to coastal wetlands subject to federal jurisdiction as

Waters of the U.S., as well as state-regulated resource areas including Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, and Land Under the Ocean. The direct alteration of these resources would be restricted to the actual footprint of the pilings and would be approximately 880 square feet of Land Subject to Tidal Action and Land Under the Ocean, and includes Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish. An additional 9,460 square feet of coastal resources would be altered by the emergency egress ramps. Most of this area has been previously altered. The entire Project Site is within either filled tideland (airfield) or consists of flowed tidelands (shoreline and Boston Harbor) and is subject to Chapter 91 licensing and permitting for dredging, filling, and any structures. The issuance of a Section 401 Water Quality Certification by MassDEP would be required for the discharges of fill into Waters of the U.S. In accordance with Clean Water Act (CWA) requirements, mitigation would be provided for all proposed permanent wetland impacts. These impacts and associated mitigation measures are summarized in **Table 4-4**.

Mitigation for impacts would include 1:1 replacement of 1,200 square feet of filled wetland area, in-lieu fee, providing funding to DMF's shellfish restoration program, time of year restrictions on in-water construction, turbidity curtains, vibratory pile driver, and ramp up or soft start for hammer driving. Stormwater mitigation measures for the construction-period would be detailed in the Stormwater Pollution Prevention Plan (SWPPP) to be prepared by the contractor prior to construction pursuant to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), which would include:

- Minimization of exposed soils through sequencing work and temporary stabilization.
- Site controls and erosion and sedimentation Best Management Practices (BMPs) could include siltation barriers, temporary sediment basins and stabilized construction entrances to prevent siltation in waterways.
- Use of turbidity curtains around any active in-water construction sites.
- Regular inspection and monitoring of discharges in accordance with NPDES CGP to avoid permanent and indirect effects due to construction site runoff.

Table 4-4 State Wetland and Waterway Resources Impact and Mitigation

Estimated Impact	Mitigation	Responsible Party/ Schedule
Permanent Impacts		
1,200 square feet of Coastal Beach (mud flat) and Land Under the Ocean	Wetland mitigation, with a 1:1 replacement of 1,200 square feet of filled wetland area (piles and emergency egress ramps) via construction or restoration of mudflat based on current U.S. Army Corps of Engineers (USACE) and Massachusetts Department of Environmental Protection (MassDEP) guidance. Mud flat mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. Provide in-lieu fee to USACE for impacts to mud flat	Massport and Contractor/ Pre-Construction and During Construction

Estimated Impact	Mitigation	Responsible Party/ Schedule
Total impact of 66,760 square feet (from shading to Land Containing Shellfish)	Contribute funding to Massachusetts Department of Marine Fisheries (DMF) shellfish restoration program.	Massport/ Pre-Construction
Construction Period Impacts		
Potential impacts to winter flounder	In-water time of year restriction for silt producing construction activities of February 15 to June 30. Turbidity curtains will be used to surround the in-water work area to contain any turbidity that may be created by the construction activities.	Contractor/ During Construction
Noise impacts from pile driving that could potentially impact biological resources	A vibratory pile driver will be used as much as possible, and a ramp up or soft start for hammer driving with padding on top of the pile will lessen noise impacts.	Contractor/During Construction

4.4.4.4 Massachusetts Natural Heritage and Endangered Species Program

Project Name: *Runway 27 End RSA Improvements Project*

Project Location: *Boston Logan International Airport (Logan Airport), East Boston, Massachusetts*

Project Proponent: *Massachusetts Port Authority (Massport)*

EEA Number: *16433*

Date Noticed in Monitor: *December 23, 2022*

Applicable State Action/Permit

- *Natural Heritage and Endangered Species Program (NHESP) Conservation and Management Permit (if required)*

This Section 61 Finding for the Runway 27 End RSA Improvements Project (EEA 16433) has been prepared in accordance with the provisions of M.G.L. Chapter 30, Section 61 and 301 CMR 11.07(6)(k).

The potential environmental impacts of the Project are characterized and quantified in the Logan Airport Runway 27 End Runway Safety Area (RSA) Improvements Project Draft Environmental Assessment (Draft EA)/Final Environmental Impact Report (Final EIR), which is incorporated by reference into this Section 61 Finding. To the greatest extent practicable, Massport has taken all feasible measures to avoid and/or minimize adverse environmental impacts of the Project. Where impacts are not avoidable, Massport has worked throughout the planning and environmental review process to develop measures to mitigate impacts of the Project to the extent practicable. With the implementation of the proposed mitigation, and cooperation with federal and state agencies, NHESP finds that there are no significant unmitigated impacts.

Massport recognizes that the identification of effective mitigation, and implementation of that mitigation throughout the life of the Project, is central to its responsibilities under Massachusetts Environmental Policy Act (MEPA). Accordingly, Massport has prepared a Table of Mitigation Commitments (Table 4-5) that specifies, for each potential state permit, the mitigation that Massport would provide. In the Table of Mitigation Commitments, Massport provides clear commitments to implement the mitigation measures; identifies the parties responsible for implementation of measures; identified estimated cost (where available) and provides a schedule for their implementation based upon Project phasing.

NHESP has reviewed the MEPA filings and finds that the environmental impacts resulting from construction of the Project are those impacts as described in the Final EIR, which would be updated as needed in permit applications submitted for compliance with federal and state environmental laws. Pursuant to M.G.L. Chapter 30, Section 61, NHESP finds that with the implementation of mitigation measures as identified in the Table of Mitigation Commitments, all practicable and feasible means and measures would have been taken to avoid or minimize potential damage to the environment due to the construction and operation of the Project. In making this finding, NHESP has considered reasonably foreseeable climate change impacts and environmental justice impacts.

Threatened and Endangered Species

As discussed in Section 3.4.4 of Chapter 3, *Affected Environment and Environmental Consequences*, the Proposed Project would involve permanent impacts to existing grassland habitat that is a state-listed polygon of priority habitat for upland sandpiper and Eastern meadowlark. A Conservation and Management Permit would be required if impacts constitute a take for the two upland grassland State-

listed species. Mitigation for impacts would include a 1:1 replacement of impacted upland grassland habitat. These impacts and associated mitigation measures are summarized in **Table 4-5**.

Table 4-5 State Threatened and Endangered Species Impact and Mitigation

Estimated Impact	Mitigation	Responsible Party/ Schedule
Permanent Impacts		
Loss of upland grassland habitat (20,300 square feet)	Replace lost upland grassland habitat by removing existing pavement.	Contractor/ During Construction
Construction Period Impacts		
Alteration of upland grassland habitat (22,000 square feet)	Restore upland grassland habitat disturbed by construction.	Contractor/ During Construction

This Page Intentionally Left Blank

Appendices

Appendix A. Response to DEIR Comments

Appendix B. RIM Study

- B.1 FAA RSA Determination Form
- B.2 Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study

Appendix C. Agency Correspondence

Appendix D. FONSI

Appendix E. Technical Memoranda

- Appendix E.1 - Air Quality and Noise Supporting Documentation
- Appendix E.2 - Draft Coastal Zone Management Consistency Statement
- Appendix E.3 - RMAT Output Report
- Appendix E.4 - Environmental Justice Supporting Documentation
- Appendix E.5 - Updated Environmental Justice Outreach Plan

Appendix F. List of Preparers

Appendix G. Distribution List

Appendix H. Literature Cited

This Page Intentionally Left Blank

Appendix A- Response to DEIR Comments

This Page Intentionally Left Blank

Response to DEIR Comments

The Massachusetts Environmental Policy Act (MEPA) requires Environmental Impact Reports (EIRs) to include a section of responses to comments received on the previous review document. In accordance with 301 Code of Massachusetts Regulations (CMR) 11.07(6)(l), this appendix includes Massport's responses to comments received on the Draft Environmental Impact Report (DEIR) for the Runway 27 End Runway Safety Area (RSA) Improvements Project filed with the MEPA Office on June 30, 2022. Delineated letters are included in this Appendix followed by responses to each comment. **Table A-1** lists the agencies and/or individuals that provided written comments on the DEIR. An electronic copy of the DEIR is available on Massport's website at https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/.

Table A-1 DEIR Commenters

Comment Letter #	Commenter
C	Commonwealth of Massachusetts, Secretary of the Executive Office of Energy and Environmental Affairs (Certificate)
1	Commonwealth of Massachusetts, Department of Environmental Protection (MassDEP), Boston Waterways Regulation Program
2	Commonwealth of Massachusetts, Department of Environmental Protection, Northeast Regional Office (MassDEP-NERO)
3	Commonwealth of Massachusetts, Division of Marine Fisheries (DMF)
4	Commonwealth of Massachusetts, Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP)
5	Massport Community Advisory Committee (MCAC)
6	Winthrop Town Council
7	Winthrop Air Hazards Committee (John Vitagliano)
8	Winthrop Board of Health (Bill Schmidt)
9	Airport Impact Relief, Incorporated (AIR, Inc.)
10	Margaret Roberts (Winthrop Citizen)

DEIR Certificate Requirements

The Secretary's Certificate on the DEIR required specific information to be included in the Final Environmental Impact Report (Final EIR). **Table A-2** lists the general requirements of the Certificate and where in the Draft Environmental Assessment (EA)/Final EIR that information can be found.

Table A-2 Draft Environmental Impact Report Certificate Requirements

Requirement	Final EIR Section
Update census tracts in Winthrop for the environmental justice (EJ) analysis	Section 3.12.2.2
Update major air and waste facilities within the Designated Geographic Area based on recent mapping	Table 3-11, Table E.4-5
Supplement analysis of air emissions for the impacts of emissions on EJ communities during construction	Section 3.3.2.1
Identify the locations where construction activities are above the City of Boston's residential criterion	Section 3.11, Table 3-8
Address comments from MassDEP on compliance with Stormwater Management Standards and mitigation for direct wetland impacts as well as how mitigation will protect public health	Section 3.14.3 Section 3.12.3
Address comments from MassDEP regarding impacts from new impervious surface and treatment on runoff	Section 3.14
Address comments from MassDEP and DMF on the impacts and mitigation for shading, coordination for mitigation measures for permanent shellfish impacts, and plans for allowing badged shellfishers to access the site	Appendix C
Coordinate with the Waterways Program to confirm location of the current state harbor lines	Figure 3-1, Figure 3-2, Figure 3-3
Clarify the Proposed Project's contribution to ongoing shellfish restoration	Section 2.1.3.2, Table 2-5, Table 2-7, Appendix C
Quantify all permanent and temporary impacts to grassland habitat and quantify specific locations for pavement removal and restoration	Section 3.4.4.1
Identify projected climate conditions including sea level rise and precipitation rates and how stormwater systems and Massport will engage in adaptive management strategies to address future climate conditions	Table 3-6
Estimate the number of marine vessels anticipated during construction and provide an overall quantitative estimate of GHG emissions from these sources	Section 3.3.2.1, Table 3-2, Table 3-3, Table 3-5
Require contractors to use construction equipment with Tier 4 federal emissions standards, retrofitted emission, control device, or alternative fuels to reduce emissions of pollutants	Section 3.3.3
Comply with Section 11.07 of MEPA regulations for outline and content, provide information and analysis within scope, and demonstrate avoidance, minimization, and mitigation for impacts	Chapter 4
Describe the project, identify changes since the Environmental Notification Form (ENF) and DEIR, describe permitting at all levels and status of actions, describe statutory and regulatory standards and the Project's consistency, include site plans for existing and post development	Section 1.3.2, Table 1-1, Section 1.3, Figure 1-3, Figure 2-11
Describe EJ outreach plan for the remainder of MEPA review and any outreach for National Environmental Policy Act of 1969 (NEPA) review, and address how stormwater management system would protect water quality for EJ populations	Appendix E.5
Supplement EJ analysis for potential adverse effects due to the redirection of flights during	Section 3.12, Table 3-11,

Table A-2 Draft Environmental Impact Report Certificate Requirements

Requirement	Final EIR Section
construction	Section 3.12.2.2, Section 4.3.7
Estimate number of marine vessel trips during construction and describe the proximity of marine traffic to EJ populations and efforts to minimize and mitigate any found impacts	Section 3.3.2.1, Table 3-2, Table 3-3
Address comments from MassDEP regarding treatment of stormwater and its impacts on turbidity, compliance with stormwater standards, and the ability of stormwater management systems to accommodate additional stormwater due to increased precipitation	Section 3.14.3
Demonstrate the Project will meet performance standards for Wetlands Protection Act (WPA) for each resource area and provide mitigation for permanent impacts	Section 3.14, Figure 3-3, Table 3-4
Record coordination between DMF and other resource agencies for the development of a detailed mitigation plan, including stating the continued access to the badged shellfishers	Section 4.2.1, Appendix C
Commitment to time-of-year restrictions for construction to minimize impact	Section 4.2.1
Include additional information on Chapter 91 and state harbor lines and add to all project plans	Figure 3-1, Figure 3-2, Figure 3-3
Address the relocation of shellfish as an alternative	Section 3.4.3, Section 4.2.1.3
Update public benefits determination narrative to demonstrate consistency with regulations	Section 3.6.5
Identify all permanent and temporary impacts to grassland habitat along with any proposed removal of existing excess pavement to create grassland restoration area	Section 3.4.4
Specify whether construction related noise will occur during tern nesting	DEIR Appendix D.5
Continue to consult with NHESP as the Project design progresses	Appendix C
Discuss how the project will be impacted by sea level rise for the 2050 and 2070 planning horizons using the Massachusetts Climate Resilience Design Standards Tool	Appendix E.3, Section 3.5.3.2, Table 3-6
Compare resilience of project components against recommendations from the MA Climate Resilience Design Standards Tool and discuss if the elevation of the runway is consistent with 2050 and 2070 planning horizons outlined by the tool	Table 3-6, Section 3.5.3.2
Discuss Massport's adaptive management strategies if it is not able to meet recommendations of the Climate Resilience Design Standards Tool	Section 3.5.3.2
Qualify marine vessel traffic and provide qualitative assessment of GHG emissions during construction and their impacts and associated mitigation on EJ communities	Section 3.3.2.1, Table 3-3, Table 3-2
Provide an overall update on construction period impacts and mitigation measures for noise, air quality, water quality, and transportation based on project development	Section 3.3, Table 3-2
Include a separate chapter summarizing proposed mitigation measures including construction mitigation as well as include Draft Section 61 Findings for each Agency Action	Section 4.4, Table 4-1
Include a copy of the DEIR certificate, comment letters, and comment responses including page numbers	Appendix A
Circulate the Draft EA/Final EIR to each person/agency who previously commented on the DEIR, each agency the Project will seek actions from	Appendix G
Send a notification of availability noting comment deadlines, instruction to access the document or request a hard copy	Appendix G

This Page Intentionally Left Blank

C

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Bethany A. Card
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/eea

August 29, 2022

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Boston Logan International Airport Runway 27 End Runway Safety Area (RSA) Improvement Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 16433
PROJECT PROPONENT	: Massport
DATE NOTICED IN MONITOR	: July 8, 2022

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Draft Environmental Impact Report (DEIR) and hereby determine that it **adequately and properly** complies with MEPA and its implementing regulations. The Proponent may prepare and submit for review a Final Environmental Impact Report (FEIR).

Project Description

As described in the Draft Environmental Impact Report (DEIR), the Massachusetts Port Authority (Massport) is proposing improvements to the Runway Safety Area (RSA)[1] located at the end of Runway 27 at Boston Logan International Airport. The Federal Aviation Authority requires that airports receiving federal funding for airport improvement projects and commercial service airports provide standard RSAs where possible.[2] The RSA is intended to reduce the risk

[1] As described by the Federal Aviation Authority (FAA), an RSA is a defined surface surrounding the runway, typically 500-feet wide and extending 1,000-feet beyond each runway end.
[2] Because many runways were built before the 1000-foot RSA standard was adopted approximately 20 years ago, the FAA implemented the Runway Safety Area Program to make practicable improvements to existing RSAs for priority runways.

of damage to aircraft and protection of passengers in the event of an unintentional excursion from the runway.[3]

The project proposes the construction of an approximately 650-foot long by 306-foot-wide RSA on a pile-supported deck (or pier) with an Engineered Materials Arresting System (EMAS) bed installed on the deck. An EMAS is constructed of collapsible concrete blocks which can decelerate an aircraft in a way that minimizes damage to the aircraft and potential injuries. An EMAS is often used when a full-dimension RSA (1,000 ft long by 500 ft wide) is not possible due to lack of available land or to minimize environmental impacts; an EMAS provides an FAA-approved level of safety equivalent to an RSA built to the full-length dimensions. It is expected that the 306-foot-wide deck would extend between 450 feet over Boston Harbor.

As indicated in the DEIR, the proposed RSA improvement is a safety improvement and does not extend the runway or have any effect on runway operations, runway capacity, or the types of aircraft that can use the runway.

Project Site

The project is located within Logan International Airport (Logan Airport), which is owned and operated by Massport. Logan Airport is New England's primary international and domestic airport and includes approximately 2,400 acres in East Boston and Winthrop, including 700 acres in Boston Harbor. Logan Airport is one of the most land-constrained hub airports in the nation and is surrounded on three sides by Boston Harbor. The airfield has six runways (which vary in length from 2,557 feet to 10,081 feet), 15 miles of taxiways, and approximately 240 acres of concrete and asphalt apron.

The 10-acre project area is focused on the east end of Runway 9-27 which is comprised of Runway 9 on the west end and Runway 27 on the east end. The project site includes the existing Runway 27 end and the armored coastal shoreline and intertidal and subtidal areas seaward of the existing runway end. Runway 9-27 is 7,001 feet long, 150 feet wide, and is constructed of asphalt pavement. The runway has 75-foot-wide paved shoulders on either side. At the approach end of Runway 9 (western end of the runway), the existing RSA meets the full dimensions set forth in the FAA design standards. The approach end of Runway 27 (eastern end of the runway) does not meet the current FAA design standards for length. This runway was constructed before the current FAA design guidelines were in place. The Runway 27 End RSA is only 150 feet long and therefore does not meet the RSA length requirement of 1,000 feet for a full dimension RSA.

Portions of the Project site include priority habitat as mapped by the Natural Heritage and Endangered Species Program (NHESP) *Massachusetts Natural Heritage Atlas* (15th Edition). The project is located adjacent to and within Boston Harbor and contains coastal wetland resource areas including Coastal Bank, Coastal Beach, Land Subject to Coastal Storm Flowage (LSCSF), Land Subject to Tidal Action, Land Containing Shellfish (LCS), and Land Under

[3] An excursion from the runway can include an overrun (when an arriving aircraft fails to stop before the end of the runway), an undershoot (when an aircraft arriving on a runway touches down before the start of the paved runway surface), or an event in which an aircraft veers off to one side of a runway.

Ocean (LUO). The project site includes areas within mapped Federal Emergency Management Agency (FEMA) flood zone VE (an area that is subject to high velocity waters and waves and is inundated by a 100-year storm) with a base flood elevation (BFE) of elevation (el.) 13 ft NAVD88. The landward area of the project site is mapped as FEMA flood zone AE (an area inundated by a 100-year storm but not subject to high velocity waters), with BFE el. 12 ft NAVD88 according to FEMA flood insurance rate map (FIRM) number 25025C0082J effective March 16, 2016.

The project site is located within two Environmental Justice (EJ) populations characterized as Minority and is within 1 mile of two EJ Populations also characterized as Minority.[4] The DEIR identified the "Designated Geographic Area" (DGA) for the project as 1 mile around EJ populations, included a review of potential impacts and benefits to the EJ populations within this DGA, and described public involvement efforts undertaken to date.

Changes Since the Filing of the DEIR

The DEIR states that there have not been significant changes since the ENF filing; however, the alternatives analysis was supplemented to evaluate foundation structure alternatives for the proposed RSA deck. In addition, a detailed assessment of environmental impacts associated with a more advanced project design has been conducted, and updated impact totals were presented in the DEIR.

Environmental Impacts and Mitigation

Environmental impacts associated with the project include the disturbance of 2.4 acres of land; creation of 3.8 acres of new impervious surface (3.3 acres RSA deck, and 0.5 acres approach slab and perimeter road); permanent alteration of 390 linear feet (lf) of Coastal Bank, 2,660 sf of Coastal Beach, 97,200 sf of LSCSF, 45,420 of Land Subject to Tidal Action, 66,760 sf Land Containing Shellfish, and107,700 sf of LUO. The project will impact 154,350 of flowed tidelands.

The project will minimize and mitigate environmental impacts by constructing an RSA with EMAS which will shorten the necessary length of the deck and reduce impacts to coastal wetland resources; supporting the RSA deck on 20-inch square concrete piles (326) which will shorten construction duration and related noise impacts and will have the smallest impact to wetland resource areas; adhering to time-of-year (TOY) restrictions, as applicable; and employing erosion and sediment control and other construction best management practices to reduce noise, air and water quality impacts during the construction period.

Jurisdiction and Permitting

The project is subject to the preparation of a Mandatory EIR pursuant to 301 CMR 11.03(3)(a)(5) because it requires Agency Action and involves a new non-water dependent use or Expansion of an existing non-water dependent structure, provided the use or structure occupies one or more acres of waterways or tidelands. The project also exceeds the ENF threshold at

[4] This information has been updated since the filing of the ENF which identified the project a being located within 1 EJ population characterized as minority and within 1 EJ population characterized as Minority and Income.

11.03(3)(b)(1)(f) because it will result in the alteration of one or more acres of any other wetland (LUO, Coastal beach, Land Containing Shellfish, LSCSF). The project requires a Chapter 91 (c. 91) License (Modification) and 401 Water Quality Certification (WQC) from MassDEP. The project will require Federal Consistency review by the Massachusetts Office of Coastal Zone Management (CZM). It may require a Conservation and Management Permit (CMP) from NHESP.

The project requires an Order of Conditions (OOC) from the Boston Conservation Commission (or in the case of an appeal, a Superseding OOC from MassDEP). The project will require a National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit from the Environmental Protection Agency (EPA). The Project will also be subject to review by the FAA under the National Environmental Policy Act (NEPA).

Because Massport, an Agency within the meaning of MEPA, is the Proponent, MEPA jurisdiction is broad and extends to those aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Review of the DEIR

The DEIR included a project description, existing and proposed conditions plans, estimates of project-related impacts, and a summary of stormwater management measures. As requested in the Certificate on the ENF, the DEIR provided a more detailed description of existing and proposed conditions and a comprehensive review of the project's impacts and measures to avoid, minimize and mitigate environmental impacts. The DEIR provided a response to comments on the ENF and draft Section 61 Findings. It also contained an assessment of the public health impacts of the project and information related to impacts on EJ populations consistent with 301 CMR 11.07(6)(n).

A two-week extension of the comment period was granted at the request of the Proponent to allow for additional public review of the DEIR. The extended comment period closed on August 22, 2022.

Alternatives Analysis

The DEIR contained a summary of the six alternatives identified as part of the *Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study (*the RIM/Runway 9- 27 RSA Alternatives Study. The alternatives, as previously described in the ENF, included:

- No Build Alternative
- Alternative 1 Declared Distances
- Alternative 2 Displaced Threshold Markings
- Alternative 3A Full RSA in Boston Harbor, Fill Option
- Alternative 3B Full RSA in Boston Harbor, Deck Option
- Alternative 4A EMAS on 500-Foot-Wide Deck
- Alternative 4B EMAS on 306-Foot-Wide Deck (Preferred Alternative)

As stated in the DEIR, Massport, in consultation with FAA, previously selected RSA Alternative 4B (EMAS on 306-foot-wide deck) as the Preferred Alternative. This alternative was selected because it would provide full FAA-required overrun and undershoot protection, while maintaining the airfield utility and efficiency. It would do so with reduced impacts to environmental resources in Boston Harbor and the navigation channel, compared to the other alternatives that would achieve the project goals.

As requested in the Certificate on the ENF, the DEIR included an alternatives analysis for the deck support component of the Preferred Alternative. As described in the DEIR, the deck support alternatives must be structurally sound to support the deck and the EMAS, the critical design aircraft (CDA),[5] and emergency vehicles. The supports much have a 75-year design life, be capable of withstanding current and future storm events, and to the greatest extent possible be designed to withstand anticipated sea level rise.[6] The DEIR states the two potential types of support structures for the deck are piles and caissons/drilled shafts. As described in the DEIR, piles are long, circular or square elements of between 12 to 36 inches in diameter or per side. They would be made from precast concrete, would be transported to the construction site, and would be driven into the ground using vibration or impact (pile driving). Caissons, which are circular columns typically much larger than piles (3 to 12 feet in diameter), would be constructed on the project site. A hole would be drilled into the bedrock into which structural steel would be placed and concrete would be pumped into the hole, creating a column. The number of spacing of the support structures is determined by the structural load they must support and the strength of the subsurface soil formation. The piles or caissons would be fastened together at the top by pile-caps and the connected rows are referred to as "bents." Piling or caisson configurations were developed at the conceptual design level and in developing the deck support alternatives, consideration was given to constructability issues, such as minimizing airfield disruptions, and to environmental resources and construction impacts. Four deck support alternatives were developed as shown in the table below.

Deck Support Alternative	Deck Support Type	Pile Size (inches)	Number of Vertical Elements[1]	Number of Batter Piles[2]	Total Number of Piles	Number of Bents[3]	Approximate Bent Spacing (feet)
1	Concrete Pile	20" x 20"	384	32	416	25	12.6'
2	Concrete Pile	20" x 20"	294	32	326	10	50'
3	Caisson	60" diameter	160	0	160	10	50'
4	Caisson	60" diameter	128	0	128	8	65'

1 The vertical elements are the piles or caissons.
2 Batter piles are bracing piles driven at an angle to the vertical to provide resistance to horizontal forces.
3 A bent is an array of piles or drilled shafts in a row and fastened together at the top by a pile-cap or bracing.

The four alternatives were screened based on permanent wetland resource area impacts and short-term construction impacts to airfield operations. Impacts to wetland resource areas included the total footprint on the seabed and intertidal area that would be directly impacted by

[5] The CDA is defined as the aircraft (using the associated runway) that imposes the greatest demand upon the stopping capability of the EMAS. The CDA is usually, though not always, the heaviest/largest aircraft that regularly uses the runway.
[6] The RSA must match the grade of existing Runway 9-27 and be relatively flat and free from bumps. During the 2020 rehabilitation of Runway 9-27, the Runway 27 End was raised approximately 10 inches to bring the runway into compliance with the FAA's design standards and to accommodate sea level rise.

the piles or caissons, and the potential scour of the seabed or intertidal area caused by the altered waterflow in the immediate area of the deck. As reported in the DEIR, Runway 9-27 is used for 42% of departures and 22% of arrivals. Operations on this runway would cease during construction. Massport has determined that the maximum practical runway closure time is 60 consecutive days in each of two construction seasons, or a total of 120 days. Each alternative was evaluated to determine if it could be constructed in 120 days or less. Also considered was the flexibility of the in-water construction barges to mobilize/de-mobilize in case of severe weather and the impact of construction noise associated with an impact or vibratory driver used to install piles and the auger drill used to install shafts. As stated in the DEIR, Deck Support Alternative 2 was advanced for further analysis because it could be constructed in 120 days, and because it would have the smallest impact to wetland resource areas. It would also have the shortest period of construction noise impacts to the surrounding neighborhoods. Although pile driving is somewhat louder than drilling for caissons, the duration of the pile driving for Alternative 2 is 27 days versus 168 days for the shorter of the two caisson alternatives. This alternative has fewer piles than the other pile alternative because it has a thicker deck, allowing greater spacing of the piles.

Environmental Justice

As noted above, the project site is located within two EJ populations characterized as Minority (Census Block Groups 9901.01[7] and 9813 Block Group 2) and is within 1 mile of two additional EJ populations also characterized as Minority (Census Block Groups 1804 Block Group 2 and 9801.01 Block Group 1). Within the Census Tracts containing the above four EJ populations within 1 mile of the project site, the following languages are identified as those spoken by 5% of more of residents who also identify as not speaking English very well: Spanish and Spanish Creole.

After filing the DEIR, Massport held a virtual public meeting on July 20, 2022, attended by MEPA staff which provided streaming Spanish translation. The meeting was held as a webinar and the public was able to type in questions to the Proponent and have them answered. Some members of the public found this format limiting and a second public meeting on August 10, 2022, at the request of the Executive Committee of the Massport Community Advisory Committee (MCAC).[8] In addition, a summary of the DEIR translated into Spanish was posted on Massport's website in advance of the DEIR filing. The DEIR also included an outreach plan summary for the project as it moves forward. This includes public notice (English and Spanish) in the Boston Herald, El Mundo, and the Winthrop Times, 6 months and 3 months prior to construction. In addition, the Proponent will hold a virtual public meeting with streaming Spanish translation 3 months prior to construction. Two weeks prior to construction, the Proponent will again publish public notice (English and Spanish) in the publications listed above. The FEIR should describe additional outreach as outlined in the Scope below.

The DEIR contained a baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in

[7] Census Tract 9901.01 is not associated with any data as it is located with Boston Harbor.
[8] MCAC is a legislatively created body made up of representatives from the 35 communities impacted by Massport's operations. The MCAC oversees and provides recommendations to Massport to minimize operational impacts on the 35 communities.

accordance with 301 CMR 11.07(6)(n)1. and the MEPA Interim Protocol for Analysis of EJ Impacts. According to the DEIR, the data surveyed do not appear to indicate an existing "unfair or inequitable" burden impacting the identified EJ populations in Winthrop; however, the data show some indication of burden in Boston. Specifically, the DEIR notes that the DPH EJ Tool identifies communities in which the identified EJ populations are located as exhibiting "vulnerable health EJ criteria"; this term is defined in the DPH EJ Tool to include any one of four environmentally related health indicators that are measured to be 110% above statewide rates based on a five-year rolling average.[9] The City of Boston is identified as having rates of Childhood Asthma and Low Birth Weight that are measured to be 110% above statewide rates. The census Tracts in Boston within the 1-mile DGA are not identified as exhibiting vulnerable health EJ criteria for any parameter for which data are available at the census tract level (Low Birth Weight and Childhood Blood Lead). While not specified in the DEIR, I note that Census Tract in Winthrop (Tract 1804), in which one of the identified EJ populations are located, also exceeds the 110% of statewide rate for Childhood Blood Lead.[10] C.1

In addition, the DEIR indicates that the following sources of potential pollution exist within the identified EJ populations, based on the mapping layers available in the DPH EJ Tool: C.2

- Major air and waste facilities: 1 (Massport LOGBM-0147)[11]
- Underground storage tanks: 1

As noted, the project will increase impervious area, impact coastal wetland resource areas, including filled and flowed tidelands, and extend into Boston Harbor. The project will also have construction period impacts, including traffic, noise, and potential changes to flight routes that could increase impacts on certain neighborhoods that may not experience such impacts during normal operating conditions. According to the DEIR, any shifting of flights during the construction period would utilize existing flight paths and use of those approach and departure routes is subject to wind, weather, and FAA safety requirements. The DEIR notes that depending on wind and weather and which runway configuration the FAA is utilizing, additional overflights would temporarily occur on Runways 4RL-22L, 4L-22R, Runway 33L, and Runway 32. As directed in the Scope below, the FEIR should supplement analysis of air emissions related to the construction period to assess the level of impacts on the identified EJ populations that would result from redirected flights during the construction. The FEIR should describe the flight path for each alternative runway that will be in use during construction and the extent to which it directs additional flights over EJ populations within 1 mile of the airport, as well as the extent to which the EJ populations would be adversely affected more than non-EJ populations. The Proponent should clearly explain the methodology for any conclusion of no adverse impact was drawn. C.3

[9] See https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. Four vulnerable health EJ criteria are tracked in the DPH EJ Viewer, of which two (heart attack hospitalization and childhood asthma) are tracked on a municipal level, and two (childhood blood lead, and low birth weight) are tracked on a census tract level.

[10] A review of the supporting documentation included in the DEIR indicates the Tool may have looked at Census Tract 1803 rather than 1804.

[11] This facility is Logan's airside fueling station with an underground storage tank. The location of this facility has been updated on recent mapping and is no longer in the project DGA. C.2 cont.

According to the DEIR, other construction activity is expected to generate short-term air and GHG emissions, including exhaust emissions from on-road construction vehicles, off-road construction equipment and marine transport vessels; evaporative emissions from asphalt placement and curing; and fugitive dust from disturbance of unpaved areas. Construction would be undertaken from the water with most materials and workers delivered to the site by barge. The DEIR states short-term construction impacts are expected to be limited to on-airport roadways (Transportation Way, Service Road, and Harborside Drive) with minimal impacts to local roadways. All trucks would access the site by Route lA, Interstate 90, and the main Airport roadways only. Trucks would be prohibited from using local streets unless they are seeking construction-related access to or from local businesses. The DEIR states Massport is committed to limiting idling and using Tier 3 or 4 equipment and EPA-compliant fuels to minimize temporary construction emissions. As stated throughout the DEIR, there will be no permanent impacts due to noise-sensitive land uses resulting from the project because safety improvements would not change the daily aircraft operations, type of aircraft, or location in which aircraft operate. The DEIR states temporary noise impacts associated with construction activities would be below the City of Boston's residential criterion of 86 dBA for all construction phases and that maximum construction sound levels would be experienced at locations that are not within an EJ population. The FEIR should state what locations would experience the maximum construction sound levels since the entire site is within an EJ population. The DEIR notes that the nearest residences are 2,400 feet from the outer edge of the RSA deck. The DEIR states that at 2,400 feet from the project the sound levels from an impact or vibratory driver used to install piles would be approximately 68 dBA. C.4

As to wetland impacts, the DEIR indicates that limited shellfishing would continue as permitted under the provisions of the Airport Security Zone Statute and other mitigation measures would be implemented to protect water quality as discussed in the wetlands section below. Comments from MassDEP indicate the project should comply with the Stormwater Management Standards and that mitigation should be proposed for direct wetland impacts. The DEIR should include updated information on how potential impacts to wetland resource areas and water quality will be mitigated to protect public health within the project DGA in accordance with the Scope below. C.5

The DEIR states there would be no disproportionate adverse impacts on EJ populations due to climate change. Specifically, the deck and sub-structure would be designed to withstand anticipated coastal storm events and sea level rise while not anticipated to increase climate risk to other properties in the area, including any properties within EJ areas surrounding the project site. Further discussion of climate resiliency is included below.

Impervious Area and Stormwater

As stated in the DEIR, impervious area will be increased by 3.3 acres of RSA deck over open water and by 0.5 acres of perimeter road pavement and approach slab some of which is in currently grassed uplands. Stormwater runoff from portions of the deck located within the intertidal zone (landward of MLW) would be collected in a separate piped drainage system and discharged at a location seaward of MLW. Runoff from portions of the deck located seaward of MLW would be discharged through scuppers distributed along each side of the deck. The DEIR states stormwater runoff from the deck will not erode sediments adjacent to the deck because discharge would be distributed and would only occur at locations that are inundated throughout

the tidal cycle. Stormwater runoff from the pavement associated with the relocation of the perimeter road would follow existing drainage patters and sheet flow down the riprap slope and into Boston Harbor. The DEIR states that the RSA and perimeter road generate negligible amounts of contaminants or suspended solids and will not be a source of pollutants and nutrients to receiving waters. In addition, these areas are not sanded, and no fertilizers are used on grassed areas. Pavement is also frequently swept. If needed, snow will be removed with a specialized snow blower with low ground pressure, although this is rarely required due to wind. Comments from MassDEP state the proposed deck creates new impervious surfaces, so at a minimum, treatment of the runoff from the deck is needed; this issue should be analyzed in accordance with the Scope below. C.6

Wetlands and Fisheries

As noted above, the following wetland resource areas will be impacted by the deck: 45,420sf of Land Subject to Tidal Action, 2,660 square feet of Coastal Beach, 97,200sf of LSCSF (100-year Floodplain), 107,700 sf of LUO, and 66,760sf of LCS. The impacts are summarized in the table below:

Table 5-1 Runway 27 End RSA Direct Impacts to Coastal Wetland Resources - Proposed Project

Wetland Resource Area	Jurisdiction	Impacts			
		RSA Deck (shading)	Piles (Number/Area[1])	Emergency Access Ramps	Total[2]
Land Under the Ocean	Local and State	107,700 sf	246 / 690 sf	0	107,700 sf
Coastal Beach	Local and State	2,170 sf	6 / 20 sf	490 sf	2,660 sf
Coastal Banks	Local and State	310 lf	N/A	80 lf	390 lf
Salt Marsh	Local and State	0	0	0	0
Land Containing Shellfish	Local and State	58,130 sf	124 / 350 sf	8,630 sf	66,760 sf
Land Subject to Tidal Action	Local and State	35,960 sf	70 / 200 sf	9,460 sf	45,420[3]
Land Subject to Coastal Storm Flowage	Local and State	92,000 sf	10 / 30 sf	5,200 sf	97,200 sf
Land Below Annual High Tide	Federal	143,660 sf	316 / 880 sf	9,460 sf	153,120 sf
Mud Flat (Special Aquatic Site)	Federal	37,210 sf	100 / 280 sf	490 sf	37,700 sf

All square footages are approximate values as they have been rounded to the nearest value of ten (most values were rounded up).
1 Each 20-inch square pile is 2.78 square feet (sf). Direct impact of all 326 piles is 906 square feet.
2 Area of impact under the RSA Deck or area of upland. Area of piles or approach slab not included, since included in the overall deck area.
3 Includes 1,230 square feet for RSA Deck approach slab.
lf = linear feet
sf = square feet
N/A = Not Applicable

The DEIR provided a summary of how the deck will affect each wetland resource area. The DEIR states that the permanent impacts to wetland resource areas consist of impacts from the 246 (326 total) pilings that will be installed within LUO. This represents 690 sf or approximately 1% of the natural substrate under the deck (107,700 sf or 2.47 acres). The deck would shade this 2.47 acre area. The DEIR states the habitat lost for shellfish and benthic invertebrates would be replaced by the new solid surface habitat of the piles which would attract encrusting organisms known as "fouling communities," providing new feeding opportunities for fish and other invertebrates. The DEIR describes an additional 510 sf of Coastal Beach that would be directly impacted by the RSA deck piles and two emergency access ramps. The DEIR

describes the Coastal Beach in this area as offering little benefit for flood control, wildlife habitat and states the new pilings would help to dissipate wave energy contributing to storm damage prevention.

As noted above, the DEIR acknowledges that the project may affect the productivity of shellfish in the project area. A survey of the intertidal zone was conducted, showing the site supports commercially important species including soft-shell clams, razor clams, surf clams, and blue mussels; however, the survey identified extremely low densities of soft-shell clams due to disease and states that anticipated impacts to LCS would not be significant. The DEIR also states the shadowing of the deck would not impact shellfish species since clams are filter feeders and would be able to continue feeding with the deck in place. The proposed safety ramps would directly impact 8,630 sf of LCS including a 400 sf area supporting blue mussels. The DEIR states the hard surface of the ramps and adjacent riprap would provide new blue mussel habitat. In addition, a scour analysis was conducted to determine if the presence of piles would alter patterns of tidal currents and/ or would cause either erosion or accretion of the sediments. The results of the sediment transport and scour analysis were reported in the DEIR and determined there would be no change to erosion or accretion in the vicinity of the project from the proposed RSA deck and support piles. Therefore, secondary impacts to shellfish habitat from shifting sediments caused by the project would not be anticipated. The DEIR reports that mitigation for the lost shellfish habitat is being developed with the Department of Marine Fisheries (DMF).

Sonar and video surveys were also conducted and did not detect the presence of eelgrass in the vicinity of the project site. The video survey did confirm the presence of winter flounder and the DEIR proposes to adhere to a time-of-year restriction for in-water, silt producing work from February 15th-June 30th.

As described in the DEIR, work within LSCSF would consist of activities to reconstruct the RSA, match the new RSA deck, and improve access around the airport. The existing RSA would be raised to elevation 15.75 feet (NAVD88) to match the Runway 27 elevation. The perimeter road would be realigned to straighten the road as it approaches the runway to improve driver visibility and safety. The emergency egress ramps would be extended to connect to the perimeter road on either side of the RSA, impacting 5,200 sf of LSCSF. Work for the RSA and perimeter road would alter an additional 92,000 sf of LSCSF and would raise the RSA above the current 100-year flood level. Ten piles impacting approximately 30 square feet would also be within LSCSF.

Comments from MassDEP state the FEIR should address the impacts of shading, mitigation, and other performance standards as outlined in the Scope below. Comments from DMF request that the FEIR include a record of the coordination regarding mitigation for permanent impacts to shellfish and plans to allow continuation of the badged shellfishing access program at the site. C.7

Chapter 91 and Tidelands

As requested in the Certificate on the ENF, the DEIR clarified impacts to tidelands and included the table below:

Table 5-2 Runway 27 End RSA Direct Chapter 91 Impacts (Support Design Alternative 2)

Project Element	Impacts
RSA Deck	144,890 square feet
Piles[1]	880 square feet
Emergency Access Ramps	9,460 square feet
Total	154,350 square feet

1 Each 20-inch square pile is approximately 2.78 square feet.

The DEIR describes the impacts to Chapter 91 resources as the area of the deck, deck pile supports, and emergency egress ramps seaward of the MHW line. There would also be a small sliver of the deck landward of the MHW. The DEIR also notes the site is not fully accessible to the public as it is within Logan Airport's 500-foot Security Zone as established by MGL Chapter 90, Section 61. The proposed RSA deck would be approximately 175 feet away from the navigation channel at its closest point and would not be expected to adversely affect navigation. Comments from the MassDEP Waterways Program state that the DEIR references Chapter 170 of the Acts of 1880 as the origin of the state harbor line at the project site and asserts that any harbor lines that may have existed would no longer be in effect. Since the filing of the ENF, Massport has conferred with the Waterways Program and together identified Chapter 733 of the Acts of 1966 which modified the state harbor line and appears to be generally consistent with the modern build-out of the airfield. Comments from the Waterways Program indicated staff is available to assist Massport in confirm the location of the current state harbor line prior to the filing of the FEIR. Additional requests are detailed in the Scope below. C.8

Public Benefit Determination (PBD)

The project site is comprised of tidelands subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168) and the Public Benefit Determination regulations (301 CMR 13.00). In response to the Certificate on the ENF, the DEIR included detailed information describing the nature of tidelands affected by the non-water dependent project and documented compliance with the requirements for public benefits. Specifically, the DEIR outlined the purpose and effect of the project as increasing safety for aircraft and passengers in emergency situations as required by the FAA. The DEIR also reinforced that there would be no changes to airport operations once construction of the RSA deck is complete. Massport will minimize short-term noise and air emissions by having much of the construction material and workers access the project site by barges and boats with only concrete and other EMAS materials delivered by trucks using only Route 1A, Interstate 90 and airport roadways. The DEIR states there would be no permanent noise or air quality impacts from the project because the RSA would not change the number or types of aircraft operations.

As noted, no access is allowed within the Logan Airport Security Zone (500 feet seaward and parallel to the MHW mark) with the exception of limited shellfish harvesting by licensed shellfish diggers who undergo a security assessment. The DEIR states limited shellfishing would continue to be permitted in accordance with the provisions of the Security Zone Statute in areas that have historically supported the activity. The DEIR also reviewed benefits including community activities, environmental protection and preservation, and public health, safety, and

the general welfare. The 500-foot security area seaward of MHW is broken up into an inner and out zone with only permitted shellfishing allowed within the first 250 feet. A series of orange and white buoys mark this inner security area. As stated in the DEIR, a portion of the RSA deck would extend beyond the inner 250-foot security area and into a portion of the outer 250-foot security area. The RSA deck would restrict transient boating within the footprint of the deck. Boats operating in the outer 250-foot security zone would need to divert around the RSA deck. Boats are not permitted to anchor within the 500-foot security zone and the RSA deck would not change the restriction on boating activities. The DEIR states the proposed project aims to avoid and minimize impacts to wetland resource areas and will likely contribute to ongoing shellfish restoration. These benefits will need to be clarified in the FEIR. Benefits to public health, safety, and general welfare provided by the RSA improvements are related to aviation safety and the reduced potential for injury to passengers, aircraft crew, and airport employees should an aircraft overrun, undershoot, or veer off the runway. C.9

I will issue a PBD within 30 days of the issuance of the FEIR Certificate.

Rare Species

As noted above and indicated is NHESP's comment letter, the proposed project site is mapped as *Priority Habitat* for a state-listed species: Upland Sandpiper (*Bartramia longicauda*), Endangered and Eastern Meadowlark (*Sternella magna*), Special Concern as indicated in the *Massachusetts Natural Heritage Atlas* (15th Edition).

The DEIR included the results of a May 2022 survey of the project site and nearby Snake Island (in Winthrop) to determine the presence of state and federal-listed species. Although the survey did not observe the species of interest on the Runway 27 site, open grassland habitat is present that could support upland sandpiper or meadowlark. The survey of Snake Island found least and common terns as well as suitable nesting habitat for terns. The DEIR details that there may be the potential to offset the loss of grassland habitat with removal and restoration of existing excess pavement. The FEIR should quantify all permanent and temporary impacts to grassland habitat and specify locations for pavement removal and restoration as detailed in comments from NHESP and outlined the Scope. C.10

Climate Change

Adaptation and Resiliency

As stated in the ENF and again in the DEIR, the site is identified as having a high risk rating due to exposure to sea level rise/storm surge, extreme precipitation due to urban flooding, and extreme heat. The DEIR restates that Massport raised the runway threshold 10 inches during a 2020 safety rehabilitation of Runway 9-27 to account for sea level rise. Massport's Floodproofing Design Guide requires new facilities to be at least at an elevation of 17.0 feet (NAVD88). The proposed RSA deck has been designed to elevation 15.75 feet (NAVD88) to match Runway 9-27; raising it higher is not possible given the elevation of the Runway 27 End. The elevation results in a deck which would be higher than the Runway 4R light pier and Runway 33L RSA deck. The DEIR also states that in the event the RSA deck is flooded, Runway 9-27 would be taken out of service until safe operating conditions can resume. The DEIR does not identify the projected climate conditions and assumptions, such as predicted rates C.11

of sea level rise and precipitation rates associated with future storms that may impact the proposed RSA deck; the FEIR should provide this information. The FEIR should also discuss whether Massport will engage in adaptive management strategies to further elevate its runway infrastructure in the future. In addition, comments for MassDEP indicate Massport will need to provide stormwater management for the increased impervious area. The FEIR should discuss how the stormwater system will be sized to address future climate conditions including increased precipitation as outlined in the Scope. C.11

Greenhouse Gas (GHG) Emissions

The DEIR included a discussion of operational GHG emissions which Massport began calculating in the mid-2000s. Total emissions in 2019 were estimated to be 808,125 metric tons of carbon dioxide equivalents (CO_{xe}), which represents approximately one percent of statewide totals. While this safety project will not change emissions at Logan Airport, the MEPA GHG Protocol requires discussion of project-related emissions. The DEIR estimates that construction would generate approximately 36 to 68 total truck trips per weekday (depending on project phase) and require 6 material barges. As stated above, to minimize emissions, the construction equipment will be maintained and operated using USEPA compliant fuels for on road and off-road equipment and vehicle applications to minimize emissions. The FEIR should estimate the number of marine vessel traffic anticipated during the construction period and should provide an overall quantitative estimate of GHG emissions anticipated during the construction period. As discussed above, the FEIR should analyze the extent to which flights may be diverted during the construction period so as to increase impacts including air/GHG emissions over EJ populations. C.12

Where feasible, the project will use Tier 3 or Tier 4 equipment off-road construction equipment. I encourage Massport to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD). The DEIR states that construction equipment will also be required to comply with the Massachusetts Anti-Idling Law. C.13

Construction Period

The DEIR contained a draft Construction Management Plan (CMP) that includes describes project activities, schedule, and sequencing. It includes best management practices to avoid and minimize adverse environmental impacts and address potential mitigation related to land disturbance. The CMP also includes a disposal plan for excess construction materials. To limit temporary impacts to wetland resource areas, a turbidity curtain will be deployed. The curtain will also prevent protected fish and sea turtles from entering the active construction area. The DEIR reviews temporary impacts related to the use of barges and pile driving operations. Sediments released from these operations are not expected to result in significant sediment concentrations. The DEIR also addresses spill prevention measures and procedures to demobilize to temporarily open Runway 9-27 in the event of an emergency or extreme weather affecting the other runways. As detailed above the DEIR also reviews transportation related impacts related to moving construction materials, equipment, and personnel. As noted in the DEIR, construction is expected to take place 7 days per week beginning at 7 a.m. weekdays, 8 a.m. on Saturdays, and 9

a.m. on Sundays and ending by 7 p.m. on all days. As noted above, work will take place in two, 60 day periods between July 1 and September 30, 2025, and 2026.

Conclusion

The DEIR described the project, including revisions to the project design since the ENF and the environmental impacts and mitigation associated with the project consistent with the Scope included in the ENF Certificate. The Proponent should submit a FEIR that provides updated project information and additional EJ, stormwater, wetland, climate resiliency and other analyses as specified in the Scope below.

SCOPE

General

The FEIR should follow Section 11.07 of the MEPA regulations for outline and content and provide the information and analyses required in this Scope. It should clearly demonstrate that the Proponent has sought to avoid, minimize and mitigate Damage to the Environment to the maximum extent practicable. C.14

Project Description and Permitting

The FEIR should describe the project and identify any changes since the filing of the ENF and DEIR. It should identify and describe State, federal and local permitting and review requirements associated with the project and provide an update on the status of each of these actions. The FEIR should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. The FEIR should include detailed site plans for existing and post-development conditions at a legible scale. The plans should include sections, and elevations to accurately depict existing and proposed conditions, including proposed above- and below-ground structures. C.15

Environmental Justice

The FEIR should describe the overall EJ outreach plan that the project intends to follow for the remainder of the MEPA review process, including any outreach it will conduct as part of the parallel federal NEPA process. The Proponent should address how any proposed stormwater management system would protect water quality in EJ populations. C.16

The FEIR should supplement its analysis of impacts on EJ populations, specifically, with respect to the potential for disproportionate adverse impacts that may result from redirected flights during the construction period. The FEIR should clarify whether any of the identified EJ populations are located within the flight paths to which planes are expected to be redirected during the construction period; with what frequency (based on existing data) the redirected flights are anticipated to extend over the EJ areas (thereby increasing air emissions impact); and how this increased impact compares to already existing deviations in flight patterns due to normal weather conditions. The FEIR should clarify whether the identified EJ populations would be affected from the redirected flights more than non-EJ populations and should clearly explain the methodology for any conclusion of no adverse impact, including the methodology for C.17

selecting a "comparable area" for purposes of comparing impacts to EJ populations in accordance with the MEPA Interim Protocol on Analysis of EJ Impacts. C.17

The DEIR indicates that construction of the project will be undertaken from the water with most materials and workers delivered to the site by barge. The FEIR should estimate the number of marine vessel trips are anticipated during the construction period and provide a qualitative description of whether marine traffic will extend near the identified EJ populations (and if so, describe the routes of travel) and what measures will be taken to minimize air impacts on residential neighborhoods similar to the mitigation measures to be taken for construction vehicles. C.18

Impervious Area and Stormwater

The project will increase impervious area by 3.8 acres of which 3.5 acres is the proposed deck. Comments from MassDEP state that at a minimum, treatment of the deck runoff is needed. MassDEP notes that previously, the Runway 33L and 22R RSA work was found to increase the proposed velocity of the runoff to the point that it would erode the substrate in the underlying a resource areas. The increase to turbidity to resource areas from uncontrolled release of stormwater generated by the proposed RSA is not addressed in the DEIR. Comments from MassDEP state that stormwater control measures need to be proposed to provide water quality treatment and reduce the velocity of the runoff to demonstrate compliance with 310 CMR 10.05(6)(k)1-10. The FEIR should address stormwater compliance and whether the proposed stormwater design would be sufficient to accommodate future storms in light of future climate conditions as detailed in the Climate Scope below. C.19

Wetlands and Fisheries

The DEIR asserts that the project will not require a Wetlands Protection Act (WPA) variance and that the deck construction over wetland resource areas will meet the performance standards for work in those resource areas. As described in MassDEP's comment letter, which is incorporated by reference herein, the Agency does not concur and points to the following: C.20

- No demonstration has been made that the Project as proposed will comply with Stormwater Management requirements specified at 310 CMR 10.05(6)(k)1, 2, and 3.
- 485 square feet of Coastal Beach would be altered and converted to hard bottom by the emergency egress ramps with no mitigation.

The FEIR should demonstrate the project as proposed will meet the performance standards of the WPA for each Resource Area, including appropriate mitigation to address permanent impacts.

Additional comments from DMF request that a record of project coordination between DMF and other resource agencies to develop a detailed mitigation plan for permanent impacts to shellfish and mud flat habitat be included in Appendix C: Agency Correspondence of the FEIR. DMF request that this record also contain documentation related to badged shellfishers continued access to the site following construction. As noted below, project mitigation should include the recommended time-of-year restriction for in-water, silt-producing work from February 15 to June 30 to minimize impact to winter flounder and the use of turbidity curtains to contain turbidity associated with inwater silt-producing work occurring outside of the recommend TOY C.21 C.22

to minimize impacts to spawning and early life history stages of shellfish species in the vicinity of the project. C.22

Chapter 91/Tidelands

Comments from the MassDEP Waterways Program request the FEIR include the following additional information related to Chapter 91 and the state harbor line to confirm the project is consistent with the pertinent statutes: C.23

- Confirmation there are no further modifications to the state harbor line in this location subsequent to the 1966 Act;
- The location of the state harbor line be added to all project plans and exhibits related to Chapter 91 in the Final EIR and the eventual Waterways License Application;
- Documentation suitable to demonstrate that the project complies with Chapter 733 of the Acts of 1966 and any subsequent statute to the extent applicable.

Comments from MassDEP also request that relocating shellfish be addressed as an alternative in accordance with 310 CMR 10.34 (6). C.24

Public Benefit Determination

The project site is comprised of tidelands subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168) and the Public Benefit Determination regulations (301 CMR 13.00). Consistent with Section 8 of the legislation, I must conduct a Public Benefit Review as part of the review of EIR projects located on tidelands that entail new use or modification of an existing use. I will issue a PBD within 30 days of the issuance of a Certificate on the FEIR. The FEIR should include an updated PBD narrative which demonstrates consistency with the regulations. C.25

Rare Species

As noted above and indicated is NHESP's comment letter, the proposed project site is mapped as *Priority Habitat* for a state-listed species: Upland Sandpiper (*Bartramia longicauda*), Endangered and Eastern Meadowlark (*Sternella magna*), Special Concern as indicated in the *Massachusetts Natural Heritage Atlas* (15th Edition). Snake Island, located to the east of the project supports Common Tern (Sterna hirundo) and Least Tern (Sternula antillarum), species state-listed as Special Concern. Comments from NHESP indicate it is not clear whether the enhancements to the RSA will or will not result in a Take (321 CMR 10.18(2)(b)) of state-listed species. NHESP requests the Proponent identify all permanent and temporary impacts to grassland habitat along with any proposed removal of existing excess pavement to create grassland restoration area. The Proponent should specify whether the anticipated timeline for the commencement of construction related noise will occur during the tern nesting season (May-July). C.26 C.27

Comments from NHESP state it may be possible to design the proposed project to avoid a Take, the Division notes that projects resulting in a Take of state-listed species may only be permitted if they met the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species

consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term benefit to the conservation of the state-listed species. The Proponent should continue to consult with NHESP as the project design progresses. C.28

Climate Change/Adaptation and Resiliency

The DEIR states the RSA deck has been designed to have a 75-year useful life. The FEIR should discuss how the project will be impacted by sea level rise in 2050 and 2070, the planning horizon identified by the MA Climate Resilience Design Standards Tool prepared by the Resilient Massachusetts Action Team (RMAT). The output report from the MA Resilience Design Tool provided in the DEIR recommends that the runway safety deck be designed to be resilient to the 100-year storm for sea level rise and the 25-year storm for extreme precipitation. These recommendations appear to be correlated to a "Medium" criticality assessment of project assets, which is understated given the critical function of Logan Airport as a key transportation hub for the Northeast region. For "High" critical assets, the MA Resilience Design Tool guidance recommends planning for the 200-year storm (as of 2070 and interim planning horizon of 2050) for most buildings/facilities for the sea level rise/storm surge parameter, and up to the 500-year storm for transportation assets. For utility assets like stormwater systems, the Tool recommends planning for the 50-year storm as of 2070 for the extreme precipitation parameter.[12] C.29

The FEIR should compare the resiliency of key project components, including elevation of the runway safety area and the stormwater system, against the recommendations from the Tool. Specifically, the FEIR should discuss whether the elevation of the runway safety area is consistent with recommendations from the MA Resilience Design Tool for the 2050 and 2070 planning horizon. To the extent project design is not anticipated to meet these recommendations, the FEIR should discuss whether Massport will engage in adaptive management strategies to improve resiliency of project assets in the future. C.30 C.31

Greenhouse Gas (GHG) Emissions

The FEIR should provide a qualitative assessment of marine vessel traffic as stated in the Environmental Justice section above and provide an overall quantitative estimate of GHG emissions anticipated during the construction period (including truck traffic). As noted, the FEIR should supplement the analysis of air emissions impacts on EJ populations as described above. The FEIR should revise mitigation commitments relative to GHG emissions based on this analysis. C.32

Construction Period

The FEIR should provide the supplemental analysis of air quality impacts during the construction period, as indicated above, The FEIR should provide an overall update on the C.33

[12] See https://eea-nescaum-dataservices-assets-prd.s3.amazonaws.com/cms/GUIDELINES/20210401Section3ClimateResilienceDesignStandardsOverview.pdf, at p. 19.

project's construction-period impacts and mitigation relative to noise, air quality, water quality, and transportation, based on further development and/or changes to the proposed project. It should confirm that the project will require its construction contractors to use Ultra Low Sulfur Diesel fuel, and discuss the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters. More information regarding construction-period diesel emission mitigation may be found on MassDEP's web site at http://www.mass.gov/dep/air/diesel/conretro.pdf. C.33

Mitigation and Draft Section 61 Findings

The FEIR should include a separate chapter summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a comprehensive list of all commitments made by the Proponent to avoid, minimize and mitigate the environmental and related public health impacts of the project, and should include a separate section outlining mitigation commitments relative to EJ populations. The filing should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in a tabular format organized by subject matter (wetlands, rare species, stormwater, environmental justice, etc.) and identify the Agency Action or Permit associated with each category of impact. Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project. The filing should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing to ensure that adequate measures are in place to mitigate impacts associated with each development phase. C.34

Responses to Comments

The FEIR should contain a copy of this Certificate and a copy of each comment letter received. It should include a comprehensive response to comments on the ENF that specifically address each issue raised in the comment letter; references to a chapter or sections of the FEIR alone are not adequate and should only be used, with reference to specific page numbers, to support a direct response. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what has been expressly identified in this certificate. C.35

Circulation

The Proponent should circulate the FEIR to each Person or Agency who previously commented on the DEIR, each Agency from which the Project will seek Permits, Land Transfers or Financial Assistance, and to any other Agency or Person identified in the Scope. Pursuant to 301 CMR 11.16(5), the Proponent may circulate copies electronically. However, the Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. C.36

The Proponent should send a letter accompanying the digital copy or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. If submitted in hard copy, the FEIR submitted to the MEPA office should include a digital copy of the complete document. C.37

August 29, 2022
Date

Bethany A. Card

Comments received:

07/26/2022	John Vitagliano
07/28/2022	Division of Marine Fisheries (DMF)
08/10/22	M. Roberts
08/19/2022	Massport Community Advisory Committee (MCAC)
08/22/2022	Massachusetts Department of Environmental Protection (MassDEP) Northeast Regional Office (NERO)
08/22/2022	B. Schmidt
08/22/2022	MassDEP Waterways Regulation Program (WRP)
08/22/2022	Natural Heritage and Endangered Species Program (NHESP)

BAC/JH/jh

This Page Intentionally Left Blank

MEPA Certificate

ID #	Comment	Response
C.1	While not specified in the DEIR, I note that Census Tract in Winthrop (Tract 1804), in which one of the identified EJ populations are located, also exceeds the 110% of statewide rate for Childhood Blood Lead. A review of the supporting documentation included in the DEIR indicates the Tool may have looked at Census Tract 1803 rather than 1804.	Census tract 1803 has been removed and 1804 has been added in Section 3.12.2.2 (pg. 3-43) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, and Appendix E.4, *Environmental Justice Supporting Documentation*. The 2016-2020 data identifies two case counts in census tract 1804 that result in an exceedance of 110% of the statewide rate for Elevated Blood Lead. The Massachusetts Department of Public Health EJ Tool (DPH EJ Tool) is regularly updated as new data becomes available and the DPH EJ Tool is further refined. The DEIR utilized Elevated Blood Lead data from 2015-2019, while the current version of the DPH EJ Tool, at the time of filing this Draft EA/Final EIR, has data from 2016-2020. Census tracts and their statistical significance, stability, case counts, rates, and statewide rates are updated accordingly in Section 3.12, *Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks* (pg. 3-41) of Draft EA/Final EIR Chapter 3, and in Table E.4-1 (pg. E.4-2) and Table E.4-2 (pg. E.4-3) of Appendix E.4.

ID #	Comment	Response
C.2	The location of this facility has been updated based on recent mapping and is no longer in the project DGA: Major air and waste facilities: 1 (Massport LOGBM-0147). This facility is Logan's airside fueling station with an underground storage tank.	As detailed in the footnote of the Secretary's Certificate, the facility labeled "LOGBM-0147" is Logan Airport's airside fueling station with an underground storage tank. The location of this facility has been updated in recent data (DPH EJ Tool 2022) and is no longer in the Proposed Project's Designated Geographic Area (DGA). Therefore, there are no major air and waste facilities within the project DGA. An updated version of DEIR Table 6-2, "Sources of Pollution within 1 Mile," is provided in Draft EA/Final EIR Table E.4-5 (pg. E.4-5) of Appendix E.4, *Environmental Justice Supporting Documentation*, to reflect this change. This change was also reflected in the assessment of existing unfair or inequitable burden found in Table 3-11 (pg. 3-47) of Chapter 3, *Affected Environment and Environmental Consequences*. It did not change the previous finding of no existing unfair or inequitable burden.
C.3	The FEIR should supplement analysis of air emissions related to the construction period to assess the level of impacts on the identified EJ populations that would result from redirected flights during the construction. The FEIR should describe the flight path for each alternative runway that will be in use during construction and the extent to which it directs additional flights over EJ populations within 1 mile of the airport, as well as the extent to which the EJ populations would be adversely affected more than non-EJ populations. The Proponent should clearly explain the methodology for any conclusion of no adverse impact was drawn.	During the temporary closure of Runway 9-27, aircraft operations are anticipated to temporarily shift from Runway 9-27 to other runways, temporarily increasing the number of operations along the existing flight paths of the other runways (overall operations would remain the same with the equivalent decrease in Runway 9-27 operations). The choice of which runway configurations FAA will use for approach and departure routes will continue to be driven by wind, weather, and FAA safety requirements. Since the temporary closure will not alter the number of operations or aircraft types flown, overall aircraft emissions from Logan Airport will remain the same as described in Section 3.3.2.1 (pg. 3-9) in Chapter 3, *Affected Environment and Environmental Consequences*. These changes are not anticipated to result in a significant adverse impact to nearby EJ communities. The Project Site boundaries are restricted to the Logan Airport campus, which, while within an EJ block group, does not contain any residential areas. See the response to C.17 for additional details. Also see Section 5.9.3 (pg. 5-41) of DEIR Chapter 5, *Impact Assessment*, and Section 6.5.3 (pg. 6-8) of DEIR Chapter 6, *Environmental Justice and Public Outreach.* Refer also to Draft EA/Final EIR Appendix E.4, *Environmental Justice Supporting Documentation*, and E.5, *Updated Environmental Justice Outreach Plan*.

ID #	Comment	Response
C.4	The DEIR states temporary noise impacts associated with construction activities would be below the City of Boston's residential criterion of 86 dBA for all construction phases and that maximum construction sound levels would be experienced at locations that are not within an EJ population. The FEIR should state what locations would experience the maximum construction sound level since the entire site is within an EJ population.	Table 3-8 (pg. 3-40) of Draft EA/Final EIR Chapter 3, *Affected Environmental and Environmental Consequences*, identifies the A-weighted sound level exceeded 10 percent of the time (L_{10}) during construction of the Project at the noise-sensitive receptors near the Project Site. Table 5-10 of DEIR Chapter 5, *Impact Assessment*, identifies the maximum A-weighted sound level (L_{max}) anticipated during construction of the Proposed Project. As shown in Table 5-10, the predicted L_{max} during construction is anticipated to be 69 dBA at Frances Street and Pico Avenue (Receptor 4) and Woodside Park, Baker Road, and Bartlett Parkway (Receptor 5) in both 2025 and 2026. The Project Site boundaries are restricted to the Logan Airport campus, which, while within an EJ block group, does not contain any residential areas. See Section 3.11, *Noise and Noise Compatible Land Use* (pg. 3-37), of Draft EA/Final EIR Chapter 3 for more information.

C.5	Comments from MassDEP indicate the project should comply with the Stormwater Management Standards and that mitigation should be proposed for direct wetland impacts. The DEIR should include updated information on how potential impacts to wetland resource areas and water quality will be mitigated to protect public health within the project DGA in accordance with the Scope.	As described in Section 3.14.3 (pg. 3-55) of this Draft EA/Final EIR Chapter 3, *Affected Environmental and Environmental Consequences,* the Proposed Project will comply with applicable Stormwater Management Standards. The Project was designed to avoid and minimize adverse impacts to the maximum extent practicable, but unavoidable permanent impacts to coastal wetlands remain. The proposed pile supported deck (approximately 450-feet long by 306-feet wide) has an overall footprint of approximately 3.2 acres. The wetland area is subject to federal jurisdiction as Waters of the U.S., as well as state-regulated resource areas including Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, and Land Under the Ocean. The direct alteration of these resources would be restricted to the footprint of the pilings and would be approximately 880 square feet of Land Subject to Tidal Action (LSTA), Land Under the Ocean, Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish. An additional 9,460 square feet of coastal resources would be altered by the emergency egress ramps. Most of this area has been previously altered. Approximately 1,200 square feet of mitigation area will be provided to replace the mud flat and Land Under Ocean lost from the pile installations and egress ramps. Details of the proposed mitigation will be provided as part of the Project WPA permitting effort. The mitigation would be expected to include some form of shoreline restoration in Boston Harbor or Chelsea Creek or could involve mud flat creation like Massport conducted to offset impacts associated with the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. The Project would not change wave direction or velocity, nor result in increased erosion or deposition in the marine environment. Minor scour effects near the piles are anticipated. A turbidity curtain would be deployed around the active construction work area to contain sediment resuspended during pile-driving activities. No impacts or risks to children's environmental health or safety are anticipated with the proposed Runway 27 End RSA Improvements Project as described in Section 3.12.3 (pg. 3-48). The Proposed Project would not result in potential impacts to water quality. It would not create or make more readily available products or substances that could potentially harm children via contact or ingestion through air, food, drinking water, recreational waters, or soil. Therefore, no disproportionate impacts to health and/or safety risks to children are anticipated.

ID #	Comment	Response
C.6	Comments from MassDEP state the proposed deck creates new impervious surfaces, so at a minimum, treatment of the runoff from the deck is needed; this issue should be analyzed in accordance with the Scope.	Stormwater management for the proposed RSA deck and the impervious surface created by the associated perimeter road improvements will be designed as part of the project's final design; it will be collected, treated, and discharged in compliance with the Massachusetts Stormwater Management Standards and approved during permitting. Runoff from the new impervious pavement associated with the relocated perimeter road and the runway approach and shoulders will be allowed to sheet flow onto adjacent grassed or crushed stone surfaces. Water will be allowed to infiltrate in these pervious areas or may runoff overland to Boston Harbor. A stormwater collection system of scuppers along the sides of the RSA deck will be sized to collect flows from the 10-year storm event as required under State standards. The scuppers will be connected to trunk lines to carry the runoff to the outer end of the proposed deck to be released into deep water (17 to 22 feet deep). Additional information is provided in Section 3.14, in Chapter 3, *Affected Environment and Environmental Consequences* (pg. 3-53).

ID #	Comment	Response
C.7	Comments from MassDEP state the FEIR should address the impacts of shading, mitigation, and other performance standards as outlined in the Scope below. Comments from DMF request that the FEIR include a record of the coordination regarding mitigation for permanent impacts to shellfish and plans to allow continuation of the badged shellfishing access program at the site.	The proposed RSA deck will overshadow approximately 2.7 acres of seabed and sandy or rocky beach area. The shaded area will continue to be subject to the ebb and flood of tidal waters and shellfish and other marine species will be able to continue to thrive under the deck. Flushing of tidal waters under the deck will continue to supply phyto- and zooplankton for filter feeding species and organic detritus for scavengers or detritivores. No rooted vascular plants (salt marsh or aquatic bed species) are present within the deck area that would be impacted by the lack of sunlight. The proposed RSA deck will be supported by about 260 concrete piles impacting about 700 square feet of seabed or beach area. While this is a small percentage of the available seabed in the vicinity of the Project Site, Massport has committed to restoring/replacing the lost area with comparable intertidal and sub tidal soft bottom habitat to offset the loss of seabed from the pile installations. Once constructed, badged shellfishers will be allowed to access to shellfish beds beneath the RSA deck to collect shellfish. However, they will not be allowed to bring their boats under the deck for security reasons (see Section 4.3.2 [pg. 4-3] of Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*). See Appendix C, *Agency Correspondence*, for a record of coordination.
C.8	Comments from the Waterways Program indicated staff is available to assist Massport to confirm the location of the current state harbor line prior to the filing of the FEIR.	Massport coordinated with Massachusetts Waterways Program staff who provided the Acts and Resolves passed by the General Court of Massachusetts in 1966. The Acts and Resolves provide a latitude and longitude description of the angle points of the harbor line, which is the latest available documentation of the line. For reference, the 1966 harbor line has been added to the following figures included in the Draft EA/Final EIR: Figure 3-1 (pg. 3-8), Figure 3-2 (pg. 3-14), and Figure 3-3 (pg. 3-19).

ID #	Comment	Response
C.9	The DEIR states the proposed project aims to avoid and minimize impacts to wetland resource areas and will likely contribute to ongoing shellfish restoration. These benefits will need to be clarified in the FEIR.	Several deck designs and pile configurations were considered for the Proposed Project. The selected deck and pile alternative used the fewest piles with the smallest impact footprint as summarized in Section 2.3.2 (pg. 2-17), Table 2-5 (pg. 2-19) and Table 2-7 (pg. 2-20) of Chapter 2, *Proposed Action and Alternatives* of the Draft EA/Final EIR. Although mitigation efforts have not been finalized, coordination with the Division of Marine Fisheries (DMF) has determined that recovery and relocation of shellfish resources is not likely to provide benefits due to the low numbers of individuals. The DMF determined that Massport should contribute to a shellfish restoration program ongoing elsewhere within Boston Harbor, documented in Appendix C, *Agency Correspondence* of the Draft EA/Final EIR. Contributions to the DMF shellfish program will be finalized during permitting of the Project (see also Section 4.2.1.3 [pg. 4-3] of Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*).
C.10	The FEIR should quantify all permanent and temporary impacts to grassland habitat and specify locations for pavement removal and restoration as detailed in comments from NHESP and outlined in the Scope.	Grassland habitat will be impacted by the proposed relocation of the airfield perimeter roadway and a small area of new pavement at the end of Runway 27 to widen the paved shoulder to 300 feet. Relocation of the roadway and conversion of grassland outside of the new roadway and runway shoulder paving will reduce grassland habitat within the NHESP polygon by approximately 20,300 square feet. An additional 22,000 square feet of grassland will be temporarily altered for construction laydown, material storage, and equipment operations (refer to Section 3.4.4.1 [pg. 3-18] of Chapter 3, *Affected Environment and Environmental Consequences.* During the project permitting process, Massport will work with FAA, NHESP, and Massport Operations to identify suitable airfield locations where existing pavement can be removed to replace the impacted grassland habitat. Temporarily altered grassland will be restored in place with a seed mix approved by NHESP. Massport's goal is to have no net loss of protected grassland habitat.

ID #	Comment	Response
C.11	The DEIR does not identify the projected climate conditions and assumptions, such as predicted rates of sea level rise and precipitation rates associated with future storms that may impact the proposed RSA deck; the FEIR should provide this information. The FEIR should also discuss whether Massport will engage in adaptive management strategies to further elevate its runway infrastructure in the future. In addition, comments for MassDEP indicate Massport will need to provide stormwater management for the increased impervious area. The FEIR should discuss how the stormwater system will be sized to address future climate conditions including increased precipitation as outlined in the Scope.	Based on the RMAT Climate Resilience Design Standards Tool output report (RMAT Output Report), the Project is identified as having a high initial risk rating due to exposure to sea level rise/storm surge, extreme precipitation due to urban flooding, and extreme heat (see Appendix E.3, *RMAT Output Report*). The RSA deck will have a 75-year design life. The proposed RSA is required by FAA and would be constructed partially on land and partially on a deck over Boston Harbor. Massport raised the Runway 27 threshold 10 inches during a 2020 safety rehabilitation of Runway 9-27 to account for sea level rise. The RMAT Output Report included projected impacts from sea level rise and storm surge through the 2050 and 2070 planning horizon. The projected sea level rise for both these planning horizons are summarized in Table 3-6 (pg. 3-25). Due to FAA's design guidelines, the maximum elevation above Mean Sea Level of the RSA is tied directly to existing runway and taxiway elevations. Its runway end position cannot be adjusted beyond FAA design specifications. Based on FAA safety requirements, the project design will not be able to meet the RMAT design recommendations. However, Massport has an airport flood management program in place, which includes the *Massport Floodproofing Design Guide*, and continually enhances the program to improve resiliency of Airport assets. In the final design, the proposed stormwater system will be sized to address future climate conditions regarding sea level rise and increased precipitation.

ID #	Comment	Response
C.12	The FEIR should estimate the number of marine vessel traffic anticipated during the construction period and should provide an overall quantitative estimate of GHG emissions anticipated during the construction period. As discussed above, the FEIR should analyze the extent to which flights may be diverted during the construction period so as to increase impacts including air/GHG emissions over EJ populations.	As described in Section 3.3.2.1 (pg. 3-11) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences,* a maximum of 15 marine vessels could be deployed daily during the construction period. The construction period emissions inventory (Table 3-2 and Table 3-3 [pgs. 3-11 and 3-12] of Chapter 3) identifies that Project-related construction emissions, including marine vessel emissions, are under the General Conformity *de minimis* thresholds (per year) for criteria pollutants. As shown in Table 3-5 [pg. 3-24] of Chapter 3, marine vessels are anticipated to generate approximately 649 tons of GHG emissions in 2025 and 586 tons of GHG emissions in 2026. Construction associated with the Proposed Project would result in the temporary closure of Runway 9-27 during each of the planned 60-day construction periods as described in Section 3.3.2.1 (pg. 3-9), in Draft EA/Final EIR Chapter 3. During construction, aircraft operations are anticipated to temporarily shift from Runway 9-27 to other runways, temporarily increasing the number of operations along the existing flight paths of the other runways (overall operations would remain the same with the equivalent decrease in Runway 9-27 operations). The choice of which runway configurations FAA will use for approach and departure routes will continue to be driven by wind, weather, and FAA safety requirements. Since the temporary closure will not alter the number of operations or aircraft types flown, overall aircraft GHG emissions from Logan Airport will remain the same. Based on wind and weather conditions, aircraft could be shifted from Runway 9-27 with or without the Proposed Project. Short-term changes in air traffic procedures not to exceed six months to accommodate airport construction such as during the proposed Runway 9-27 closures are categorically excluded from environmental analysis because FAA has determined that this type of action does not have a significant effect on the human environment (Section 5-6 of FAA Order 1050.1F).

ID #	Comment	Response
C.13	I encourage Massport to require that its contractors use construction equipment with engines manufactured to Tier 4 federal emission standards or select project contractors that have installed retrofit emissions control devices or vehicles that use alternative fuels to reduce emissions of volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD).	As described in Section 3.3.3 (pg. 3-12) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental* Consequences, to avoid and minimize construction-related emissions, the Proposed Project would incorporate best practices such as limiting idling and using Tier III or Tier IV equipment where feasible in off-road construction equipment. Where appropriate, diesel construction equipment would be retrofitted with diesel oxidation catalysts and/or particulate filters. Construction equipment will be maintained according to manufacturers' specifications and operated using USEPA-compliant fuels for on-road and off-road equipment and vehicle applications to minimize emissions.

C.14	The FEIR should follow Section 11.07 of the MEPA regulations for outline and content and provide the information and analyses required in this Scope. It should clearly demonstrate that the Proponent has sought to avoid, minimize and mitigate Damage to the Environment to the maximum extent practicable.	The organizational framework, methodology, analysis, and content contained in the Final EIR has been prepared in accordance with MEPA Regulations set forth in 301 CMR Section 11.00 et seq., including 301 CMR Section 11.07, "EIR Preparation and Filing." This document also serves as the Draft EA prepared in accordance with the requirements of NEPA. In the interest of meeting the page limits for an EA required by NEPA, while also complying with the content requirements of MEPA and NEPA, this Draft EA/Final EIR summarizes and incorporates by reference the DEIR for the Proposed Project. The Draft EA/Final EIR contains the information and analyses required per the Scope issued by the Massachusetts Secretary of Energy and Environmental Affairs (EEA). Measures to avoid, minimize, and/or mitigate potential impacts for each affected environmental resource category have been developed and are discussed in Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*. Proposed mitigation commitments are summarized in Table 4-1 (pg. 4-10). The size of the proposed RSA deck for Runway 27 was determined by FAA to be approximately 450 feet long and 306 feet wide. This size takes into consideration the use of an Engineered Materials Arresting System (EMAS) on the deck surface to slow and stop aircraft that may overshoot the runway. The design of the RSA deck and the materials used to construct the deck were up to Massport to determine. Use of a solid fill surface was considered and rejected for the extensive permanent impact to Boston Harbor from the filling and potential changes to currents and tides. This left an open pile structure as the only other alternative. The proposed RSA deck considered four different pile-supported deck designs. The number of piles, type of pile material (steel or concrete) and size of the piles (22-inch square or 5-foot diameter) were considered along with the impact to marine resources and the cost of each of the designs. The selected design proposes a deck with 326 twenty-inch square concrete piles spaced 20 feet apart in rows 50 feet apart. The preferred design minimizes the impact of the RSA deck by using the fewest number of piles and smallest overall pile footprint of the designs considered. In addition, concrete piles will be used since they generate less noise than steel piles during driving. The piles will be installed using a vibratory hammer when possible.

ID #	Comment	Response
C.15	The FEIR should describe the project and identify any changes since the filing of the ENF and DEIR. It should identify and describe state, federal and local permitting and review requirements associated with the project and provide an update on the status of each of these actions. The FEIR should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. The FEIR should include detailed site plans for existing and post-development conditions at a legible scale. The plans should include sections, and elevations to accurately depict existing and proposed conditions, including proposed above- and below-ground structures.	The Proposed Project has not changed since the filing of the ENF, nor the DEIR, as described in Draft EA/Final EIR Section 1.3.2 (pg. 1-4), of Draft EA/Final EIR Chapter 1, *Purpose and Need for the Proposed Action*. An electronic version of the DEIR is available on Massport's website at https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/. A summary list of the anticipated permits and approvals required for the Project is provided in Table 1-1 (pg. 1-5) of Draft EA/Final EIR Chapter 1. Applicable statutory and regulatory standards and requirements are described in Section 1.3 (pg. 1-3) of DEIR Chapter 1, *Project Description and Permitting*. A project plan of RSA Deck Support Alternative 2, the Proposed Action, is provided in Figure 2-11 (pg. 2-22) of Chapter 2, *Proposed Action and Alternatives,* at a scale of 1 inch = 250 feet and in Figure 3-3, "Coastal Resources Located within the Project Site," at a scale of 1 inch = 40 feet. The right-side panel of Figure 2-11 (pg. 2-22) includes a section profile along with the Proposed Project's dimensions and elevations. Pre-construction conditions are depicted in Figure 1-3 (pg. 1-6) of Chapter 1.

ID #	Comment	Response
C.16	The FEIR should describe the overall EJ outreach plan that the project intends to follow for the remainder of the MEPA review process, including any outreach it will conduct as part of the parallel federal NEPA process. The Proponent should address how any proposed stormwater management system would protect water quality in EJ populations.	Massport recognizes the importance of a robust outreach approach to ensure the public is aware of these reports and has an opportunity to review and comment. The following measures have been implemented for this filing: • Post a social media announcement notifying the public of upcoming filing. • Circulate the Draft EA/Final EIR electronically to the EJ Reference List provided by MEPA. • Translate the Notice of Availability into Spanish. • Translate the Executive Summary into Spanish. • Post Draft EA/Final EIR on Massport's website at the time of filing with MEPA, allowing for approximately an additional week of review time. The updated EJ outreach plan that Massport intends to follow is provided in Appendix E.5, *Updated Environmental Justice Outreach Plan*. Stormwater management for the proposed RSA deck and the impervious surface created by the associated perimeter road improvements will be designed as part of the project's final design; it will be collected, treated, and discharged in compliance with the current Massachusetts Stormwater Management Standards and approved during permitting. The discharge of the project area will be sent directly to Boston Harbor, which is a water body subject to tidal flowage. Complying with the Massachusetts Stormwater Standards will protect the water quality in Boston Harbor for EJ and non-EJ populations. There would be no adverse impacts to EJ and non-EJ populations, and no resulting disproportionate adverse impacts to EJ populations due to flooding, water discharge, or pollution.

C.17	The FEIR should supplement its analysis of impacts on EJ populations, specifically, with respect to the potential for disproportionate adverse impacts that may result from redirected flights during the construction period. The FEIR should clarify whether any of the identified EJ populations are located within the flight paths to which planes are expected to be redirected during the construction period; with what frequency (based on existing data) the redirected flights are anticipated to extend over the EJ areas (thereby increasing air emissions impact); and how this increased impact compares to already existing deviations in flight patterns due to normal weather conditions. The FEIR should clarify whether the identified EJ populations would be affected from the redirected flights more than non-EJ populations and should clearly explain the methodology for any conclusion of no adverse impact, including the methodology for selecting a "comparable area" for purposes of comparing impacts to EJ populations in accordance with the MEPA Interim Protocol on Analysis of EJ Impacts.	Section 6.4 in DEIR Chapter 6*, Environmental Justice and Public Outreach*, evaluates whether an existing unfair or inequitable environmental burden related to public health consequences has been placed upon EJ communities, as compared to the general population, located within 1 mile of the Project Site. An enhanced analysis of the potential for the Project to result in disproportionate and adverse effects to EJ populations is included in Section 3.12 (beginning on pg. 3-41) and Table 3-11 (pg. 3-47) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences.* Refer also to Appendix E.4, *Environmental Justice Supporting Documentation*, and Appendix E.5, *Updated Environmental Justice Outreach Plan*. Construction associated with the Proposed Project would result in the temporary closure of Runway 9-27 during each of the planned 60-day construction periods. Short term changes in air traffic procedures not to exceed six months to accommodate airport construction such as during the proposed Runway 9-27 closures are categorically excluded from environmental analysis because FAA has determined that this type of action does not have a significant effect on the human environment (Section 5-6 of FAA Order 1050.1F). Since no new flight paths will be in use during construction, there would be no additional impact to neighboring communities, including EJ communities. The proposed RSA improvements will not change how Logan Airport operates or have any effect on runway capacity or types of aircraft that could use the runway. Therefore, no changes to the Airport noise profile would occur with the Project. Based on wind and weather conditions, aircraft could be shifted from Runway 9-27 with or without the Proposed Project. During the closures, aircraft operations are anticipated to temporarily shift from Runway 9-27 to other runways, temporarily increasing the number of operations along the existing flight paths of the other runways (overall operations would remain the same with the equivalent decrease in Runway 9-27 operations). The choice of which runway configurations FAA will use for approach and departure routes will continue to be driven by wind, weather, and FAA safety requirements. If FAA is utilizing a northeast flow aircraft traffic pattern, aircraft that would have departed from Runway 9 are expected to shift primarily to Runway 4R; in a southwest flow, aircraft that would have landed on Runway 27 are

ID #	Comment	Response
		expected to primarily shift to Runway 22L. In a northwest flow, aircraft that would have landed or departed on Runway 27 are expected to shift primarily to Runway 33L or Runway 32. There is expected to be minimal impact from the Project on the continued preferential use of Runway 15R for late-night departures and Runway 33L for late-night arrivals (a noise abatement procedure to route late-night operations over water rather than over noise-sensitive land uses). Any shifting of flights to other runways would be utilizing existing flight paths. During the summer of 2021, approximately 10 percent of arrivals used Runway 27. Based on a similar closure in 2020 to Runway 9-27, these arrivals primarily used Runway 22L instead. During the 2021 period, approximately 24 percent of departures used Runway 9 and 9 percent used Runway 27. During the similar closure of Runway 9-27 in 2020, most of the Runway 9 departures shifted to Runway 4R and a small portion to Runway 15R. The Runway 27 departures shifted primarily to Runway 22R. However, as stated above, the choice of runways to use by FAA will be based on wind, weather, and safety requirements at the time of runway closure. As described in Section 3.12.2.2 (pg. 3-43) of Draft EA/Final EIR Chapter 3, there are census block groups within 1 mile of the Project Site that are considered EJ populations according to the EEA Environmental Justice Maps Viewer (EJ Maps Viewer) (refer to Table 3-9 [pg. 3-43] and Figure E.5-1 [pg. E.5-4] of Appendix E.5). Table 3-11 (pg. 3-47) of Draft EA/Final EIR Chapter 3 concludes that no disproportionate adverse impacts to EJ populations are anticipated because of the temporary re-routing of aircraft operations away from these EJ communities in the vicinity of Runway 9-27 during the construction period.

ID #	Comment	Response
C.18	The FEIR should estimate the number of marine vessel trips anticipated during the construction period and provide a qualitative description of whether marine traffic will extend near the identified EJ populations (and if so, describe the routes of travel) and what measures will be taken to minimize air impacts on residential neighborhoods similar to the mitigation measures to be taken for construction vehicles.	As described in Section 3.3.2.1 (pg. 3-11) of Draft EA/Final EIR, *Chapter 3, Affected Environment and Environmental Consequences,* a maximum of 15 marine vessels could be deployed daily during the construction period. Barges and tugboats are expected to be utilized to bring in most construction materials to the site (except for materials used for landside elements, cast-in-place concrete, and EMAS blocks and associated materials). Use of barges and tugboats would help to minimize construction-related vehicle traffic on roads, minimize potential impacts to airfield operations, to allow for timely material delivery, and to stockpile materials away from the airfield. The water transportation staging area would be at the contractor's off-site yard and is anticipated to be in Quincy, East Boston, or Charlestown. Personnel would primarily be transported by watercraft to and from the construction site. The routes that the marine vessels would take will depend on the nature of the load and type of construction activity. It is anticipated that barges and other vessels supporting construction activities would maneuver in an area up to 220 feet on each side of the footprint of the proposed RSA deck and 250 feet off the end of the deck. Because Runway 9-27 would be closed for the duration of the two 60-day construction periods, barges would be moored overnight within the area but outside the designated navigation channel. The RSA improvements would occur near an active navigation channel that provides public boating access to Belle Isle Inlet and other areas of Winthrop and East Boston. Although near the channel, the proposed RSA deck would be approximately 175 feet away from the edge of the channel. During construction, marine vessels may occupy portions of the navigation channel intermittently but would not preclude use of the channel by the public. As described in Section 3.3.2.1 (pgs. 3-10 to 3-11), construction would generate short-term air emissions, including exhaust emissions from marine vessels. The construction period emissions inventory (Table 3-2 and Table 3-3 [pgs. 3-11 and 3-12] of Chapter 3) identifies that Project-related construction emissions, including marine vessel emissions, are under the General Conformity *de minimis* thresholds (per year) for criteria pollutants.

ID #	Comment	Response
C.19	Comments from MassDEP state that at a minimum, treatment of the deck runoff is needed. MassDEP notes that previously, the Runway 33L and 22R RSA work was found to increase the proposed velocity of the runoff to the point that it would erode the substrate in the underlying resource areas. The increase to turbidity to resource areas from uncontrolled release of stormwater generated by the proposed RSA is not addressed in the DEIR. Comments from MassDEP state that stormwater control measures need to be proposed to provide water quality treatment and reduce the velocity of the runoff to demonstrate compliance with 310 CMR 10.05(6)(k)1-10. The FEIR should address stormwater compliance and whether the proposed stormwater design would be sufficient to accommodate future storms in light of future climate conditions as detailed in the Climate Scope below.	Stormwater management for the proposed RSA deck and the impervious surface created by the associated perimeter road improvements will be designed as part of the project's final design; runoff will be collected, treated, and discharged in compliance with the Massachusetts Stormwater Management Standards and approved during permitting. Since the receiving waters are tidal, a waiver will be requested regarding post-development peak discharge rates, as described in Section 3.14.3 (pg. 3-56) of Draft EA/Final EIR, Chapter 3, *Affected Environment and Environmental Consequences*. Additionally, the water depth at the end of the deck is approximately 20 feet deep, which will prevent the possibility of discharged stormwater causing any seabed erosion or turbidity. Massport is also undertaking an airport-wide drainage study that will provide an analysis of the airport's existing drainage system and provide validation where improvements are necessary to handle the 10-year storm event.

C.20	The DEIR asserts that the project will not require a Wetlands Protection Act (WPA) variance and that the deck construction over wetland resource areas will meet the performance standards for work in those resource areas. As described in MassDEP's comment letter, which is incorporated by reference herein, the Agency does not concur and points to the following: No demonstration has been made that the Project as proposed will comply with Stormwater Management requirements specified at 310 CMR 10.05(6)(k)1, 2, and 3. 485 square feet of Coastal Beach would be altered and converted to hard bottom by the emergency egress ramps with no mitigation. The FEIR should demonstrate the project as proposed will meet the performance standards of the WPA for each Resource Area, including appropriate mitigation to address permanent impacts.	Stormwater management for the proposed RSA deck and the impervious surface created by the associated perimeter road improvements will be designed as part of the project's final design; it will be collected, treated, and discharged in compliance with the applicable Massachusetts Stormwater Management Standards and approved during permitting. Refer to C.5 above for how the project complies with each of the Stormwater Management standards and see Section 3.14, "Water Resources," (beginning on pg. 3-53) of Chapter 3, *Affected Environment and Environmental Consequences*. The total area of Coastal Beach impacted by the two proposed emergency access/egress ramps is estimated to be 490 square feet (approximately 510 square feet total of Coastal Beach would be directly impacted by the RSA deck piles and the two emergency access ramps). The Coastal Beach was identified as consisting of both a rocky surface and a small area of muddy sand. The hard surface of the ramps, although different than the existing rocky surface, will still be a hard bottom surface. Approximately 490 square feet of the egress ramps will extend into the soft bottom (mud flat) of the Coastal Beach (see Figure 3-3 [pg. 3-19] and Table 3-4 [pg. 3-17] of Chapter 3). The Performance Standards for Coastal Beach require no adverse impact by "*increasing erosion, decreasing the volume, or changing the form of any such coastal beach or an adjacent or downdrift coastal beach."* This does not by definition necessarily require mitigation, provided there is no adverse impact. The proposed ramps within the Coastal Beach will be a low profile (similar in grade) and will extend only approximately 10 feet into the Beach. The small area of impact will not cause erosion and will not change the landform (such as a jetty) or interfere with the downdrift of sediment along the shoreline. The access ramps are therefore not anticipated to have an adverse impact to Coastal Beach. However, MassDEP has requested mitigation be provided for the small area of impact to Land Under Ocean and Coastal Beach from the proposed deck piles. Approximately 710 square feet of Land Under the Ocean and Coastal Beach (that is mud flat) will be impacted by the placement of 252 piles. The additional 490 square feet of impacted Coastal Beach mud flat will be added to a proposed mitigation area. Approximately 1,200 square feet of mitigation area will be provided to replace the mud flat and Land Under Ocean lost from the pile installations and egress ramps. Details of the proposed mitigation will be provided as part of the Project WPA

ID #	Comment	Response
		permitting effort. The mitigation would be expected to include some form of shoreline restoration in Boston Harbor or Chelsea Creek or could involve mud flat creation like Massport conducted to offset impacts associated with the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. Compliance with the Massachusetts WPA performance standards was provided in DEIR Section 5.2.
C.21	Additional comments from DMF request that a record of project coordination between DMF and other resource agencies to develop a detailed mitigation plan for permanent impacts to shellfish and mud flat habitat be included in Appendix C: Agency Correspondence of the FEIR. DMF request that this record also contain documentation related to badged shellfishers continued access to the site following construction.	Records of project coordination between Massport and the Massachusetts DMF, as well as other resource agencies, regarding the development of a detailed mitigation plan for permanent impacts to shellfish and mud flat habitat are included in Draft EA/Final EIR Appendix C, *Agency Correspondence*. Documentation related to badged shellfishers' continued access to the site following construction is also included in Appendix C. Refer also to Section 4.2.1 (beginning on pg. 4-2) of Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings,* for proposed mitigation for permanent impacts to shellfish and mud flat habitat.
C.22	Project mitigation should include the recommended time-of-year restriction for in-water, silt-producing work from February 15 to June 30 to minimize impact to winter flounder and the use of turbidity curtains to contain turbidity associated with in-water silt-producing work occurring outside of the recommend TOY to minimize impacts to spawning and early life history stages of shellfish species in the vicinity of the project.	Massport has committed to not conduct any in-water construction activities from February 15 to June 30 of any year. When in-water construction does occur, outside the time-of-year restriction, turbidity curtains will be installed around the work area to contain and limit the extent of any turbidity created by the construction activities. Refer also to Section 4.2.1 (pg. 4-2) of Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings,* for proposed mitigation.

ID #	Comment	Response
C.23	Comments from the MassDEP Waterways Program request the FEIR include the following additional information related to Chapter 91 and the state harbor line to confirm the project is consistent with the pertinent statutes: Confirmation there are no further modifications to the state harbor line in this location subsequent to the 1966 Act; The location of the state harbor line be added to all project plans and exhibits related to Chapter 91 in the Final EIR and the eventual Waterways License Application; Documentation suitable to demonstrate that the project complies with Chapter 733 of the Acts of 1966 and any subsequent statute to the extent applicable.	A former License plan illustrating the revised State Harbor Lines and the Acts and Resolves of the General Court of Massachusetts from 1966 that describes the harbor lines was provided to Massport by MassDEP. This information was used to illustrate the harbor lines on the Project figures. The State Harbor Lines are approximately 2 feet outside the toe of the existing embankment of the airfield and have been added to the Project figures (see Draft EA/Final EIR Figure 3-1 (pg. 3-8), Figure 3-2 (pg. 3-14), and Figure 3-3 (pg. 3-19)). The proposed RSA deck will extend approximately 460 feet beyond the established (1966) State Harbor Lines. Massport has determined that the enabling legislation for the establishment of Logan Airport allows necessary airport facilities to extend beyond the State Harbor Lines without legislative approval.
C.24	Comments from MassDEP also request that relocating shellfish be addressed as an alternative in accordance with 310 CMR 10.34 (6).	A survey of shellfish within the Project Area determined very low numbers of soft shell clams (*Mya arenaria*) and razor clams (*Ensis directus*) are present as demonstrated in Section 3.4.3 (pg. 3-16) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*. Collection and relocation of shellfish from within the Project limits was discussed with representatives of the DMF as mitigation. However, due to the low numbers of shellfish within the Project Area, the DMF believed it would be more beneficial for Massport to contribute to a shellfish restoration program as described in Section 4.2.1.3 (pg. 4-3) of Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*. To mitigate for pile placement, Massport will continue to work with DMF through the permitting process, to identify the appropriate value of the contribution to the shellfish restoration program.

ID #	Comment	Response
C.25	The FEIR should include an updated PBD narrative which demonstrates consistency with the regulations.	The Public Benefits Determination Regulations (310 CMR 13.00) establish a procedure for the Secretary of the EEA to ensure that public benefits are protected and/or provided by nonwater-dependent projects within tidelands, pursuant to the authority granted under M.G.L. c. 91, Section 18B. The regulations provide that the public benefit determination will not in any way impair DEP's exercise of its powers under Chapter 91 and that MassDEP will incorporate the public benefit determination into the official record of the Chapter 91 decision. Section 3.6.5 (beginning on pg. 3-29) of Chapter 3, *Affected Environment and Environmental Consequences*, documents the purpose and effect of the project, impacts on abutters and the surrounding community, enhancements to the property, benefits to the public trust rights in tidelands, environmental protection and preservation, and public health and safety and general welfare. The RSA improvements will address an overriding public interest in aviation safety. Safety enhancements to the RSA reduce the potential for injury to passengers, aircraft crew, and first responders. RSAs reduce the risk of damage to aircraft and injury to persons inside the aircraft should the aircraft overrun, undershoot, or veer off the runway.

ID #	Comment	Response
C.26	Comments from NHESP indicate it is not clear whether the enhancements to the RSA will or will not result in a Take (321 CMR 10.18(2)(b)) of state-listed species. NHESP requests the Proponent identify all permanent and temporary impacts to grassland habitat along with any proposed removal of existing excess pavement to create grassland restoration area.	As described in Section 3.4.4 (pg. 3-17) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, existing grassland at the airfield is suitable habitat for upland sandpiper and eastern meadowlark. Grassland habitat would be impacted by the Project as the result of relocating the vehicle perimeter road to a safer, more perpendicular crossing of the Runway 27 End. In the new position, the grass area between the existing roadway and the new road will be replaced with crushed stone. This will maintain a porous surface but will eliminate the need for mowing outside the perimeter road. The impact to grassland habitat from the roadway relocation is estimated to be approximately 17,400 square feet. An additional area of approximately 3,000 square feet of grassland habitat will be impacted by paving a rectangular area on the south side of the runway end to provide a continuous 300-foot-wide paved area for the runway and shoulders as required by FAA. About 20,300 square feet of total grassland habitat would be permanently altered. Massport will work with NHESP program to develop mitigation for the loss of approximately 20,300 square feet of grassland by removing an equal area of pavement elsewhere on the airfield within designated rare species habitat. During the project permitting process, Massport will work with FAA, NHESP, and airport operations to identify locations where this grassland habitat can be replaced on the airfield to avoid a take and avoid the need for a Conservation Management Plan. Construction activities including lay down of materials, equipment operations, and construction staging will temporarily alter approximately 22,000 square feet of additional grassland habitat near the end of Runway 27. The temporary impacts will be during two 60-day construction periods in 2025 and 2026 (total of 120 days). Active construction is anticipated to occur between July and October. Once project construction has been completed, the disturbed area will be restored and reseeded with a seed mix approved by NHESP to reestablish the grassland habitat.

ID #	Comment	Response
C.27	The Proponent should specify whether the anticipated timeline for the commencement of construction related noise will occur during the tern nesting season (May-July).	Project construction is anticipated to be limited to two 60-day windows between July and October, in 2025 and 2026, to avoid the in-water work time-of-year restriction recommended by the DMF from February 15 to June 30. Construction activities may occur during a portion of the tern nesting season (July). The nearest known tern nesting habitat is Snake Island, approximately 2,000 feet to the northeast of the Project Site. Field observations of terns on Snake Island identified that noise generated by aircraft operations had little or no impact on bird behavior (refer to DEIR Appendix D.5, *Snake Island Habitat Evaluation*). Impacts from construction activities are not anticipated to impact tern nesting. See Section 5.5 (pg. 5-29) of DEIR Chapter 5, *Impact Assessment*.
C.28	The Proponent should continue to consult with NHESP as the project design progresses.	Massport has and will continue to consult with NHESP as the design of the Project progresses and the permitting process is underway. Agency consultation is documented in Draft EA/Final EIR Appendix C, *Agency Correspondence*.

C.29	The FEIR should discuss how the project will be impacted by sea level rise in 2050 and 2070, the planning horizon identified by the MA Climate Resilience Design Standards Tool prepared by the Resilient Massachusetts Action Team (RMAT).	To address this issue, Massport met with MEPA on October 5, 2022, regarding the results of the RMAT Climate Resilience Design Standards Tool Output Report and how the project will be impacted by sea level rise. An RMAT report was completed for the DEIR in April 2022 using then-current Version 1.1. Massport updated the RMAT analysis using the updated version of the RMAT Tool, Version 1.2 (July 29, 2022). The updated output report generated from the RMAT Climate Resilience Design Standards Tool in October 2022 is provided in Draft EA/Final EIR Appendix E.3, *RMAT Output Report*. As summarized in Table 3-6 (pg. 3-25), of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, sea level rise is anticipated to increase approximately 3 feet and 5 feet above current levels for the 2050 and 2070 planning horizons respectively. Over the course of the Project's useful life, sea level rise is predicted to impact the Project Area as it will be more susceptible to flooding during high tide and storm events. Increased flood risk is demonstrated by the increase in all metrics illustrated in Table 3-6 (pg. 3-25). This would result in three quarters to all land in the Project Area to be perpetually inundated, as indicated in Appendix E.3, *RMAT Output Report.* Due to FAA's design guidelines, the maximum elevation above Mean Sea Level of the RSA is tied directly to existing runway and taxiway elevations. The runway end position cannot be adjusted beyond FAA design specifications. Based on FAA safety requirements, the project design will not be able to meet the RMAT design recommendations since it will not be possible to raise the entire airfield and runway system. However, Massport has an airport flood management program in place, which includes the *Massport Floodproofing Design Guide*, and continually enhances the program to improve resiliency of Airport assets. Massport recognizes that some assets may be inundated by flooding or excessive precipitation for certain short-term periods and has worked to flood-proof light vaults and other features, and to identify operational changes to runways and taxiways to accommodate drying out before being returned to service. In 2020, Massport raised the Runway 27 threshold by 10 inches. As part of that project, Massport also improved the drainage system. In the unlikely event that the RSA deck is temporarily flooded, Runway 9-27 would be taken out of service until safe operation could resume. The RSA would not be occupied other than for periodic maintenance or in the

ID #	Comment	Response
		event of an aviation emergency. Massport has in place an active resiliency program, including the *Massport Floodproofing Design Guide*, sustainability policy, and is undertaking developing a Climate Action Plan for the Authority including a net zero GHG emissions roadmap titled *Roadmap to Net Zero by 2031*. These impacts from sea level rise and Massport policy are discussed in Section 3.5.3.2 (pg. 3-24) of Draft EA/Final EIR Chapter 3.
C.30	The FEIR should compare the resiliency of key project components, including elevation of the runway safety area and the stormwater system, against the recommendations from the Tool. Specifically, the FEIR should discuss whether the elevation of the runway safety area is consistent with recommendations from the MA Resilience Design Tool for the 2050 and 2070 planning horizon	Table 3-6 (pg. 3-25) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, and Appendix E.3, *RMAT Output Report*, identify sea level rise and storm surge impacts through the 2050 and 2070 planning horizons. Within both planning horizons, most land within the Project Area is inundated with sea level rise anticipated between 3 and 5 feet depending on planning horizon. As discussed in Section 3.5.3.2 (pg. 3-24) of Draft EA/Final EIR Chapter 3, FAA design guidelines for RSAs and EMAS limit the ability for the Project to be designed within the recommendations of the RMAT Climate Resilience Design Standards Tool as the development of Project is tied to existing runway and taxiway elevations. Regardless, Massport is dedicated to protecting its assets at Logan Airport through its floodproofing design guidelines. Additionally, in advance of this Project, Massport preformed a safety rehabilitation of Runway 9-27 which raised the runway threshold by 10 inches, the maximum allowable within FAA design guidelines as well as improved the runway drainage system. The 10-inch adjustment was made to account for any potential safety area construction extending out into Boston Harbor and sea level rise. The increase in elevation of Runway 9-27 results in a proposed deck which would be higher than the Runway 4R End light pier and Runway 33L End RSA deck. These efforts and further resiliency are described in Section 3.5.3.2 (pg. 3-24) of Draft EA/Final EIR Chapter 3.

ID #	Comment	Response
C.31	To the extent project design is not anticipated to meet these recommendations, the FEIR should discuss whether Massport will engage in adaptive management strategies to improve resiliency of project assets in the future.	As discussed in Section 3.5.3.2. (pg. 3-24) of Draft EA/Final EIR of Chapter 3 *Affected Environment and Environmental Consequences*, the Proposed Project will face sea level rise impacts within the 2050 to 2070 planning horizons causing the land within the Project Area to be perpetually inundated. In 2020, in advance of the Project, the 9-27 Runway threshold was elevated 10 inches, the maximum within FAA criteria, to accommodate for sea level rise as well as improvements to the RSA. The rise in elevation of the Runway results in a proposed deck which would be higher than the Runway 4R End light pier and Runway 33L End RSA deck This development was done within the *Massport Floodproofing Design Guide* and Massport's airport flood management program. The *Massport Floodproofing Design Guide* was introduced in 2014 with the intent of protecting Massport's coastal assets with evolving coastal changes and is updated regularly. Massport's flood management program is continuously enhanced to improve resiliency and adaptation at the airport to protect assets from climate change-related impacts. The Massachusetts Coastal Flood Risk Model is also used to assess potential flooding vulnerabilities for Massport projects along the coastline. Additionally, Massport has several ongoing authority wide resilience programs to improve resiliency at the airport as well as lessen the airport's overall impact to climate change. These includes evolving sustainability policy, developing a Climate Action Plan, and a net zero GHG emissions roadmap titled *Roadmap to Net Zero by 2031*.

ID #	Comment	Response
C.32	The FEIR should provide a qualitative assessment of marine vessel traffic as stated in the Environmental Justice section above and provide an overall quantitative estimate of GHG emissions anticipated during the construction period (including truck traffic). As noted, the FEIR should supplement the analysis of air emissions impacts on EJ populations as described above. The FEIR should revise mitigation commitments relative to GHG emissions based on this analysis.	To minimize roadway traffic and accommodate larger structural pieces, barges and tugboats are expected to be utilized to bring in most construction materials to the site (except for materials used for landside elements, cast-in-place concrete, and EMAS blocks and associated materials). Use of barges and tugboats would help to minimize construction-related vehicle traffic on roads, minimize potential impacts to airfield operations, to allow for timely material delivery, and to stockpile materials away from the airfield. As described in Section 3.3.2.1 (pg. 3-11) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, a maximum of 15 marine vessels could be deployed daily during the construction period. The water transportation staging area would be at the contractor's off-site yard and is anticipated to be in Quincy, East Boston, or Charlestown. Construction workers would primarily be transported by watercraft to and from the construction site. The routes that the marine vessels would take will depend on the staging area, nature of the load, and type of construction activity underway. The construction period emissions inventory (Table 3-2 and Table 3-3 [pgs. 3-11 and 3-12] of Chapter 3) identifies that Project-related construction emissions, including marine vessel emissions, are under the General Conformity *de minimis* thresholds (per year) for criteria pollutants. As shown in Table 3-5 [pg. 3-24] of Chapter 3, marine vessels are anticipated to generate approximately 649 tons of GHG emissions in 2025 and 586 tons of GHG emissions in 2026. Thus, the project would not have any adverse impacts on the general population, nor EJ populations.

ID #	Comment	Response
C.33	The FEIR should provide the supplemental analysis of air quality impacts during the construction period, as indicated above, The FEIR should provide an overall update on the project's construction-period impacts and mitigation relative to noise, air quality, water quality, and transportation, based on further development and/or changes to the proposed project. It should confirm that the project will require its construction contractors to use Ultra Low Sulfur Diesel fuel, and discuss the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters.	Section 3.3 (pg. 3-9) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, provides a summary of air quality impacts for criteria pollutants and demonstrates that for the construction period, modeled emissions would be below General Conformity *de minimis* Thresholds (per year) for criteria pollutants (Table 3-2 [pg. 3-11] of Chapter 3). Massport will require its construction contractors to use Ultra Low Sulfur Diesel fuel and encourage the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters. Construction period impacts remain the same as documented in the DEIR. Draft EA/Final EIR Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*, describes the mitigation commitments.
C.34	The FEIR should include a separate chapter summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a comprehensive list of all commitments made by the Proponent to avoid, minimize, and mitigate the environmental and related public health impacts of the project, and should include a separate section outlining mitigation commitments relative to EJ populations. The filing should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in a tabular format organized by subject matter (wetlands, rare species, stormwater, environmental justice, etc.) and identify the Agency Action or Permit associated with each category of impact. Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project. The filing should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing to ensure that adequate measures are in place to mitigate impacts associated with each development phase.	Refer to Chapter 4, *Proposed Mitigation and Draft Section 61 Findings*, for information on mitigation measures that would be implemented with the Proposed Project, including mitigation measures for construction period impacts. Draft Section 61 Findings are provided in Section 4.4 (pg. 4-8) of Draft EA/Final EIR Chapter 4 for each permit to be issued by state agencies. Table 4-1 (pg. 4-10) of Draft EA/Final EIR Chapter 4 provides information on the proposed mitigation commitments, including the approximate cost, implementation schedule, and responsible party.
C.35	The FEIR should contain a copy of this Certificate and a copy of each comment letter received. It should include a comprehensive response to comments on the ENF that specifically address each issue raised in the comment letter; references to a chapter or sections of the FEIR alone are not adequate and should only be used, with reference to specific page numbers, to support a direct response.	A copy of the DEIR Certificate issued by the Secretary of the EEA on October 8, 2022, a copy of each comment letter received, and response to comments, are included herein in this Draft EA/Final EIR Appendix A, *Response to DEIR Comments*.

ID #	Comment	Response
C.36	The Proponent should circulate the FEIR to each Person or Agency who previously commented on the DEIR, each Agency from which the Project will seek Permits, Land Transfers or Financial Assistance, and to any other Agency or Person identified in the Scope.	Massport will circulate and distribute the Draft EA/Final EIR in accordance with 301 CMR 11.16 (3). Accordingly, the Draft EA/Final EIR will be distributed to previous commenters on the ENF or DEIR, to all agencies identified by the Secretary in the Scope, and to all agencies for which the Proposed Project seeks permits. Please refer to Appendix G*, Distribution List*, for the list of agencies and persons to whom the Draft EA/Final EIR will be distributed to. The distribution list also includes representatives of governmental agencies and community groups and/or local residents interested in activities at Logan Airport. The Draft EA/Final EIR is also publicly available on Massport's website (https://www.massport.com/logan-airport/about-logan/environmental-reports/).
C.37	The Proponent should send a letter accompanying the digital copy or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. If submitted in hard copy, the FEIR submitted to the MEPA office should include a digital copy of the complete document.	The Draft EA/Final EIR was circulated and distributed in accordance with 301 CMR 11.16. The Draft EA/Final EIR is available on Massport's website (https://www.massport.com/logan-airport/about-logan/environmental-reports/), which is accompanied by information on how to obtain a paper copy in accordance with 301 CMR 11.16(3)(c). Printed copies of the Draft EA/ Final EIR are available upon request and are also available for review at the public libraries listed in Appendix G*, Distribution List,* of the Draft EA/Final EIR.

This Page Intentionally Left Blank

DEIR Comment Letters

1. Commonwealth of Massachusetts, Department of Environmental Protection (MassDEP) – Boston Waterways Regulation Program
2. Commonwealth of Massachusetts, Department of Environmental Protection – Northeast Regional Office (MassDEP-NERO)
3. Commonwealth of Massachusetts, Division of Marine Fisheries (DMF)
4. Commonwealth of Massachusetts, Division of Fisheries and Wildlife - Natural Heritage and Endangered Species Program (NHESP)
5. Massport Community Advisory Committee (MCAC)
6. Winthrop Town Council
7. Winthrop Air Hazards Committee (John Vitagliano)
8. Winthrop Board of Health (Bill Schmidt)
9. Airport Impact Relief, Incorporated (AIR, Inc.)
10. Margaret Roberts (Winthrop Citizen)

This Page Intentionally Left Blank

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Bethany A. Card
Secretary

Martin Suuberg
Commissioner

Memorandum

To: Bethany A, Card, Secretary, EOEEA

Through: Jennifer Hughes, MEPA

From: MassDEP/Boston Waterways Regulation Program

Cc: Daniel Padien, MassDEP/Boston Waterways Regulation Program

Re: **Comments from the Chapter 91 Waterways Regulation Program - EEA #16433 DEIR for Airport Runway 27 End Runway Safety Area Improvements Project at Logan Airport, Flowed Tidelands of Boston Harbor, Boston, Suffolk County.**

Date: August 22, 2022

The Department of Environmental Protection Chapter 91 Waterways Regulation Program (the "Department") has reviewed the above-referenced Draft Environmental Impact Report submitted by VHB on behalf of Massachusetts Port Authority (the "Proponent") for runway end safety improvements on Logan Airport's Runway 27 including work within flowed tidelands subject to licensing under Chapter 91 and the regulations at 310 CMR 9.00

Chapter 91 Comments:

In response to the Department's comments on the ENF relating to harbor lines, the DEIR references Chapter 170 of the Acts of 1880 as the origin of the state harbor line at the project site and asserts that any harbor lines that may have existed would no longer be in effect. Since the filing of the ENF, Massport has conferred with the Waterways Program and together identified Chapter 733 of the Acts of 1966 which modified the state harbor line and appears to be generally consistent with the modern build-out of the airfield.

The Department requests the Final EIR include the following additional information related to Chapter 91 and the state harbor line to confirm the project is consistent with the pertinent statute(s):

1-1

1. Confirmation there are no further modifications to the state harbor line in this location subsequent to the 1966 Act;

2. The location of the state harbor line be added to all project plans and exhibits related to Chapter 91 in the Final EIR and the eventual Waterways License Application.
3. Documentation suitable to demonstrate that the project complies with Chapter 733 of the Acts of 1966 and any subsequent statute to the extent applicable.

1-1

The Waterways Program stands ready to confer with the Massport team as needed to confirm the location of the current state harbor line prior to the filing of the Final EIR. Furthermore, the Department looks forward to receipt of a Chapter 91 application after issuance of the Secretary's Certificate on the MEPA filing. The application and plans should be prepared in accordance with the Department's minimum filing standards and should more clearly identify the project details and scope relative to Chapter 91 jurisdictional boundaries. Details and references to Wetlands Protection Act Resource Areas and other program/agency thresholds do not need to be included with the Chapter 91 application materials. The Proponent is encouraged to contact the Department with any questions and to confirm the appropriate Chapter 91 application type prior to submittal.

If there are any questions regarding the Department's comments, please contact DEP.Waterways@mass.gov.

Letter 2

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Bethany A. Card
Secretary

Martin Suuberg
Commissioner

August 22, 2022

Bethany A. Card, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

Attn: MEPA Unit

RE: Boston
Boston Logan International Runway 27 End
Runway safety Area (RSA) Improvements
Project
EEA # 16433

Dear Secretary Card:

The Massachusetts Department of Environmental Protection Northeast Regional Office (MassDEP-NERO) has reviewed the Draft Environmental Impact Report (DEIR) for the proposed Boston Logan International Runway 27 End Runway safety Area (RSA) Improvements Project in Boston. MassDEP provides the following comments.

Wetlands

The project requires a mandatory EIR because it requires a State Agency Action and involves a new non-water dependent use or expansion of an existing non-water dependent structure provided the use or structure occupies one or more acres of waterways or tidelands (301 CMR 11.03(3)(a)5.). The selected alternative proposes construction of a Runway Safety Area (RSA) deck at the end of Runway 27 The RSA deck will be 306 feet wide and would be supported by pilings and/or caissons starting on land for approximately 150 feet, then extending 450 feet into the harbor. The EMAS dimensions will determine the final dimensions of the RSA deck. This will result in a surface area of approximately 137,000 square feet of decking (approximately 3.2 acres) over the harbor supported by 326 square twenty-inch concrete piles.

The following Resource Areas will be impacted by the deck: 45,420 sf of Land Subject to Tidal Action, 2660 square feet of Coastal Beach, 97,200 sf of Land Subject to Coastal Storm Flowage (100-year Floodplain), 107,700 sf of Land Under the Ocean, and 66,760 sf of Land Containing Shellfish.

The DEIR states that permanent impacts to resource areas consist only of impacts from the 326 pilings, or 910 square feet. It further details that only 246 of the 326 pilings would be installed in wetlands resource area making the impact area 690 square feet. The DEIR asserts that this "represents a loss of less than one percent of the 107,700 square feet of natural substrate under the deck." The DEIR states that the deck would overshadow 2.47 acres of the seabed but does not address the shading impacts from the deck or its effect on shellfish The performance standard for Land Containing Shellfish is no adverse effect on productivity caused by several factors including alterations in water circulation, alterations in the distribution of sediment grain size, and changes in water quality.

The DEIR includes a detailed analysis of the preferred pier support structure, including the number and types of pilings, caissons, and an assessment of potential effects on scour and accretion of the harbor bottom and adjacent shoreline. The study in the DEIR concludes that the chosen alternative, called Deck Support Alternative 2, "would result in the lowest volume of seabed scour" and that "even with the artificially increased approach velocities…and the resultant scour effects, under the slow rates of erosion illustrated by this analysis, the scour volumes for all of the alternatives would be modest at the proposed deck site and would need to undergo very long-term spring tides to achieve their maximum predicted scour volumes." The scour analysis also indicates that no changes to sediment grain size or distribution would be anticipated in the vicinity of the proposed RSA deck.

The DEIR also acknowledges that there could also be a potential change in productivity of Land Containing Shellfish beneath the deck due to a potential change in the distribution of sediment. The DEIR indicates that "Massport has initiated discussion with DMF and badged shellfishers regarding impacts to softshell clam and associated habitat. Mitigation for the lost shellfish habitat will be developed in consultation with the DMF and other applicable agencies." Massport acknowledges that the new hard surface offered by the pilings would shellfish habitat for species such as blue mussel but not clams and that there could be a resultant loss in commercial value for clams. 8,630 square feet of Land Containing Shellfish would be directly impacted by the installation of concrete pavers and riprap to create the emergency egress ramps. Massport plans to offer compensatory mitigation in the form of an in-lieu fee paid to the U.S. Army Corps of Engineers as well as a state shellfish habitat restoration program as guided by the DMF. Payment of an in-lieu fee does not meet the performance standards contained in the Massachusetts Wetlands Protection regulations for any Resource Area. The DEIR acknowledges that phytoplankton and algae will be negatively impacted by shadow form the proposed deck. MassDMF has recommended that the proponent continue to coordinate with DMF and other resource agencies to develop a detailed mitigation plan for permanent impacts to shellfish and mud flat habitat. Mudflats are classified as Coastal Beaches (310 CMR 10.27(1)). MassDMF recommends a time of year (TOY) restriction for pile installation from February 15 to June 30 to minimize impact to winter flounder and the use of turbidity curtains to contain turbidity associated with in-water silt-producing work occurring outside of the recommend TOY. While MassDEP concurs that a TOY will mitigate for

2-1

some construction related impact, a demonstration is still needed that performance standards will be met for each Resource Area and appropriate mitigation provided to address permanent impacts. Relocating shellfish should be addressed as an alternative (310 CMR 10.34(6)). 2-1

The DEIR asserts that the project will not require a variance and that the deck construction over the affected Resource Areas will meet the Performance standards for work in those Resource Areas. MassDEP does not concur based on the information provided in the Draft EIR. For example, no demonstration has been made that the Project as proposed will comply with Stormwater Management requirements specified at 310 CMR 10.05(6)(k)1, 2, and 3. The DEIR proposes no new stormwater management structures for a deck adding more than 3.5 acres of impervious area to the airport. The proposed deck creates new impervious surfaces, so at a minimum, treatment of the runoff from the deck is needed. Previously, the Runway 33L and 22R RSA work was found to increase the proposed velocity of the runoff to the point that it would erode the substrate in the underlying a resource areas. 2-2 2-3 The increase to turbidity to resource areas from uncontrolled release of stormwater generated by the proposed RSA does not appear to have been addressed in the Draft EIR. Stormwater control measures need to be proposed to provide water quality treatment and reduce the velocity of the runoff to demonstrate compliance with 310 CMR 10.05(6)(k)1-10.
The section on Federally Regulated Resource Areas indicates that 10,340 square feet of fill will be placed below the annual high tide line, 880 square feet of from the 316 piles and 9460 square feet for the emergency egress ramps. This activity will therefore also trigger a 401 Water Quality Certification application. The direct impacts to mudflat consist of 280 square feet for pilings and 490 square feet of fill for the emergency egress ramps. 485 square feet of Coastal Beach would be altered and converted to hard bottom by the emergency egress ramps. No mitigation is offered even for the so-called direct impacts. 2-4

Will a pier be required by FAA to house a lighting structure at Runway End 27 RSA, similar to Runway End 33L? If so, an evaluation of resource impacts, alternatives, and potential mitigation measures to offset impacts should be conducted in the Final EIR." 2-5

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Rachel.Freed@mass.gov at (978) 694-3258 for further information on wetlands issues. If you have any general questions regarding these comments, please contact me at John.D.Viola@mass.gov or at (978) 694-3304.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Eric Worrall, Rachel Freed, Phil DiPietro, MassDEP-NERO

Letter 3

The Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street, Suite 400, Boston, MA 02114
p: (617) 626-1520 | f: (617) 626-1509
www.mass.gov/marinefisheries

CHARLES D. BAKER, Governor
KARYN E. POLITO, Lt. Governor
KATHLEEN A. THEOHARIDES, Secretary
RONALD S. AMIDON, Commissioner
DANIEL J. MCKIERNAN, Director

July 28, 2022

Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Erin Flaherty
100 Cambridge Street, suite 900
Boston, MA 02114

RE: EEA# 16433 Boston Logan International Airport Runway 27 End Runway Safety Area (RSA) Improvements Project

Dear Secretary Theoharides:

The Massachusetts Division of Marine Fisheries (MA DMF) has reviewed the Draft Environmental Impact Report (DEIR) for the proposed Runway Safety Area Improvements Project located along Boston Harbor in Boston, MA. The project includes the construction of a new 198,900sf deck of which, approximately 153,000sf would extend over Boston Harbor. The work includes the installation of 326 piles in the project area to support the deck and the construction of two emergency egress ramps on either side of the proposed deck.

The Project Area includes the following marine fisheries resources:

- 66,760sf of subtidal and intertidal area mapped as shellfish habitat by DMF for soft-shell clam (*Mya arenaria*) and blue mussel (*Mytilus edulis*) within shellfish growing areas GBH5.2 and GBH5.3, classified as Conditionally Restricted for shellfish harvest, and GBH5.0, classified as Prohibited for shellfish harvest. The shellfish survey conducted by the proponent on April 29, 2021, identified the presence of low numbers of live soft-shell clams (*Mya arenaria*), razor clams (*Ensis directus*) and surf clams (*Spisula solidissima*). The shellfish survey also identified several areas of numerous dead adult soft-shell clams and the presence of blue mussels attached to the armoring rock in the vicinity of the project area. Subtidal video surveys conducted by the proponent on June 10, 2021, identified the presence of European oysters (*Ostrea edulis*).
- 37,210sf of intertidal area mapped as tidal flats by the MA DEP Wetlands Conservancy Program.
- 107,700sf of subtidal area mapped as essential habitat for the spawning and early development of winter flounder (*Pseudopleuronectes americanus*) by DMF. Video surveys conducted by the proponent on June 10, 2021, identified the presence of juvenile flounder.

- Side scan sonar and underwater video surveys conducted by the proponent within the Project Area did not detect the presence of eelgrass (*Zostera marina*).

MA DMF concurs with the proponents intentions to present additional environmental analysis to resource and permitting agencies and the public in a Final Environmental Impact Report (FEIR). Based on the information provided in the Draft Environmental Impact Report we offer the following recommendations and comments:

Impacts to Marine Resources

- We are satisfied with the level of detail provided in the DEIR regarding the structures supporting the deck including: estimates of area impacted, construction BMPs to be used, and an alternatives analysis.

- As noted in the DEIR, we recommend the proponent continue to coordinate with DMF and other resource agencies to develop a detailed mitigation plan for permanent impacts to shellfish and mud flat habitat. We recommend that a record of this coordination be included in 'Appendix C: Agency Correspondence' of the FEIR. 3-1

- We are satisfied that the proponent has coordinate with DMF to present the project plans and environmental impacts to the group of Logan licensed badged shellfishers. We concur that badged shellfishers be allowed access to the site following construction. We recommend that a record of this coordination be included in 'Appendix C: Agency Correspondence' of the FEIR. 3-2

- We are satisfied with the level of detail provided in the DEIR regarding the timeline of the project, particularly the amount of time expected to complete all in-water work. We concur with the proponents plan to adhere to the recommended time of year (TOY) restriction for in-water silt-producing work, e.g. pile installation, from February 15 to June 30 to minimize impact to winter flounder and the use of turbidity curtains to contain turbidity associated with in-water silt-producing work occurring outside of the recommend TOY to minimize impacts to spawning and early life history stages of shellfish species in the vicinity of the project [1]. 3-3

Thank you for considering our comments. If you have questions about this review, please email Forest Schenck at Forest.Schenck@mass.gov.

Sincerely,

Daniel J McKiernan

Daniel J. McKiernan

Director

DM/fs/sd

cc.
C. Jacek, USACE
R. Boeri, MA CZM
K. Shaw, NMFS
S. Dalzell, Massport
G. Bettencourt, MA DMF
J. Kennedy, MA DMF

References:
[1] Evans, NT, KH Ford, BC Chase and JJ Sheppard (2011). Recommended Time of Year Restrictions (TOYs) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts. Technical Report DMF TR-47.

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

August 22, 2022

Bethany Card, Secretary
Executive Office of Energy and Environmental Affairs
Attention: MEPA Office
Jennifer Hughes, EEA No. 16433
100 Cambridge St.
Boston, Massachusetts 02114

Project Name:	Boston Logan International Airport, Runway 27 End Runway Safety Area (RSA) Improvements Project
Proponent:	Massachusetts Port Authority (Massport)
Location:	One Harborside Drive, Boston – Boston Logan International Airport
Project Description:	Enhance the RSA at Runway 27 End with a 650-foot long by 306-foot-wide pile supported deck with Engineered Materials Arresting System (EMAS) to meet Federal Aviation Administration (FAA) requirements
Document Reviewed:	Draft Environmental Impact Report
EEA File Number:	16433
NHESP Tracking No.:	21-40134

Dear Secretary Card:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the Division) reviewed the *Draft Environmental Impact Report* (DEIR) for the proposed Boston Logan International Airport, Runway 27 End Runway Safety Area (RSA) Improvements Project in Boston, Massachusetts and would like to offer the following comments.

As indicated in the *Massachusetts Natural Heritage Atlas* (15th Edition), the proposed project site is mapped as *Priority Habitat* for a state-listed species: Upland Sandpiper (*Bartramia longicauda*), Endangered and Eastern Meadowlark (*Sternella magna*), Special Concern. Additionally, as detailed in the DEIR, Snake Island located east of the project location supports Common Tern (*Sterna hirundo*) and Least Tern (*Sternula antillarum*), species state-listed as Special Concern. These species and their habitats are protected pursuant to the Massachusetts Endangered Species Act (M.G.L c. 131A) and its implementing regulations (MESA, 321 CMR 10.00). Portions of the proposed projects will occur within *Priority Habitat*, which will require a direct filing with the Division for compliance with the Massachusetts Endangered Species Act (MESA 321 CMR 10.00).

According to the information submitted within the DEIR the proposed Runway Safety Area (RSA) Improvements Project has been designed in consultation with FAA to enhance safety at the Runway 27 End. The Preferred Alternative includes a 650-foot long by 306-foot-wide pile supported deck with an Engineered Materials Arresting System (EMAS) bed to slow aircraft that extend into the RSA. The proposed deck will extend from the Runway 27 End into Boston Harbor.

Based on the information presented in the DEIR, the project would result in both temporary and permanent impacts to grassland habitat. If the project is limited to temporary grassland impacts that occur outside of the grassland bird breeding season (April 15- August 15) and the grassland is restored with a compatible native seed mix, the Division anticipates that this project could be conditioned to avoid a prohibited Take of state-listed species and their habitats. However, if the project will result in an overall loss of grassland habitat, then the project may result in a prohibited Take of state-listed species habitat. The DEIR details there may be the potential to offset the loss of grassland habitat with restoration of existing excess pavement to suitable grassland habitat.

At this time, it is not clear whether the Enhancements to the Runway Safety Area will or will not result in a Take (321 CMR 10.18(2)(b)) of state-listed species. The Proponent should identify all permanent and temporary impacts to grassland habitat along with any proposed removal of existing excess pavement and grassland restoration area. The Proponent should specify whether the anticipated timeline for the commencement of construction related noise will occur during the tern nesting season (May – July). The Proponent should continue to consult the Division as the project design progresses. The Division anticipates working with the Proponent to resolve concerns for state-listed species and their habitats associated with the Project through the MESA review process (321 CMR 10.18, 10.23). 4-1

While it may be possible to design the proposed project to avoid a Take, the Division notes that projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species. If the Project is determined to result in a Take and requires a CMP to proceed, the Division will not render a final decision until the MEPA review process and its associated public and agency comment period is complete.

As our MESA review is not complete, no alteration to the soil, surface, or vegetation and no work associated with the proposed project shall occur on the property until the Division has made a final determination.

If you have any questions about this letter, please contact Amy Hoenig, Endangered Species Review Biologist, at (508) 389-6364 or Amy.Hoenig@mass.gov. We appreciate the opportunity to comment on this project.

Sincerely,

Everose Schlüter

Everose Schlüter, Ph.D.
Assistant Director

cc: Stewart Dalzell, Massport
Boston City Council
Boston Conservation Commission
Boston Planning Department
DEP Northeast Regional Office, MEPA

Massport Community Advisory Committee
c/o Law Office of Robert Allen Jr., LLP
300 Washington Street
Brookline, MA 02445

Letter 5

August 19, 2022

By email: Jennifer.hughes@state.ma.us

Jennifer Hughes, Analyst
Massachusetts Environmental Policy Act Office
Executive Office of Energy & Environmental Affairs
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: Boston Logan International Airport Runway 27 End Runway Safety Area (RSA) Improvements Project (EEA #16433)

Dear Ms. Hughes:

Thank you for the opportunity to submit comments on behalf of the Massport Community Advisory Committee (MCAC) on the Draft Environmental Impact Report (DEIR) for the above-referenced project. The project involves building a Runway Safety Area (RSA) at the end of Runway 27 to meet Federal Aviation Administration (FAA) current design criteria for airports. As Logan International Airport is a land-constrained airport, meeting the design criteria would require building a deck out over Boston Harbor at the east end of Runway 27 extending approximately 450-feet over the harbor and measuring 306-feet wide. An Engineered Materials Arresting System (EMAS) would provide this RSA with the functionality required by the FAA. Representatives from the MCAC attended the MEPA hearing on this project on July 20, 2022 and hosted an additional public meeting on August 10, 2022. These comments are based solely on feedback from members that attended those meetings as well as the information provided in the DEIR.

As you may know, the MCAC is a legislatively created body made up of representatives from the thirty-five communities impacted by Massport's operations. The MCAC oversees and provides recommendations to Massport to minimize operational impacts on the member communities. Additionally, the MCAC reviews Massport's annual report and makes recommendations to the Governor and the Legislature thereon.

The MCAC is fully supportive of Massport's and the FAA's goals of making air travel safer. It is my understanding that this project is intended to provide an added level of safety for flights utilizing Runway 9-27 by providing an additional overshoot area and access for emergency personnel should that be necessary. According to the DEIR this project "**would improve safety but would not extend the runway nor have any effect on normal runway operations, runway capacity, or types of aircraft that use the runway."** DEIR, page ES-1. Massport representatives stressed this as a critical point in both recent public meetings on this project. Obviously, runway use and capacity is extremely important to our member communities, including what types of aircraft can use which runways and when they operate. The fact that this project is exclusively designed to increase safety and will not increase runway capacity or types of aircraft that use the runway are of paramount importance.

Massport Community Advisory Committee
c/o Law Office of Robert Allen Jr., LLP
300 Washington Street
Brookline, MA 02445

Any project that proposes extending out and above the harbor must also consider the effects of climate change that are already upon us and projected to increase in intensity in the coming years. The DEIR includes as Appendix F the RMAT Output Report. This project of the Commonwealth of Massachusetts is designed to analyze the vulnerability of projects to the effects of climate change. Not surprisingly, this project is identified in the RMAT report as having "high exposure" to sea level rise/storm surge, extreme precipitation, and extreme heat. It is located within the predicted mean high-water shoreline by 2030 and exposed to the 1% annual coastal flood event during this period as well. I note this only to stress the importance of the cost/benefit analysis that must be considered when spending $110 million on a project of this type. In favoring this alternative to provide the necessary safety outcomes, other alternatives were analyzed and dismissed due to operational problems and delays that could have been caused. It is important that potentially longer-term solutions were fully vetted prior to expending this amount of money on what could be a project of limited functional duration. Without having been presented with a full cost/benefit analysis, we only note this as a concern. In any case, due to the impacts of the project on the intertidal area, as well as the potential vulnerability to sea level rise, it would be appropriate to provide support for other projects or initiatives that would mitigate the effects of climate change when this project is built. 5-1

Thank you for this opportunity to provide comments on this project. If you have any questions, please feel free to contact me at (617) 906-8853 or atoffler@massportcac.org.

Very truly yours,

Aaron Toffler, Executive Director
Massport Community Advisory Committee

Copies by Electronic Mail to:
Massport Community Advisory Committee
John Nucci, Massport Board Representative
Stewart Dalzell, Deputy Director, Environmental Planning and Permitting, Massport
Thomas Butler, Deputy Director of Government & Community Affairs, Massport

EEA No. 16433 – DEIR

To: Bethany A. Card, Secretary, EOEA
Jennifer Hughes, MEPA

CC: Winthrop Town Manager Anthony Marino, State Senator Lydia Edwards, State Representative Jeffrey Turco, Governor Charlie Baker, Lt. Governor Karen Polito, Assistant Speaker of the U.S. House of Representatives Katherine Clark, U.S. Senator Edward Markey, U.S. Senator Elizabeth Warren, Mike Vatalaro (Massport), Stewart Dalzell (Massport), Roseann Bongiovanni (Massport CAC)

Thank you for the opportunity to comment on the recently released Draft Environmental Impact Report (DEIR) on the Runway 27 Safety Area Improvement Project. While we understand the necessity for the RSA Improvements as a means of reducing risk to passengers, per FAA guidance, the Town of Winthrop will undoubtedly experience negative environmental impacts both during construction and upon completion of the project. During the public comment period for the ENF in September of 2021, it is notable that of the 14 reported comments, 7 were from Winthrop residents. This speaks volumes to the impacts anticipated by our community. Also of note, the other 7 comments were from state agencies or environmental groups.

The DEIR outlines "minimal, but direct impacts to coastal resources, habitat, and plants…" as well as "temporary, minor increases in noise, emissions of air pollutants, water quality effects […], and surface traffic"[1]. All the aforementioned impacts are routine issues that Winthrop encounters due to its proximity to Logan. The DEIR confirms that this project will exacerbate the detrimental impacts to the Winthrop community's quality of life due to our proximity to the airport.

Due to the mandatory nature of the RSA Improvement project, we are pragmatic in our understanding of what can and cannot be done to offset the negative environmental impacts of this specific initiative to Winthrop. Because the boundaries of the construction sit within Boston property and merely abut Winthrop, and Snake Island is anticipated to experience minimal impacts, little can be done for the community as it directly relates to the physical boundaries of this project. However, **by taking a global view of the environmental impacts Logan Airport has on the Town of Winthrop, we believe there is an opportunity for environmental mitigation overall.**

6-1

We are imploring Massport to look broadly at its environmental impact on Winthrop and commit to making a good faith effort to mitigate the negative effects of Logan Airport operations on our community. Broad environmental mitigation should be deployed as a means of mitigating the additional environmental impacts on Winthrop from the RSA Improvement project.

[1] https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf
[2] https://www.massport.com/media/41rkxcxd/2018-19-edr_final-part-1.pdf
[3] Erickson, L. E., Newmark, G. L., Higgins, M. J., & Wang, Z. (2020). Nitrogen Oxides and ozone in urban air: A review of 50 plus years of progress. *Environmental Progress & Sustainable Energy*, *39*(6). https://doi.org/10.1002/ep.13484
[4] Guerreiro C, Ortiz AG, Leeuw FD, et al. Air Quality in Europe - 2018 Report. Copenhagen, Denmark: European Environment Agency; 2018.
[5] https://www.town.winthrop.ma.us/sites/g/files/vyhlif8421/f/pages/winthrop_infographic.pdf

Massport should address two key impacts to Winthrop – **air quality issues**, via air quality monitoring and funding to improve our tree canopy, and **noise levels**, via expediting the already agreed upon re-soundproofing efforts.

Air Quality

Due to the frequency of flights arriving and departing from runways 4, 22, 9, and 27 and the known emissions including VOCs, Oxides of Nitrogen, and particulates, it is obvious that the air quality in Winthrop is subpar at best.

According to the 2018/2019 Logan Airport Environmental Data Report, there was a 32.4% increase in particulate matter generated by Logan airport, with 60% of that increase coming from aircraft[2]. The EDR also shows an upward trend in nitrogen oxides, which on its own irritates the respiratory system[3], and when combined with VOCs and particulates, largely contributes to the production of ozone, which has been shown to negatively impact not only respiratory health, but also cardiovascular health[4].

While we appreciate a dedication to supporting Winthrop via East Boston Neighborhood Health's Asthma and COPD programs in response to studies showing poor air quality in our town, this is not nearly enough to combat the intense public health impact from our proximity to Logan.

We are requesting additional air quality sensors and testing for the town of Winthrop. Most importantly in the Point Shirley and Court Road neighborhoods – where particulate matter can be physically seen on homes, and the air quality is most at risk. A study was conducted in conjunction with Olin University and Air, Inc. several years ago, but an updated assessment of our current air quality is needed.

Funding the planting and maintenance of trees in Winthrop is also requested as a means of mitigating air pollution brought on by the airport. The EDR noted an increase in CO_2 emissions in 2019 over 2017. Trees not only help negate these negative environmental impacts but will also improve the overall environmental health of the town. Years of airport impacts have devastated our ecology and climate resilience, and a significant amount of tree planting can make progress in reversing these impacts.

Sound Insulation

The noise levels caused by airport operations are not simply a nuisance to Winthrop residents, but a serious environmental and health concern. A 2020 Boston University Community Sound Lab analysis showed that between 7pm and 7 am, noise levels reached above 65 dBA – loud enough to disrupt sleep - 5 minutes per hour, or 9.1% of the night[5].

[1] https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf
[2] https://www.massport.com/media/41rkxcxd/2018-19-edr_final-part-1.pdf
[3] Erickson, L. E., Newmark, G. L., Higgins, M. J., & Wang, Z. (2020). Nitrogen Oxides and ozone in urban air: A review of 50 plus years of progress. *Environmental Progress & Sustainable Energy*, *39*(6). https://doi.org/10.1002/ep.13484
[4] Guerreiro C, Ortiz AG, Leeuw FD, et al. Air Quality in Europe - 2018 Report. Copenhagen, Denmark: European Environment Agency; 2018.
[5] https://www.town.winthrop.ma.us/sites/g/files/vyhlif8421/f/pages/winthrop_infographic.pdf

Massport Sound Contours regularly include areas of Winthrop within the 65 DNL range (often referred to as an 'uninhabitable' noise level), with some areas over 70 DNL.

The 201/2019 EDR noted that the number of Winthrop residents within the 65 DNL contour line increased from 2017 to 2018. It was also indicated that the contour lines over the Point Shirley neighborhood both lengthened and widened between 2017 and 2018, largely due to an increased usage of Runway 272.

Within the analysis of Noise data by the ENR, it was noted that the only one of Massport's 30 noise monitors located in various cities and towns surrounding the airport, only one, the monitor located on Point Shirley, recorded DNL that exceeded modeled estimates. The conclusion was that modeled DNL levels and sound contours are conservative estimates of noise – a concept that most residents of Winthrop would agree with. This discrepancy indicates that Winthrop's noise levels are in excess of what is expected through mathematical calculations, further supporting the idea that our community deserves noise mitigation.

These facts are not shocking, but Massport's sluggish response to the FAA's willingness to fund re-soundproofing efforts for homes initially treated before 1993, is. Community members have asked over the past two years to expedite the process so we can see relief being brought to the community to no avail.

Initiating contact with eligible homes to move the re-soundproofing efforts into the next stage of the process is a non-negotiable ask for our residents. People's lives hang in the balance as they await the much needed, and well-deserved relief from the 'uninhabitable' noise levels that Logan subjects our residents to.

In addition to our asks for air quality monitoring, funding for trees, and an expeditious advancement of sound insulation project, we believe that the Winthrop Conservation Committee should be consulted during the planning and permitting process for this project. While the RSA pilings and pier will be on Boston property it clearly abuts Winthrop's property, and thus our marine, tidal, and coastal ecosystems. 6-2

Thank you for your consideration on these important matters, and we look forward to working with you to bring these requests to fruition.

Sincerely,

James Letterie, Town Council President

Stephen Ruggiero, Town Council Vice President, Precinct 6

Tracey Honan, Councilor at Large

[1] https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf
[2] https://www.massport.com/media/41rkxcxd/2018-19-edr_final-part-1.pdf
[3] Erickson, L. E., Newmark, G. L., Higgins, M. J., & Wang, Z. (2020). Nitrogen Oxides and ozone in urban air: A review of 50 plus years of progress. *Environmental Progress & Sustainable Energy*, *39*(6). https://doi.org/10.1002/ep.13484
[4] Guerreiro C, Ortiz AG, Leeuw FD, et al. Air Quality in Europe - 2018 Report. Copenhagen, Denmark: European Environment Agency; 2018.
[5] https://www.town.winthrop.ma.us/sites/g/files/vyhlif8421/f/pages/winthrop_infographic.pdf

Robert DeMarco, Councilor at Large

Richard Fucillo, Councilor, Precinct 1

John Munson, Councilor, Precinct 2

Hannah Belcher, Councilor, Precinct 3

Barbara Flockhart, Councilor, Precinct 4

Joseph Aiello, Councilor, Precinct 5

[1] https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf

[2] https://www.massport.com/media/41rkxcxd/2018-19-edr_final-part-1.pdf

[3] Erickson, L. E., Newmark, G. L., Higgins, M. J., & Wang, Z. (2020). Nitrogen Oxides and ozone in urban air: A review of 50 plus years of progress. *Environmental Progress & Sustainable Energy*, *39*(6). https://doi.org/10.1002/ep.13484

[4] Guerreiro C, Ortiz AG, Leeuw FD, et al. Air Quality in Europe - 2018 Report. Copenhagen, Denmark: European Environment Agency; 2018.

[5] https://www.town.winthrop.ma.us/sites/g/files/vyhlif8421/f/pages/winthrop_infographic.pdf

Letter 7

John Vitagliano
19 Seymour Street
Winthrop, MA 02152
617-846-1105

July 26, 2022

Bethany A Card, Secretary
Executive Office of Energy and Environmental Affairs
(EOEA) Attn: Jennifer Hughes, MEPA Analyst
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: Boston Logan International Airport
Runway 27 End Runway Safety Area Improvements Project, EEA No. 16433-DEIR

Dear Secretary Card:

I submit these comments in response to EEA No. 16433, DEIR- the proposed Runway 27 End Runway Safety Improvements Project for Boston Logan International Airport

The Project is egregiously flawed and detrimental to the environmental interests and rights of the Town of Winthrop. I urge the EOEEA to reject the EEA No. 16433 DEIR, specifically the "Preferred Alternative" described in Section 3.3.6 of the document.

- The Project clearly intrudes on the boundary of the Town of Winthrop, as indicated by the series of charts (including Massport documents) entitled "Winthrop Incursion", yet The Project fails to acknowledge this critical aspect. 7-1

  The DEIR states that the Project will impact 574,500 sf of filled tidelands on the site, including 117,300 sf of land containing shellfish, which as indicated on the charts, clearly lie within Winthrop's boundaries and therefore should be required to be reviewed and approved by Winthrop's Conservation Commission and other appropriate Town agencies and regulatory bodies including the Town Council.

  The Project would also impact the Winthrop navigation channel which provides maritime access to three yacht clubs in Winthrop and two in East Boston, and the Winthrop Landing which services the Winthrop Ferry service.

The project is detrimental to Winthrop's environmental interests, rights and quality of life because of its potential to increase the current excessive noise and air quality pollution on the

densely populated Point Shirley neighborhood which presently is impacted by 30% (127,288) of Logan Airport's total annual operations from Runway 9/27:

61,216 departures from Runway 9 (direct overflights).
41,974 arrivals from Runway 27(direct overflights).
24,076 departures from Runway 27 (sideline noise).
-Based on 2019 Massport data.

While the current Federal Aviation Administration (FAA) regulations do not allow the dimensions of new Runway Safety Areas (RSA) to be incorporated into allowable aircraft takeoff/landing operational runway length criterion of existing runways there is the potential that a future FAA administration might change the current policy and add RSA's to existing runways for assessing allowable runway lengths for takeoff criteria. Such a policy change would increase the allowable operational length of Runway 9/27 by 650 ft. to 7,651 ft. in accordance with The Project's recommendations, which would increase its daily operational utilization and ensuing direct noise and air quality pollution increases on the Point Shirley community. Therefore, it is in Point Shirley's environmental interest for The Project not to proceed.

A potentially acceptable alternative could be "Alternative 1-Declared Distances", a technique broadly used applied at numerous airports in the U.S. It would provide a full dimension RSA for Runway 27 without having to construct a facility in Boston/Winthrop Harbor. The Declared Distance alternative would likely require a modified Taxiway E to prevent Runway 9/27 and Runway 4R/22L conflicts.

I question the basic Massport premise of selecting the Logan Airport Runway 27 end for a Runway Safety Area project when there are three other locations-Runways 4R, 4L and 22L- that experience similar levels of aircraft operations that would benefit from an RSA:

- The proposed Runway 27 RSA location experiences an annual total of 61,216 Runway 9 flights which are all departures. Interestingly, there aren't *any* Runway 9 arrivals as indicated by the attached Massport chart indicating 0 Runway 9 approaches for the past 20 years which significantly limits the number of flights that would benefit from a Runway 27 RSA and significantly limits its functionality.
- However, the Runway 4R end experiences an annual total of 65,086 flights, including 22L departures and 4R arrivals., a significant increase compared to the Runway 27 end.
  Yet the Masspprt proposal has no provisions for a Runway 4R RSA.
- Also, the Runway 4L end experiences a total of 61,108 annual flights, including 22R departures and 4L arrivals, nearly equal to the Runway 27 location. Yet the Massport proposal has no provisions for a Runway 4L RSA.
- Also, the Runway 22L end experiences a total of 63,167 annual flights, including 22L arrivals and 4R departures, more than the Runway 27 end yet the Massport proposal has no provisions for a Runway 4L RSA.
  Based on Massport data.

Since the Runways 4L, 4R and 22L ends experience equal or greater aircraft operations compared to the DEIR proposed Runway 27 RSA location which would negatively impact the Point Shirley neighborhood of Winthrop I urge Massport to withdraw the Runway 27 ENF and develop less environmentally consequential alternatives.

Thank You,
John Vitagliano

Member: Winthrop Airport Hazards Committee

:attachments

2004 General Location Plan

Legend:

Approximate Massport Property Lines

Index of Prominent Airport Locations

1. Sky Chefs
2. MPA Wood Island Substation
3. MPA Facilities II
4. MPA Facilities III
5. U.S. Airways Hangar
6. MPA Pumping Station
8. Delta Hangar
8A. CNG Fuel Station
9. Northwest Hangar
11. Delta Reservations
13. UPS Cargo
14. Temporary Signature General Aviation Terminal
16. American Hangar
17. Terminal E West Parking Area
18. MPA Facilities I / Heating Plant
19. Terminal E
20. Terminal D
21. Terminal C Pier B
22. Terminal C Main Terminal
23. Terminal C Pier C
24. Terminal C Pier D
25. MPA Administration Building
26. ATC Tower
27. Terminal B Pier A(American)
28. Terminal B Parking Garage
29. Terminal B Pier B(USAirways)
30. Central Parking Garage
31. Terminal A Main Terminal (under renovations)
31A. Terminal A Passenger Tunnel
31B. Terminal A Satellite Terminal
33. Gate Gourmet Flight Kitchen
34. Hilton Hotel
37. MBTA Airport Station
38. Dollar Rent a Car
38A. Dollar Rent a Car
39. Avis Rent a Car
40. Electrical Maintenance Stockroom
41. Porter Street Substation
42. Hertz Rent a Car
45. Taxi Pool
46. BOS Fuel Farm/ Fuel Operations & Control Bldg.
47. MTA Response Station/ Electrical Substation
48. Future Toll Plaza at TWT
49. Budget Rent a Car
50. National Rent a Car
51. B.U. Office Building
53. Fire Dept. Boat House
54. General Aviation Hangar/ Continental Maintenance
55. Amelia Earhart Building Support
56. Northwest Cargo
57. FedEx Cargo
58. American & FedEx Cargo
59. Post Office Staging Area
60. MLR Properties
61. U.S. Postal Facility
62. U.S. Air/ United/ Continental Cargo
63. Cargo Building #63
65. Logan Office Center
66. Field Lighting Vault
67. BIF Electric Substation
68. Sky Chefs
69. Alamo Rent a Car
70. Harborside Hyatt Hotel
73. Terminal E Baggage Screening Building
74. Water Shuttle Pier
76. Limo Pool
77. Fuel Farm
78. Massport Fire-Rescue Headquarters
79. Satellite Fire Station
80. State Police K-9 Facility
81. West Parking Garage
82. Vent Building #7
83. Economy Lot #1
83A. Economy Lot #2
83B. Employee Parking
84. Bird Island Flats Garage
85. Fire-Rescue Boat Dock
86. Citgo Gas Station
87. Terminal E Walkway
88. Terminal A Walkway
89. Terminal C Walkway
90. Terminal B Walkways
91. Central Stockroom
92. Batch Plant and Trailers
93. United GSE Facility
94. United Hangar Support Facility
95. United Hangar

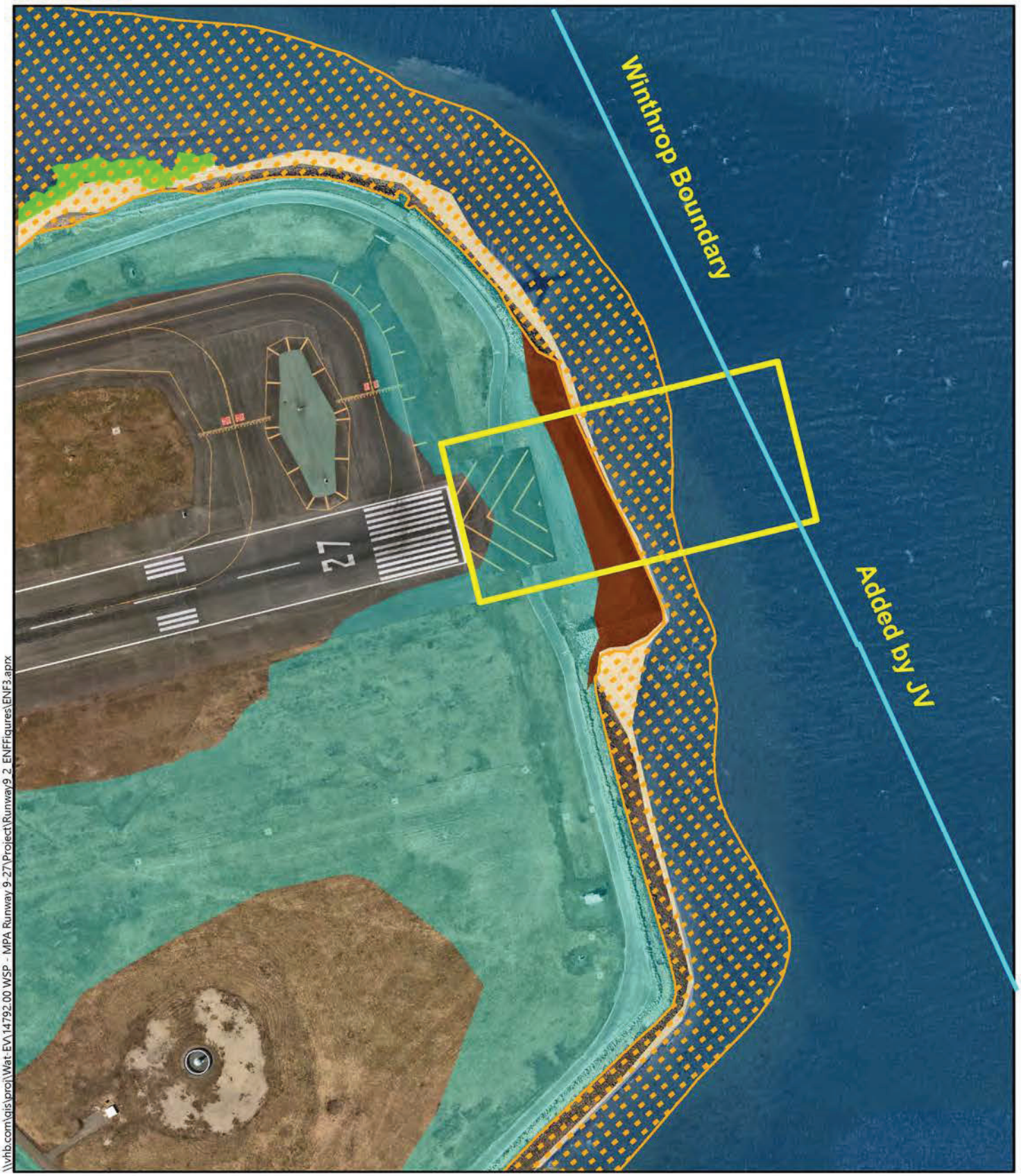
0 450 900 1800

In Feet

Logan International Airport
East Boston, MA

Massachusetts Port Authority
Capital Programs Department
March 2004

JV



\\vhb.com\gis\proj\Wat-EVA\14792.00 WSP - MPA Runway 9-27\Project\Runway 9_2 ENFFigures\ENF3.aprx

FIGURE 4: Preliminary Resource Areas **Runway 27 End RSA Improvements Project**

- Project Area
- FEMA 100-Year Flood Zone
- Land Under Ocean
- Coastal Beach
- Land Subject to Tidal Action
- Salt Marsh
- Designated Shellfish Growing Area Conditionally Restricted

0 125 250 500 Feet

Sources: VHB 2021, ESRI, Nearmap Imagery March 2021, MassGIS: FEMA 100-Year Flood Zone 2017, Salt Marsh 2019, Designated Shellfish Growing Area 2000

Constraints of Runway 9-27 Alternative 3A and 3B

- Would require an extensive environmental impact review process due to both permanent and construction impacts to coastal bank / intertidal flats, shellfish habitat, subtidal areas, terrestrial and marine threatened and endangered species, flood plains, and tidelands. Alternative 3A will have the largest impacts of any alternative considered.

- Likely to require environmental mitigation at a 2:1 or 3:1 rate of replacement.

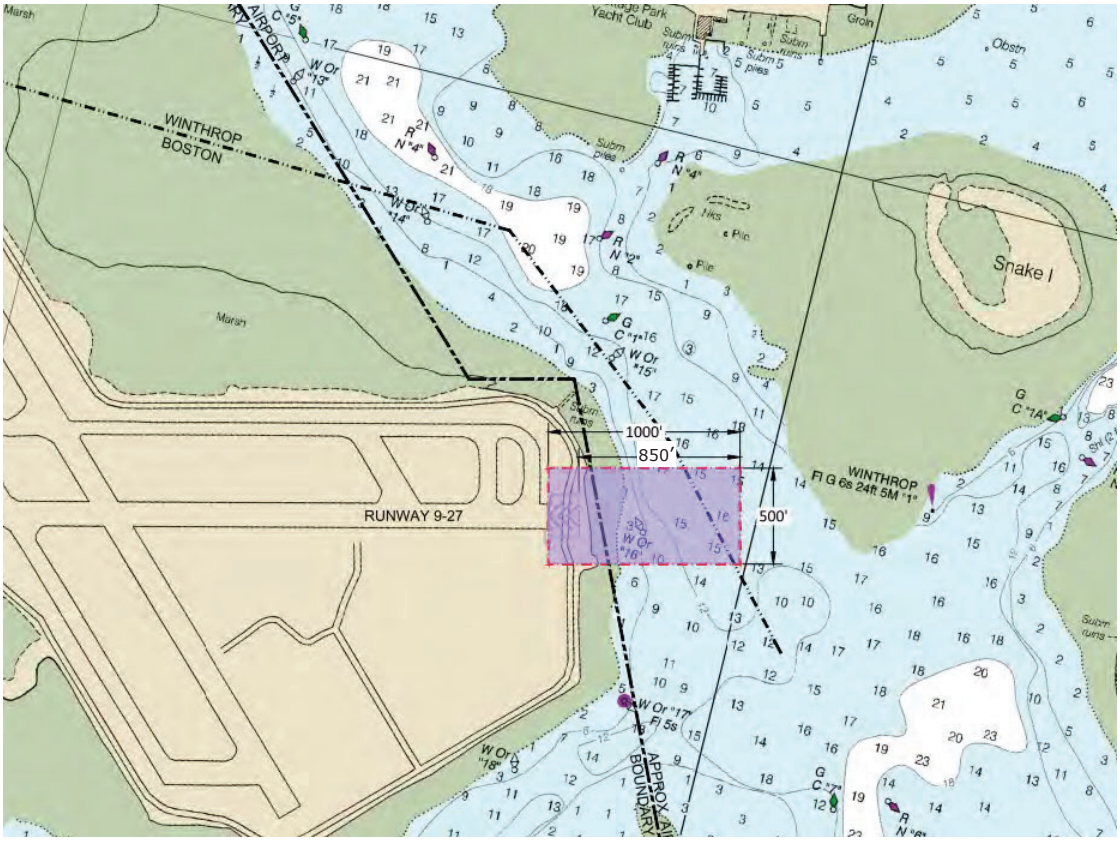
- Very high cost (Alternative 3B is likely more costly than 3A).

- Potential for operational disruption as part of construction due to the need for barges and cranes (Alternative 3B will likely take longer to construct than Alternative 3A)

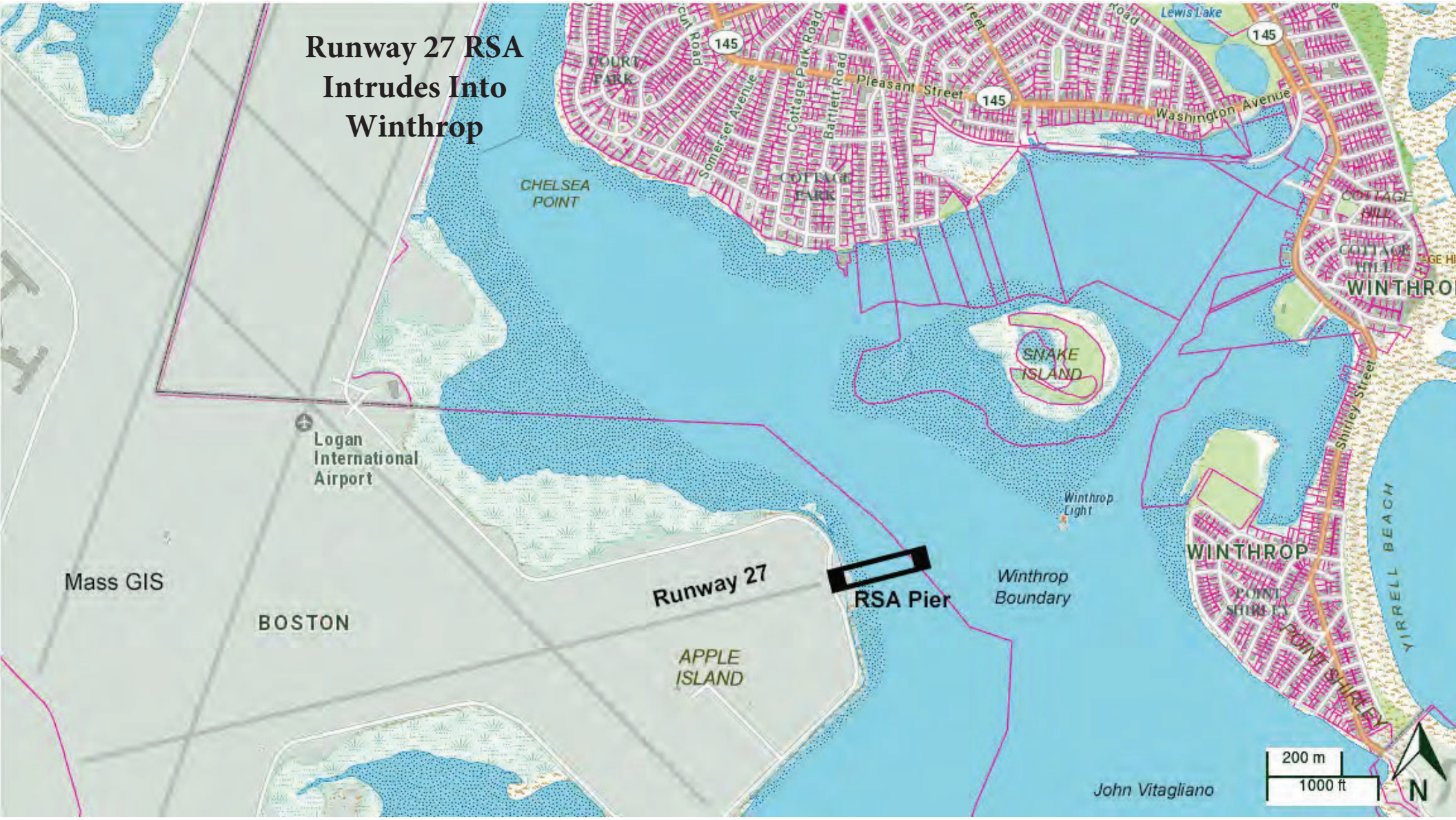
- Both Alternatives would be subject to lengthy community outreach process.

- Both Alternatives would impact portions of the Winthrop navigation channel (shown below) and would likely be unpermittable.

Proposed Full RSA Dimensions Within Ship Channel Vicinity



Source: McFarland Johnson, 2018
NOAA Office of Coast Survey


Runway 27 RSA Intrudes Into Winthrop
CHELSEA POINT
COURT PARK
COTTAGE PARK
Somerset Avenue
Cottage Park Road
Bartlett Road
Pleasant Street
145
Lewis Lake
Washington Avenue
COTTAGE HILL
WINTHRO
SNAKE ISLAND
Shirley Street
Winthrop Light
WINTHROP
POINT SHIRLEY
YIRRELL BEACH
Logan International Airport
Mass GIS
BOSTON
Runway 27
RSA Pier
Winthrop Boundary
APPLE ISLAND
John Vitagliano
200 m
1000 ft
N


Runway 27 Inclined Safety Area (ISA)
JV


Runway 22L-Inclined Safety Area (ISA)
JV


Runway 22R Inclined Safety Area (ISA)
JV

Table H-8 presents a historical summary of runway use by jets. Since 2009, the radar data have been analyzed with Massport's Harris NOMS. Data from 2001 through 2008 were compiled with Massport's PreFlight™ software, an analysis package used to access fleet, day/night splits, and runway use information from radar data. Data prior to 2001 were derived from Massport's original noise monitoring system, supplemented with field records. Note that Logan Airport Noise Rules prevent arrivals to Runway 22R and departures from Runway 4L by jet aircraft except for certain circumstances.

Table H-8 Summary of Jet Aircraft Runway Use – 1990 to 2019

Runway	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
1990										
Departures	0%[2]	3%	21%	N/A	10%	2%	36%	20%	N/A	7%
Arrivals	1%	25%	0%	N/A	2%	14%	0%	28%	N/A	29%
1992[2]										
Departures	0%	6%	31%	N/A	7%	2%	38%	10%	N/A	6%
Arrivals	1%	37%	0%	N/A	3%	12%	0%	30%	N/A	17%
1993										
Departures	0%	9%	33%	N/A	7%	3%	40%	4%	N/A	4%
Arrivals	2%	44%	0%	N/A	1%	11%	0%	28%	N/A	15%
1994										
Departures	0%	9%	33%	N/A	4%	3%	32%	12%	N/A	5%
Arrivals	3%	42%	0%	N/A	1%	8%	0%	27%	N/A	19%
1995										
Departures	0%	8%	36%	N/A	5%	5%	29%	11%	N/A	5%
Arrivals	3%	41%	0%	N/A	2%	8%	0%	27%	N/A	17%
1996										
Departures	0%	8%	32%	N/A	5%	6%	33%	12%	N/A	5%
Arrivals	2%	38%	0%	N/A	2%	11%	0%	29%	N/A	18%
1997										
Departures	0%	8%	30%	N/A	5%	6%	31%	15%	N/A	5%
Arrivals	2%	36%	0%	N/A	2%	9%	0%	30%	N/A	20%
1998										
Departures	0%	8%	35%	N/A	6%	5%	28%	14%	N/A	5%
Arrivals	2%	41%	0%	N/A	2%	7%	0%	28%	N/A	19%
1999										
Departures	0%	8%	31%	N/A	5%	4%	30%	15%	N/A	6%
Arrivals	3%	37%	0%	N/A	2%	10%	0%	28%	N/A	21%
2000										
Departures	0%	8%	35%	N/A	4%	3%	30%	15%	N/A	6%
Arrivals	4%	40%	0%	N/A	1%	7%	0%	28%	N/A	20%

Table H-8 Summary of Jet Aircraft Runway Use – 1990 to 2019 (Continued)

Runway	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
2001										
Departures	0%	7%	34%	N/A	4%	3%	35%	12%	N/A	5%
Arrivals	5%	36%	0%	N/A	1%	8%	0%	32%	N/A	18%
2002										
Departures	0%	4%	31%	N/A	6%	3%	35%	16%	N/A	6%
Arrivals	6%	31%	0%	N/A	1%	12%	0%	30%	N/A	21%
2003										
Departures	0%	4%	33%	N/A	7%	2%	34%	14%	N/A	6%
Arrivals	7%	33%	0%	N/A	1%	14%	0%	28%	N/A	18%
2004										
Departures	0%	5%	34%	N/A	10%	4%	24%	18%	N/A	6%
Arrivals	6%	34%	0%	N/A	1%	12%	0%	24%	N/A	23%
2005										
Departures	0%	5%	36%	N/A	7%	1%	31%	13%	N/A	7%
Arrivals	8%	33%	0%	N/A	1%	11%	0%	29%	N/A	17%
2006										
Departures	0%	4%	33%	0%	3%	1%	40%	13%	0%	6%
Arrivals	7%	29%	0%	0%	1%	14%	0%	33%	0.2%	16%
2007										
Departures	0%	5%	31%	0%	4%	1%	33%	7%	0%	19%
Arrivals	5%	31%	0%	0%	1%	15%	0%	36%	2%	11%
2008										
Departures	0%	6%	33%	<1%	3%	<1%	36%	6%	0%	16%
Arrivals	6%	30%	0%	0%	2%	17%	0%	33%	2%	11%
2009[3]										
Departures	0%	7%	32%	0%	3%	2%	34%	6%	0%	16%
Arrivals	7%	31%	0%	0%	3%	17%	0%	30%	1%	11%
2010										
Departures	0%	4%	28%	<1%	8%	2%	31%	10%	0%	17%
Arrivals	5%	28%	0%	0%	1%	15%	0%	32%	1%	16%
2011[4]										
Departures	0%	6%	36%	<1%	5%	2%	36%	7%	0%	7%
Arrivals	7%	37%	0%	0%	<1%	16%	0%	28%	1%	11%
2012[4]										
Departures	0%	6%	33%	<1%	5%	3%	38%	6%	0%	9%
Arrivals	6%	34%	0%	0%	1%	16%	0%	33%	<1%	9%
2013										
Departures	<1%	5%	30%	<1%	5%	2%	35%	12%	0%	12%
Arrivals	6%	29%	0%	0%	1%	16%	<1%	32%	1%	15%

Table H-8 Summary of Jet Aircraft Runway Use – 1990 to 2019 (Continued)

Runway	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
2014										
Departures	0%	5%	31%	<1%	5%	2%	28%	13%	0%	17%
Arrivals	5%	30%	0%	0%	2%	25%	<1%	21%	1%	16%
2015										
Departures	0%	4%	29%	<1%	5%	2%	32%	12%	0%	15%
Arrivals	5%	29%	0%	0%	2%	25%	<1%	23%	1%	16%
2016[5]										
Departures	0%	4%	30%	0%	6%	2%	27%	13%	0%	18%
Arrivals	4%	31%	0%	0%	1%	24%	<1%	23%	1%	16%
2017[6]										
Departures	0%	2%	25%	0%	5%	1%	28%	15%	0%	23%
Arrivals	5%	21%	0%	0%	5%	23%	<1%	27%	2%	18%
2018										
Departures	<1%	4%	30%	0%	5%	2%	34%	10%	0%	16%
Arrivals	4%	30%	0%	0%	<1%	32%	<1%	21%	1%	12%
2019										
Departures	0%	4%	30%	0%	4%	2%	28%	12%	0%	20%
Arrivals	4%	28%	0%	0%	<1%	29%	<1%	22%	2%	15%

Source: HMMH 2020, Massport Noise Office.

Notes: These data reflect actual percentages of jet aircraft operations on each runway end. They should not be confused with effective runway use, which is used by the Preferential Runway Advisory System (PRAS) to derive recommendations for use of a particular runway. Effective runway percentages include a factor of 10 applied to nighttime operations so that use of a runway at night more closely reflects its effect on total noise exposure.
Jet aircraft are not able to use Runway 15L or 33R due to its length of only 2,557 feet.
Values may not add to 100 percent due to rounding.
N/A - not available.

1 Runway 14-32 opened in late November 2006. (Runway 14-32 is unidirectional with no arrivals to Runway 14 and no departures from Runway 32.)

2 The *1990 Final Generic Environmental Impact Report* was published and submitted to the Secretary of Environmental Affairs in July 1993. It included modeled operations and resulting noise contours for 1987, 1990, and a 1996-forecast year. The *1993 Annual Update* published in July 1994 included operations and contours for 1992 and 1993. 1991 data are not available.

3 Runway 9-27 had extended weekend closings for resurfacing during 2009.

4 Runway 15R-33L was closed for 3 months in 2011 and in 2012.

5 Runway 4L-22Rwas closed for 31 days in 2016.

6 Runway 4R-22L was closed for 35 days in 2017, with limited availability for Runway 4R arrivals for about 80 additional days.

John Vitagliano
19 Seymour Street
Winthrop, MA 02152
617-846-1105

September 28, 2021

The Honorable Kathleen A. Theoharides, Secretary
Tori Kim, Director of MEPA Office
Executive Office of Environmental Affairs (EOEA)
Attn: Erin Flaherty, MEPA Analyst
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: Boston Logan International Airport
Runway 27 End Runway Safety Area Improvements Project, ENF-EEA No. 16433-(The Project)

Addendum to Previous Submitted Comments:

Dear Secretary Theoharides and Director Kim:

I respectfully submit this addendum to previously submitted comments concerning EEA No. 16433:

I question the basic Massport premise of selecting the Logan Airport Runway 27 end for a Runway Safety Area project when there are two other locations-Runways 4R, 4L- that experience similar levels of aircraft operations which would benefit from an RSA with fewer environmental constraints:

- The proposed Runway 27 RSA location experiences an annual total of 61,216 Runway 9 flights which are all departures. Interestingly, there aren't *any* Runway 9 arrivals as indicated by the attached Massport chart indicating 0 Runway 9 approaches for the past 20 years which significantly limits the number of flights that would benefit from a Runway 27 RSA and significantly limits its functionality.
- However, the Runway 4R end experiences an annual total of 65,086 flights, including 22L departures and 4R arrivals, substantially more than the Runway 27 end.
  Yet the Massprt proposal has no provisions for a Runway 4R RSA.
- Also, the Runway 4L end experiences a total of 61,108 annual flights, including 22R departures, nearly equal to the Runway 27 location. Yet the Massport proposal has no provisions for a Runway 4L RSA.

Based on Massport data (Year 2019 operations).

It is important to note that the 4R and 4L runway ends are not equipped with Inclined Safety Areas, so that both runway ends would realize greater incremental safety enhancements from individual RSA's than the Runway 27 end which is currently equipped with a fully functional Inclined Safety Area which provides a significant measure of overshoot protection. Therefore, the Runways 4L and 4R ends would functionally benefit more from RSA projects than the Runway 27 RSA project and would entail significantly fewer environmental conflicts while avoiding any negative impacts on the Town of Winthrop. Therefore, I urge Massport to reassess its RSA priority assignment by replacing the Runway 27 RSA proposal with two alternative RSA's for the Runway 4L and 4R ends which, together, would provide enhanced RSA safety for twice as many annual Logan Airport flights than the single controversial Runway 27 RSA proposal.

I have assumed that RSA's are statistically more beneficial to aircraft overshoots, departures and arrivals, than undershoots.

Thank You,
John Vitagliano

Member: Winthrop Airport Hazards Committee

:attachments

2004 General Location Plan

Legend:

Approximate Massport Property Lines

Index of Prominent Airport Locations

1. Sky Chefs
2. MPA Wood Island Substation
3. MPA Facilities II
4. MPA Facilities III
5. U.S. Airways Hangar
6. MPA Pumping Station
8. Delta Hangar
8A. CNG Fuel Station
9. Northwest Hangar
11. Delta Reservations
13. UPS Cargo
14. Temporary Signature General Aviation Terminal
16. American Hangar
17. Terminal E West Parking Area
18. MPA Facilities I / Heating Plant
19. Terminal E
20. Terminal D
21. Terminal C Pier B
22. Terminal C Main Terminal
23. Terminal C Pier C
24. Terminal C Pier D
25. MPA Administration Building
26. ATC Tower
27. Terminal B Pier A(American)
28. Terminal B Parking Garage
29. Terminal B Pier B(USAirways)
30. Central Parking Garage
31. Terminal A Main Terminal (under renovations)
31A. Terminal A Passenger Tunnel
31B. Terminal A Satellite Terminal
33. Gate Gourmet Flight Kitchen
34. Hilton Hotel
37. MBTA Airport Station
38. Dollar Rent a Car
38A. Dollar Rent a Car
39. Avis Rent a Car
40. Electrical Maintenance Stockroom
41. Porter Street Substation
42. Hertz Rent a Car
45. Taxi Pool
46. BOS Fuel Farm/ Fuel Operations & Control Bldg.
47. MTA Response Station/ Electrical Substation
48. Future Toll Plaza at TWT
49. Budget Rent a Car
50. National Rent a Car
51. B.U. Office Building
53. Fire Dept. Boat House
54. General Aviation Hangar/ Continental Maintenance
55. Amelia Earhart Building Support
56. Northwest Cargo
57. FedEx Cargo
58. American & FedEx Cargo
59. Post Office Staging Area
60. MLR Properties
61. U.S. Postal Facility
62. U.S. Air/ United/ Continental Cargo
63. Cargo Building #63
65. Logan Office Center
66. Field Lighting Vault
67. BIF Electric Substation
68. Sky Chefs
69. Alamo Rent a Car
70. Harborside Hyatt Hotel
73. Terminal E Baggage Screening Building
74. Water Shuttle Pier
76. Limo Pool
77. Fuel Farm
78. Massport Fire-Rescue Headquarters
79. Satellite Fire Station
80. State Police K-9 Facility
81. West Parking Garage
82. Vent Building #7
83. Economy Lot #1
83A. Economy Lot #2
83B. Employee Parking
84. Bird Island Flats Garage
85. Fire-Rescue Boat Dock
86. Citgo Gas Station
87. Terminal E Walkway
88. Terminal A Walkway
89. Terminal C Walkway
90. Terminal B Walkways
91. Central Stockroom
92. Batch Plant and Trailers
93. United GSE Facility
94. United Hangar Support Facility
95. United Hangar

0 450 900 1800
In Feet

Logan International Airport
East Boston, MA

Massachusetts Port Authority
Capital Programs Department
March 2004

JV

Table H-8 presents a historical summary of runway use by jets. Since 2009, the radar data have been analyzed with Massport's Harris NOMS. Data from 2001 through 2008 were compiled with Massport's PreFlight™ software, an analysis package used to access fleet, day/night splits, and runway use information from radar data. Data prior to 2001 were derived from Massport's original noise monitoring system, supplemented with field records. Note that Logan Airport Noise Rules prevent arrivals to Runway 22R and departures from Runway 4L by jet aircraft except for certain circumstances.

Table H-8 Summary of Jet Aircraft Runway Use – 1990 to 2019

Runway	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
1990										
Departures	0%[2]	3%	21%	N/A	10%	2%	36%	20%	N/A	7%
Arrivals	1%	25%	0%	N/A	2%	14%	0%	28%	N/A	29%
1992[2]										
Departures	0%	6%	31%	N/A	7%	2%	38%	10%	N/A	6%
Arrivals	1%	37%	0%	N/A	3%	12%	0%	30%	N/A	17%
1993										
Departures	0%	9%	33%	N/A	7%	3%	40%	4%	N/A	4%
Arrivals	2%	44%	0%	N/A	1%	11%	0%	28%	N/A	15%
1994										
Departures	0%	9%	33%	N/A	4%	3%	32%	12%	N/A	5%
Arrivals	3%	42%	0%	N/A	1%	8%	0%	27%	N/A	19%
1995										
Departures	0%	8%	36%	N/A	5%	5%	29%	11%	N/A	5%
Arrivals	3%	41%	0%	N/A	2%	8%	0%	27%	N/A	17%
1996										
Departures	0%	8%	32%	N/A	5%	6%	33%	12%	N/A	5%
Arrivals	2%	38%	0%	N/A	2%	11%	0%	29%	N/A	18%
1997										
Departures	0%	8%	30%	N/A	5%	6%	31%	15%	N/A	5%
Arrivals	2%	36%	0%	N/A	2%	9%	0%	30%	N/A	20%
1998										
Departures	0%	8%	35%	N/A	6%	5%	28%	14%	N/A	5%
Arrivals	2%	41%	0%	N/A	2%	7%	0%	28%	N/A	19%
1999										
Departures	0%	8%	31%	N/A	5%	4%	30%	15%	N/A	6%
Arrivals	3%	37%	0%	N/A	2%	10%	0%	28%	N/A	21%
2000										
Departures	0%	8%	35%	N/A	4%	3%	30%	15%	N/A	6%
Arrivals	4%	40%	0%	N/A	1%	7%	0%	28%	N/A	20%

Table H-8 Summary of Jet Aircraft Runway Use – 1990 to 2019 (Continued)

Runway	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
2001										
Departures	0%	7%	34%	N/A	4%	3%	35%	12%	N/A	5%
Arrivals	5%	36%	0%	N/A	1%	8%	0%	32%	N/A	18%
2002										
Departures	0%	4%	31%	N/A	6%	3%	35%	16%	N/A	6%
Arrivals	6%	31%	0%	N/A	1%	12%	0%	30%	N/A	21%
2003										
Departures	0%	4%	33%	N/A	7%	2%	34%	14%	N/A	6%
Arrivals	7%	33%	0%	N/A	1%	14%	0%	28%	N/A	18%
2004										
Departures	0%	5%	34%	N/A	10%	4%	24%	18%	N/A	6%
Arrivals	6%	34%	0%	N/A	1%	12%	0%	24%	N/A	23%
2005										
Departures	0%	5%	36%	N/A	7%	1%	31%	13%	N/A	7%
Arrivals	8%	33%	0%	N/A	1%	11%	0%	29%	N/A	17%
2006										
Departures	0%	4%	33%	0%	3%	1%	40%	13%	0%	6%
Arrivals	7%	29%	0%	0%	1%	14%	0%	33%	0.2%	16%
2007										
Departures	0%	5%	31%	0%	4%	1%	33%	7%	0%	19%
Arrivals	5%	31%	0%	0%	1%	15%	0%	36%	2%	11%
2008										
Departures	0%	6%	33%	<1%	3%	<1%	36%	6%	0%	16%
Arrivals	6%	30%	0%	0%	2%	17%	0%	33%	2%	11%
2009[3]										
Departures	0%	7%	32%	0%	3%	2%	34%	6%	0%	16%
Arrivals	7%	31%	0%	0%	3%	17%	0%	30%	1%	11%
2010										
Departures	0%	4%	28%	<1%	8%	2%	31%	10%	0%	17%
Arrivals	5%	28%	0%	0%	1%	15%	0%	32%	1%	16%
2011[4]										
Departures	0%	6%	36%	<1%	5%	2%	36%	7%	0%	7%
Arrivals	7%	37%	0%	0%	<1%	16%	0%	28%	1%	11%
2012[4]										
Departures	0%	6%	33%	<1%	5%	3%	38%	6%	0%	9%
Arrivals	6%	34%	0%	0%	1%	16%	0%	33%	<1%	9%
2013										
Departures	<1%	5%	30%	<1%	5%	2%	35%	12%	0%	12%
Arrivals	6%	29%	0%	0%	1%	16%	<1%	32%	1%	15%

Table H-8 Summary of Jet Aircraft Runway Use – 1990 to 2019 (Continued)

Runway	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
2014										
Departures	0%	5%	31%	<1%	5%	2%	28%	13%	0%	17%
Arrivals	5%	30%	0%	0%	2%	25%	<1%	21%	1%	16%
2015										
Departures	0%	4%	29%	<1%	5%	2%	32%	12%	0%	15%
Arrivals	5%	29%	0%	0%	2%	25%	<1%	23%	1%	16%
2016[5]										
Departures	0%	4%	30%	0%	6%	2%	27%	13%	0%	18%
Arrivals	4%	31%	0%	0%	1%	24%	<1%	23%	1%	16%
2017[6]										
Departures	0%	2%	25%	0%	5%	1%	28%	15%	0%	23%
Arrivals	5%	21%	0%	0%	5%	23%	<1%	27%	2%	18%
2018										
Departures	<1%	4%	30%	0%	5%	2%	34%	10%	0%	16%
Arrivals	4%	30%	0%	0%	<1%	32%	<1%	21%	1%	12%
2019										
Departures	0%	4%	30%	0%	4%	2%	28%	12%	0%	20%
Arrivals	4%	28%	0%	0%	<1%	29%	<1%	22%	2%	15%

Source: HMMH 2020, Massport Noise Office.

Notes: These data reflect actual percentages of jet aircraft operations on each runway end. They should not be confused with effective runway use, which is used by the Preferential Runway Advisory System (PRAS) to derive recommendations for use of a particular runway. Effective runway percentages include a factor of 10 applied to nighttime operations so that use of a runway at night more closely reflects its effect on total noise exposure.
Jet aircraft are not able to use Runway 15L or 33R due to its length of only 2,557 feet.
Values may not add to 100 percent due to rounding.
N/A - not available.

1 Runway 14-32 opened in late November 2006. (Runway 14-32 is unidirectional with no arrivals to Runway 14 and no departures from Runway 32.)

2 The *1990 Final Generic Environmental Impact Report* was published and submitted to the Secretary of Environmental Affairs in July 1993. It included modeled operations and resulting noise contours for 1987, 1990, and a 1996-forecast year. The *1993 Annual Update* published in July 1994 included operations and contours for 1992 and 1993. 1991 data are not available.

3 Runway 9-27 had extended weekend closings for resurfacing during 2009.

4 Runway 15R-33L was closed for 3 months in 2011 and in 2012.

5 Runway 4L-22Rwas closed for 31 days in 2016.

6 Runway 4R-22L was closed for 35 days in 2017, with limited availability for Runway 4R arrivals for about 80 additional days.

BILL SCHMIDT
32 Buchanan Street
Winthrop, MA 02152

Bethany A. Card, Secretary, EOEA
Jennifer Hughes, MEPA Office
100 Cambridge Street
Boston, MA 02114

EEA#16433
Boston Logan International Airport
Runway 27 End Runway Safety Area Improvements Project

Dear Secretary Card:

Thank you for the opportunity to comment on the recently filed Draft Environmental Impact Report (DEIR) for the Boston Logan International Airport Runway 27 End Safety Area Improvements Project.

The DEIR outlines "minimal, but direct impacts to coastal resources, habitat, and plants…" as well as "temporary, minor increases in noise, emissions of air pollutants, water quality effects … and surface traffic". All of these impacts are routine issues that Winthrop encounters due to its proximity to Logan. The DEIR confirms that this project will exacerbate the detrimental impacts to the Winthrop community's quality of life due to our proximity to the airport.

Since the boundaries of the construction site lie within Boston property and merely abut Winthrop, and Snake Island is anticipated to experience minimal impacts, little can be done for the community as it directly relates to the physical boundaries of this project.

Massport needs to look broadly at its environmental impact on Winthrop and commit to making a good faith effort to mitigate the negative effects of Logan Airport operations on our community.

Massport should address two key impacts to Winthrop – air quality issues, via air quality monitoring and noise levels, via expediting the already agreed upon re-soundproofing efforts. 8-1

<u>Air Quality</u>

Due to the frequency of flights arriving and departing from runways 4, 22, 9, and 27 and the known emissions including VOCs, Oxides of Nitrogen, and particulates, it is obvious that the air quality in Winthrop is subpar at best.

Massport needs to do more to combat the intense public health impact from our proximity to Logan. Additional air quality sensors and testing for the town of Winthrop are essential, most importantly in the Point Shirley and Court Road neighborhoods where particulate matter can be physically seen on homes, and the air quality is most at risk. A study was conducted in conjunction with Olin University and Air, Inc. several years ago, but an updated assessment of our current air quality is needed. 8-2

Sound Insulation

The noise levels caused by airport operations are not simply a nuisance to Winthrop residents, but a serious environmental and health concern. A 2020 Boston University Community Sound Lab analysis showed that between 7pm and 7 am, noise levels reached above 65 dBA – loud enough to disrupt sleep - 5 minutes per hour, or 9.1% of the night.

Massport Sound Contours regularly include areas of Winthrop within the 65 DNL range (often referred to as an 'uninhabitable' noise level), with some areas over 70 DNL.

It has been noted that only one of Massport's 30 noise monitors located in various cities and towns surrounding the airport (the monitor located on Point Shirley) recorded DNL that exceeded modeled estimates. The conclusion was that modeled DNL levels and sound contours are conservative estimates of noise. This discrepancy indicates that Winthrop's noise levels are more than what is expected through mathematical calculations, further supporting the idea that our community deserves noise mitigation.

These facts are not shocking, but Massport's sluggish response to the FAA's willingness to fund re-soundproofing efforts for homes initially treated before 1993, is. Community members have asked over the past two years to expedite the process to no avail.

Thank you for your consideration of my comments on these important matters.

Sincerely,

Bill Schmidt
Chair
Winthrop Board of Health

(via electronic mail):
Gail Miller
232 Orient Avenue
East Boston, MA 02128
(617) 970-2474 gailmiller48@icloud.com

August 22, 2022

The Honorable Secretary Bethany A. Card,
Secretary Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900,
Boston, Massachusetts 02114

Re: Massport Boston Logan International Airport Runway 27 End Runway Safety Area Improvements Project Draft Environmental Impact Report EEA #16433

EEA Analysts assigned
Erin.flaherty@mass.gov

EEA Comment portal
https://eeaonline.eea.state.ma.us/EEA/PublicComment/Landing/

Dear Secretary Card,
Airport Impact Relief, Incorporated (AIR, Inc.) thanks you for the opportunity to comment on the Massport Runway 27 RSA Improvement Draft EIR. AIR, Inc. is a community volunteer non-profit 501C-3 which works to achieve environmental justice (EJ) goals. As part of our efforts, AIR, Inc. supports Logan Airport project MEPA review processes by organizing monthly meetings, analyzing Massport's filings in consultation with our members and experts, conducting community engagement to assure public participation, and providing comments which represent community perspectives.

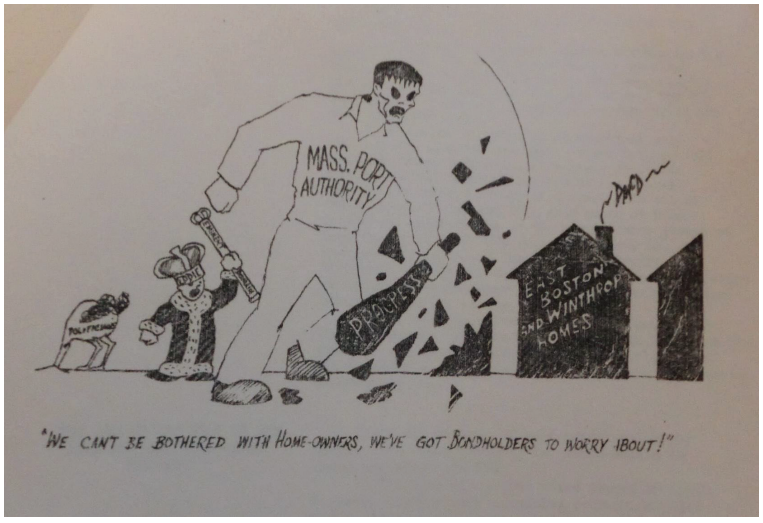
Environmental Justice communities in East Boston, Winthrop and Revere shoulder the most severe noise, traffic and air quality impacts, but also face the most strenuous challenges in participating in technical aviation decision making processes. Lower educational attainment levels, coupled often with low literacy, and family schedules stretched thin by multiple jobs are serious challenges to engagement, especially in fields such as aviation with long and complex technical histories. State law and policy now require that the MEPA Office assess impacts to an environmental justice population located within five miles of an environmental justice population

9-1

and consider whether the project results in an equitable distribution of environmental benefits and environmental burdens. An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy (Roadmap Law) requires the Secretary to find whether the assessment shows existing unfair or inequitable environmental burdens and related public health consequences. Additionally, the Roadmap Law requires the Proponent to identify any adverse short-term and long-term environmental and public health consequences that cannot be avoided and reasonable alternatives to the proposed project. Massport has not met these requirements.

9-1

Most recently, AIR, Inc. has participated in MEPA's regulatory rule making review, led by Assistant Secretary and MEPA Director Kim, to assist MEPA in reaching compliance with the Climate Roadmap law's EJ requirements. Through this process, we have voiced concern that ENFs, EENFs, and other advanced notice concepts proposed do not address critical airport planning and regulatory failures, as such enhanced communications do not incorporate community input at the alternatives analysis stage of project development and therefore do not preclude the advancement of unnecessarily environmentally damaging project concepts.



Political cartoon ca 1970 portraying the Port Authority as a destructive monster

The Runway 27 RSA DEIR exemplifies this problem and continues the trend of biased planning guided by airport growth and capacity ambitions. Operating under a tacit strategy which sees no option but growth, Massport has over the past 60 years consumed three harbor islands, 1,500 acres of harbor, an 83 acre Olmsted park, two urban neighborhoods, hundreds of acres of prime Boston real estate, and hundreds of homes and businesses to satisfy the needs of commercial air carriers. The possibility of protection of the environment in this project was dead on arrival: eliminated in the alternatives selection phase by an agency which regards its future capacity as the only important element worth protecting.

We ask the Secretary to note that Massport's recent environmental filings have been widely criticized for significant forecasting inaccuracies, and that the former Secretary has found the agency's mitigation planning to be insufficient, requiring further planning processes which the Port Authority has refused to implement. We ask that the Secretary recognize that the failures

and deficiencies highlighted in the following comments are not isolated complaints, but part of a pattern and long history of underperformance in environmental planning and reporting which regards the future of Logan above that of our planet.

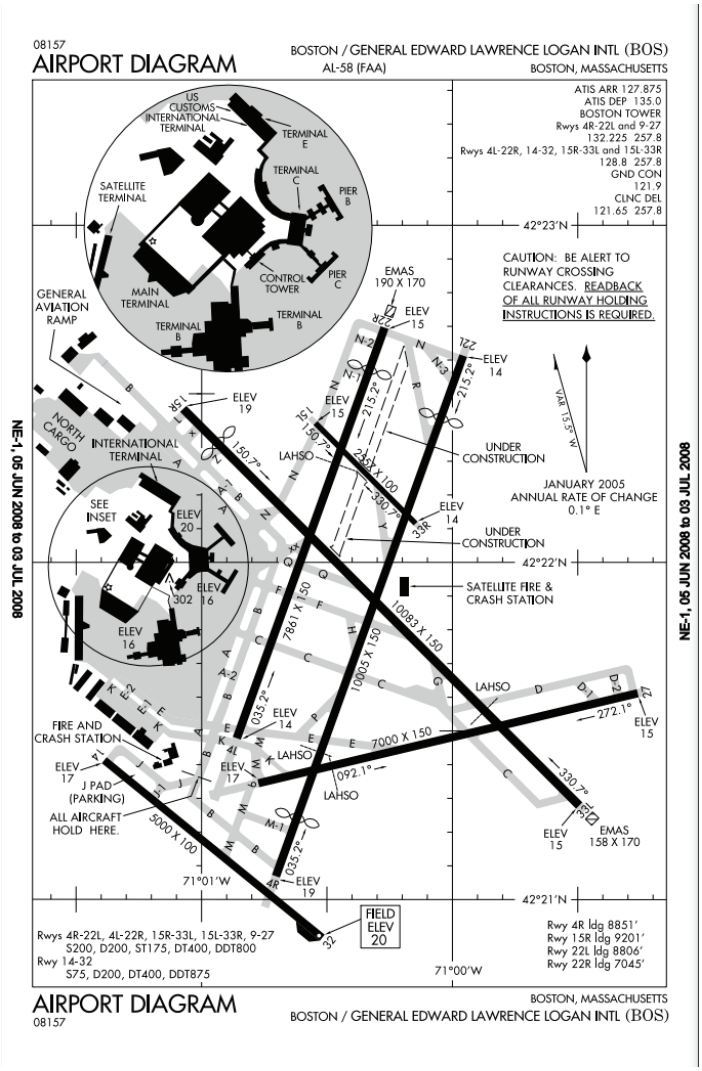
The EMAS at the east end of Runway 33L

The Runway 27 RSA DEIR's use of negative 'takeoff limitations and airfield operational impacts' as criteria for eliminating the environmentally safest alternative follows a pattern. In 2010, Massport used the same operational efficiency and capacity argument in its Draft EA / EIR (EOEA #14442) to rule out environmentally preferential options including declaring usable distances and shifting threshold alternatives. We ask the Secretary to note that at 10,000', Runway 33L is a full 3,000' longer than Runway 27 and that the operable factor here is that Massport is simply unwilling to entertain any form of present or potential future infringement on Logan's airfield capacity. The fact is that Logan has not even approached its present airfield capacity. The Secretary should require Massport to substantiate its claims of operational and capacity detriment by quantifying current airfield capacity, and potential loss of capacity, while also providing context regarding Logan's maximum capacity, and the percentage of that capacity which has been used.

9-2

Massport has chosen to locate New Englans's largest airport in Boston's urban core, on an available landmass which is clearly too limited to suit Logan's current uses. Aviation is a highly regulated industry which creates innumerable challenges and limitations which Massport must accept in their choice of airport location. Due to wind and weather considerations, Massport

must provide runway configurations which are acceptable for use in both prevailing winter northwest and summer south wind conditions. These dual wind conditions create further limitations, adding complexity to the airfield operations, and when combined with the lack of available airfield space, also creating the need for development of convergences where runways intersect. FAA regulations on converging runways state that an aircraft cannot begin its takeoff roll until any aircraft on an intersecting runway has passed the point of convergence. This creates operational capacity limitations when using Runway 15R for landings and Runway 27 for takeoffs. Massport has responded by designating Runway 33L as a primary departure runway (affecting runway use increases over EJ communities which are specifically forbidden in FAA Record of Decision, August 2, 2004), and using Runway 27 for arrivals, allowing for landing aircraft to more quickly pass the point of convergence. This choice confirms the Port Authority's pattern of choosing airport capacity over reduction of impacts in EJ communities.



The added complexity of managing air traffic at Logan posed by the need for converging runways is compounded by the physical limitations of Logan's available land. Runway 27's court injuncted 7001' maximum length limits Massport's ability to serve larger, heavier classes of aircraft AND meet FAA's current RSA design standards without causing environmental impacts to the harbor if Massport refuses to consider either displacing the runway thresholds or declaring a shorter usable runway distance. This conundrum is part of the overall management challenge facing Massport which is triggered by their ambitions to continue to operate a large airport at capacities which are over the airfield's practical limits.

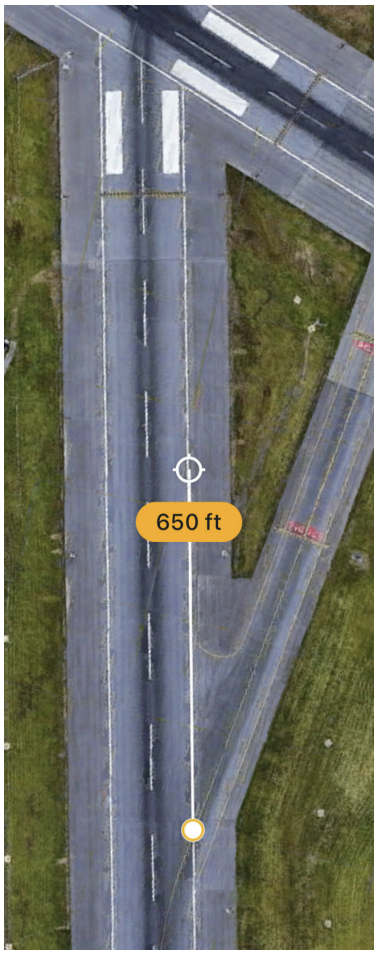
The only solution available to Massport to this problem is not to deny the inherent limitations, or to infringe on the environment. Massport has good alternatives which will allow them to comply fully with the FAA requirements. The fact is that each of the environmentally preferential alternatives will create modest operational impacts which are known, which are commonplace, and which

can be dealt with easily. This challenge is not unique. Laguardia and Washington National also have short runways and deal with weight limitations and available runway length.

Massport has provided only qualitative criteria to support its selection of Alternative 4B. The Secretary should require that Massport quantify the impacts and effects which it claims will result from all viable alternative RSA designs. 9-3

Massport also promotes alternative 4B as the FAA's preferred alternative. We hope the Secretary will note that the FAA is not responsible for selecting RSA alternatives; it is Massport, as the airport sponsor, which has authority and responsibility for RSA design selection. It is inappropriate for Massport to attempt to borrow legitimacy, or deflect ownership of this matter onto a federal agency. It is Massport's responsibility to evaluate RSA alternatives and select a design. We ask the Secretary to request a clarification from Massport regarding FAA's role in the design selection. 9-4

Although the Draft EIR provides 618 pages of information, discussion of Alternative 1, the declared distances option is limited to 4 paragraphs which refer readers to a separate study in the documents appendix. The Roadmap Law requires full alternatives assessment, including reasonable alternatives to the proposed project and their environmental and public health consequences (M.G.L. c. 30, section 62B). The discussion provided in the DEIR fails to provide such an assessment, ambiguously stating that "certain aircraft" of classes which comprise 80% of operations on Runway 27, are anticipated to need to reduce their takeoff weight to comply with maximum operating takeoff weight requirements. Exactly which aircraft and what percentage of operations on the runway will be affected? Massport does not provide this data. The Secretary should require Massport to support its assertions with data. Specifically, we would like Massport to identify the aircraft, and provide data on the percentage of takeoffs which may be affected. Massport should also provide analysis of the inefficiency claimed in terms of operations per hour lost in runway use configurations which include takeoffs on 27. 9-5



The DEIR states that shortening 27 would reduce the distance between threshold and the exit to Taxiway E, resulting in undisclosed increases in runway occupancy time, equally undisclosed decreases in arrival capacity on Runway 27, and also undisclosed operational impacts to Runway 22L departure capacity. The Secretary should require Massport to quantify the existing number of aircraft which bypass Taxiway E or request arrival on 33L and enumerate the number and frequency of the claimed impacts. The DEIR fails to address whether the entrance to Taxiway E can be reconfigured and shifted to the west or to the south to avoid the loss of distance noted as a problem. The provided Google Earth image indicates that there is 9-6

the entrance to Taxiway E could be shifted 650' westward. Alternatively, the Taxiway could exit to the left. We ask the Secretary require Massport to evaluate the option of reconfiguring Taxiway E and or making other airfield alterations to facilitate capacity needs with a shortened runway.

9-6

World Airlines flight 30H

The DEIR incorrectly states, commencing with the letter of transmittal, that the preferred alternative would improve safety and "improve rescue access in the event of an emergency". By proposing a pseudo RSA on an elevated deck above the waters of Boston Harbor, the preferred alternative ignores the FAA requirements for lateral grade limitations for RSA's. These requirements are established to enhance aircraft structural integrity during a veer-off accident and to permit rapid rescue access to wreckage. The US aviation industry has experienced multiple veer-off accidents where timely access by rescue personnel has been inhibited by lateral barriers. Delta Airlines flight 1086 veered off the runway at LaGuardia airport during a show storm in March 2015, coming to rest hanging over the perimeter of a similar deck. Continental Airlines flight 795 veered off into a ditch at Denver in 1994 with serious implications for timely rescue access to the crash site. In fact, the World Airlines crash of Airways flight 30H in Boston on January 23, 1982 also involved a lateral deviation of the airplane into the frigid waters of Boston harbor. Luckily World 30H was not on a narrow deck suspended 20 feet above mean low water as is being proposed in this preferred alternative. The cause of improved safety at BOS runway 27 would be greatly enhanced if the FAA lateral safety grade requirements were required. The Secretary should require the FEIR to substantively address this issue.

9-7

The transmittal letter and the DEIR are similarly deficient when they say “there are no feasible alternatives that both meet FAA safety requirements and avoid marine resource impacts.” The selection of alternatives notably failed to include an alternative that has been discussed since the original extensions of runways 09/27 and 22L/04R were constructed in the 1960’s: the relocation of both thresholds of runway 09/27 further to the West.
The preferred alternative features an addition of approximately 650 feet beyond the existing 150 foot RSA and the inclusion of an Engineered Materials Arresting System to comply with current FAA RSA requirements. There is no reason why a displacement of both runway 09/27 thresholds 650 feet to the west would not meet those FAA requirements. Although Runway 27 is limited by a court injunction to a maximum of 7000’, 8,000’ of paved runway was constructed. Displacing the runway thresholds 650’ to the west would allow for exactly the same RSA solution on the eastern end of the runway as the preferred alternative without impacting wetlands or creating adverse safety risks from a narrow, elevated deck.

9-8

The DEIR and the ENF both disparage this solution on several specious grounds. First is the false assertion that the existing injunctions on the location of the thresholds of the relevant runways would be difficult to obtain and would involve extensive federal involvement, including approval by the Secretary of Transportation. None of this is true. The injunction being referred to is a Massachusetts state court injunction that was partially lifted with respect to the construction of runway 14/32 (also enjoined under the same court order). That court proceeding took mere weeks to file and obtain relief, and was supported with a brief filed by AIR, Inc. There is no truth to the false assertions that the injunction is a substantial impediment to revising the status of the runway threshold. We ask that the Secretary specifically require Massport to address the actual history of this issue, with court citations, in the FEIR.

9-9

The second basis for opposition is that the relocation of thresholds to the west would cause significant operational disruption at the airport. This issue needs more detailed treatment than the superficial discussion in the DEIR provides. According to FAA requirements, aircraft departing on runway 27 toward the Boston skyline need to be able to either climb over buildings that present obstructions or turn to avoid such obstructions in their departure path. Moving the start of the takeoff roll closer to those obstructions will affect this requirement. But, for perspective: a 737-400 departure to New York, Washington, Chicago, or Charlotte (where the majority of them go) will not have any restrictions. The 737-800 departure to Seattle on a hot day when lift is reduced, may have a restriction. But, that hypothetical airplane may currently experience a restriction, and can request the much longer runway 33L for departure with little or no operational penalty.

9-10

One of the most disturbing observations of the DEIR is that Massport is referencing FAA studies that they claim will provide information on this set of problems. However, FAA cites Boeing and Airbus Airport Planning documents as its sources for the runway performance characteristics of airplanes. Boeing and Airbus specifically state that these documents are only intended to provide guidance on general airport characteristics, <u>not specific flight operations</u>. These are documents that are intended to help airport planners develop long-term plans for where to locate airports and how long their runways should be for the general class of airplane that might

9-11

use them. The section of FAA that actually decides what the requirements are for obstruction clearance are completely separate from the Office of Airports, who provided this input based on inadequate Airbus and Boeing publications. Only after a runway's geometry is confirmed will the FAA tell air carriers what their obstacle clearance requirements are. We request that the Secretary require Massport to specifically address this issue in consultation with the FAA Office of Flight Standards or other responsible FAA official who will make the relevant decisions on operational requirements for obstruction evaluation in this case. In the event that operational requirements for clearing obstructions should be an issue under one or more environmentally preferential alternative RSA designs, the Secretary should require Massport to list the various procedural and operational implications in detail in a comprehensive manner.

9-11

Finally, FAA notes that the availability of EMAS is contingent on the resolution of a lawsuit involving FAA and the two competing manufacturers of FAA approved EMAS-like systems. We ask the Secretary to make any approval of this DEIR contingent upon the successful resolution of this litigation.

9-12

Table ES-1 Tier 1 Alternatives Screening Results

	Alternative						
Screening Criteria	**1 Declared Distances[1]**	**2 Displaced Thresholds**	**3A Full RSA, Fill**	**3B Full RSA, Deck**	**4A EMAS[2] on 500' Deck**	**4B EMAS[2] on 306' Deck**	**No-Build**
Provide overrun and undershoot protection for aircraft consistent with the FAA design criteria	●	●	●	●	●	●	●
Preserve airfield utility and efficiency	●	●	●	●	●	●	●
Retain perimeter road	●	●	●	●	●	●	●
Avoid triggering runway injunction requirements	●	●	●	●	●	●	●
Avoid impacts to the navigation channel	●	●	●	●	●	●	●
Avoid and minimize environmental impacts	●	●	●	●	●	●	●

Key:

● Green indicates that the criterion is met and/or that no negative effect is anticipated; the alternative is favorable in comparison to the other alternatives.

● Orange indicates that the criterion is partially met and/or that there is some negative effect anticipated.

● Red indicates that the criterion is not met and/or that a negative effect is anticipated; the alternative is not favorable in comparison to the other alternatives.

1 Although RSA Alternative 1 scored positively against several screening criteria, it would adversely affect airfield operations and pose takeoff limitations.

2 An Engineered Materials Arresting System (EMAS) is a bed of energy-absorbing material. In an emergency, if an aircraft rolls into an EMAS, the aircraft is slowed down in a way that minimizes damage to the aircraft and potential injuries to passengers and crew members.

Figure 1 Massport Screening Results Table (Source: Massport DEIR)

The DEIR's Table ES-1 provides a graphic representation of Massport's flawed decision making, very explicitly representing their preference to inflict what they consider to be small negative environmental impacts in order to avoid undisclosed operational costs. Within this graphic, Massport classifies the shading of 137,700 square feet (3.2 acres) more shellfish habitat and driving of 326 twenty-inch more square concrete piles as 'partially avoiding and minimizing environmental impacts'.

9-13

Residents of East Boston and Winthrop, who have experienced Logan expansion, view the destruction of additional public marine resources proposed in the Runway 27 RSA proposal

much differently: as a continuation of Massport's persistent environmental destruction over its 60 year history. Residents of this area have borne witness to destruction on an unimaginable scale: including the obliteration of an 83 acre Olmsted park, leveling of three harbor islands including the ruins of historic Fort Winthrop, and over 1,500 acres of marine habitat to create Logan's runways. Local residents do not so easily accept the conclusion that another few acres loss is reasonable and can be mitigated with fees paid to the Department of Wildlife and Fisheries, as is proposed by Massport. Nor do environmental activists and long time stewards of the local salt marshes so readily accept Massport's conclusions that another 3.2 acres of destruction will not result in significant impacts. Community stakeholders see their natural environment as part of a complex ecological system which exists in a delicate balance that has been pushed to a tipping point and can withstand no further infringement.

9-13

The DEIR describes the airport's two tiered security perimeter as a 500' outer perimeter, and a 250' inner zone. In addition to the damage the pile supported EMAS structure is likely to cause to the ecology, Massport also reported in the DEIR that they plan to move the markers which denote these security zones. This will amount to a loss of public use of the watersheet in an already busy navigation environment.

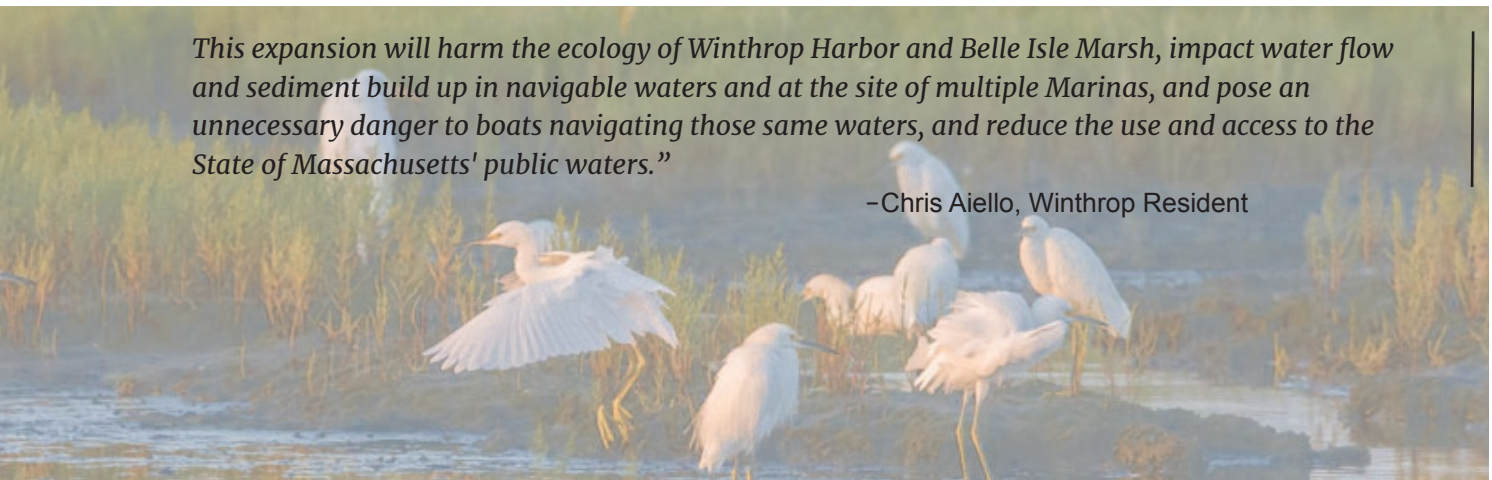
Long time community environmental organizations Friends of Belle Isle Marsh are alarmed at the potential negative impacts the proposed pile-supported structure will have on the Belle Isle and Wood Island salt marshes and estuaries. Consulted on this matter, the group noted that marshes need unobstructed tidal flow to allow ocean-produced organic materials to nourish the salt marsh soils and help them grow in depth, and; that processes such as this are vital given the climate change related sea level rise. They believe this project will affect the long range health of the marshes. They also believe the piling operations and shading will degrade the existing clam, muscle and oyster beds which are natural barriers to storm surge, and impede the health of the marine life that inhabit the nearby marshes. Winthrop community leader Chris Aiello's comments succinctly the widely held community perspective:

"Massport's history of expansion has already done irreparable harm to the Town of Winthrop and neighboring East Boston by destroying parks and wetlands, and filling our community with pollution and noise. Massport should not be allowed to expand its footprint under the guise of complying with safety regulations. Instead Massport should adjust the use of its runway in a manner that would allow it to comply with safety requirements. The airport is meant to serve the people and economy of Massachusetts, and it seems that Massport at times forgets its purpose. The burden here should be on Massport, not the surrounding communities. If modern safety standards mean that a runway cannot be used for the same type or frequency of aircraft that quite simply should be a Massport problem.

This expansion will harm the ecology of Winthrop Harbor and Belle Isle Marsh, impact water flow and sediment build up in navigable waters and at the site of multiple Marinas, and pose an unnecessary danger to boats navigating those same waters, and reduce the use and access to the State of Massachusetts' public waters."

–Chris Aiello, Winthrop Resident

9-14



In conclusion, Massport, as owner and operator of New England's largest commercial airport, must operate under numerous FAA constraints and limitations. They expend tremendous resources to find solutions to these constraints and fuel their perpetual growth ambitions. However, Port Authority planners view environmental constraints and limitations as elective, or peripheral issues. Massport's unfortunate decision to select design alternative 4b, a modified engineered materials arresting system (EMAS) was made, in a self-enforced planning vacuum, without early community input, and without quantitative evaluation of public benefits and environmental costs. In isolation Massport has reached the conclusion that negative environmental and community impacts are preferable to undisclosed operational costs. 9-15

In designing a Runway Safety Area for Runway 27, Massport has a number of alternatives, some of which completely satisfy the FAA's RSA requirements and also have no environmental impacts. Massport hasn't seriously considered these options citing only vague operational disadvantages. In selecting the over harbor EMAS option, Massport is choosing environmental damage and infringement on public use of water resources over administrative hassle.

AIR, Inc. encourages the Secretary to find Massport's preferred alternative to be inappropriate given the existence of no cost, 100% satisfactory environmentally beneficial alternatives. We ask that the Secretary require Massport to reopen their alternatives selection process to include community input and provide responses to the many data and planning deficiencies highlighted above. 9-16

Thank you for the opportunity to provide comment on this important project.

Sincerely,

Gail C. Miller

Gail Miller
President, Airport Impact Relief, Incorporated (AIR, Inc.)

Chris Marchi
Vice President, Airport Impact Relief, Incorporated (AIR, Inc.)

Letter 10

Hughes, Jennifer (EEA)

From: Margaret Roberts <rmargaret120@outlook.com>
Sent: Wednesday, August 10, 2022 12:20 PM
To: Hughes, Jennifer (EEA)
Subject: Runway 27 end Runway Safety Area Improvement Project (EEA 16433) Draft EIR

Ms. Hughes,
I am e-mailing to object to the above Runway 27 project. I reside in the Point Shirley section of Winthrop. My home is located very near the harbor and directly under the flight path of Runway 9 at Logan. My home faces west and is a few streets from Coughlin Park. Planes approach Runway 27 directly over the park. Coughlin Park includes a basketball court, a tennis court, and a children's playground. Frequently when planes arrive over the park during west winds, the odor of jet fuel is overwhelming. The noise in the surrounding neighborhood is also very loud with each arriving and departing plane. Despite this Massport has so far done nothing to address the impact of the increased noise and pollution suffered by our community. Massport is basing sound mitigation on airport activity generated in 2020, the height of the pandemic, when airport activity was greatly reduced.
Now Massport wants to further impact the harbor. At the recent meeting held on Zoom, we were told that the new RSA does not extend into Winthrop Harbor. It will be very close to our harbor and will consist of 326 concrete piles and have a 867 sq. ft. footprint. As I stated in a previous e-mail, our harbor is narrow, and consists of 3 marinas, 5 yacht clubs, an Elks club with boats, the Winthrop Public Landing (home to the Winthrop Ferry), 3 public beaches, the bird sanctuary at Snake Island. I am concerned this will have both permanent, and temporary negative results for the shared harbor and surrounding community. The Point Shirley area as well as other parts of Winthrop are already at risk for flooding. As sea levels rise I fear this project, along with increased airline activity will do nothing but increase our vulnerability in the face of the dangers of climate change. 10-1
Thank you for your attention to my concerns,
Margaret Roberts
10 Billows St.
Winthrop, MA 02152

Sent from Mail for Windows

This Page Intentionally Left Blank

Comment Letters

ID #	Commenter	Comment	Response
1.1	MassDEP Boston Waterways Regulation Program	The Department requests the Final EIR include the following additional information related to Chapter 91 and the state harbor line to confirm the project is consistent with the pertinent statute(s): 1. Confirmation there are no further modifications to the state harbor line in this location subsequent to the 1966 Act. 2. The location of the state harbor line be added to all project plans and exhibits related to Chapter 91 in the Final EIR and the eventual Waterways License Application. Documentation suitable to demonstrate that the project complies with Chapter 733 of the Acts of 1966 and any subsequent statute to the extent applicable.	A License plan illustrating the revised State Harbor Lines and the Acts and Resolves of the General Court of Massachusetts from 1966 that describes the harbor lines was provided to Massport by MassDEP. This information was used to establish and illustrate the harbor lines on the Final EIR Project figures. At the Runway 27 End, the State Harbor Line is roughly coincident with the toe of the existing embankment of the airfield and have been added to the Project plans. See Draft EA/Final EIR Figure 3-1 (pg. 3-8), Figure 3-2 (pg. 3-14), and Figure 3-3 (pg. 3-19). The proposed RSA deck will extend approximately 460 feet beyond the established State Harbor Line. Massport's enabling legislation for the establishment of Logan Airport allows necessary airport facilities to extend beyond the State Harbor Lines, without legislative approval. The project will, however, require amendment of the existing Chapter 91 License for previous safety improvements.

ID #	Commenter	Comment	Response
2.1	MassDEP-NERO	While MassDEP concurs that a TOY will mitigate for some construction related impact, a demonstration is still needed that performance standards will be met for each Resource Area and appropriate mitigation provided to address permanent impacts. Relocating shellfish should be addressed as an alternative (310 CMR 10.34(6)).	Massport has committed to implementing the necessary construction phase mitigation and where applicable, mitigation for permanent impacts to wetlands and associated natural resources. The next project phase will involve the individual filings with federal, state, and local permitting agencies, including MassDEP. Several of those measures will require a level of detail beyond that required for the MEPA or NEPA process. Section 5.2 of the DEIR provides a summary of how the Project addresses performance standards for WPA coastal resource areas. A preliminary summary of the compliance with the Stormwater Management Standards has been provided in Section 3.14 of the Draft EA/Final EIR (pg. 3-53). A more detailed analysis of the stormwater management measures and regulatory compliance will be provided in the permit applications once the final project design is completed. Relocation of shellfish was discussed with the DMF and they determined due to the low numbers of shellfish present in the Project Area it would be more productive for Massport to contribute to the DMF shellfish restoration program. Impacts to coastal resource areas, mitigation, and compliance with performance standards will be provided in permit applications during the permitting phase of the Project. The Boston Conservation Commission, MassDEP, DMF, and NHESP will receive copies of the WPA permit application and will have opportunity to review the Project and to provide additional comments.

2.2	MassDEP-NERO	The DEIR asserts that the project will not require a variance and that the deck construction over the affected Resource Areas will meet the Performance standards for work in those Resource Areas. MassDEP does not concur based on the information provided in the Draft EIR. For example, no demonstration has been made that the Project as proposed will comply with Stormwater Management requirements specified at 310 CMR 10.05(6)(k)1, 2, and 3. The DEIR proposes no new stormwater management structures for a deck adding more than 3.5 acres of impervious area to the airport.	Stormwater management for the proposed RSA deck and the impervious surface created by the associated perimeter road improvements will be designed as part of the project's final design; it will be collected, treated, and discharged in compliance with the applicable Massachusetts Stormwater Management Standards and approved during permitting. Refer to C.5 above for how the project complies with each of the Stormwater Management standards. The total area of Coastal Beach impacted by the two proposed emergency access/egress ramps is estimated to be 490 square feet (approximately 510 square feet total of Coastal Beach would be directly impacted by the RSA deck piles and the two emergency access ramps). The Coastal Beach was identified as consisting of both a rocky surface and a small area of muddy sand. The hard surface of the ramps although different than the existing rocky surface will still be a hard bottom surface. Only 490 square feet of the egress ramps will extend into the soft bottom (mud flat) of the Coastal Beach (refer to Figure 3-3 [pg. 3-19], "Coastal Resources Located within the Project Site" and Table 3-4 [pg. 3 17] of Chapter 3, *Affected Environment and Environmental Consequences*). The Performance Standards for Coastal Beach require no adverse impact by "*increasing erosion, decreasing the volume, or changing the form of any such coastal beach or an adjacent or downdrift coastal beach."* This does not by definition necessarily require mitigation, provided there is no adverse impact. The proposed ramps within the Coastal Beach will be a low profile (similar in grade) and will extend only approximately 10 feet into the Beach. The small area of impact will not cause erosion and will not change the landform (such as a jetty) or interfere with the downdrift of sediment along the shoreline. The access ramps are therefore not anticipated to have an adverse impact to Coastal Beach. However, MassDEP has requested mitigation be provided for the small area of impact to Land Under Ocean and Coastal Beach from the proposed deck piles. Approximately 710 square feet of Land Under the Ocean and Coastal Beach (that is mud flat) will be impacted by the placement of 252 piles. The additional 490 square feet of impacted Coastal Beach mud flat will be added to a proposed mitigation area. Approximately 1,200 square feet of mitigation area will be provided to replace the mud flat and Land Under Ocean lost from the pile installations and egress ramps. Details of the proposed mitigation will be provided as part of the Project WPA permitting effort. The mitigation would be expected to include some form of shoreline restoration in Boston Harbor or Chelsea Creek or could involve mud flat creation like Massport conducted to offset impacts associated with the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. Compliance with the Massachusetts WPA performance standards was provided in DEIR Section 5.2 (pg. 5-5).

ID #	Commenter	Comment	Response
2.3	MassDEP-NERO	The increase to turbidity to resource areas from uncontrolled release of stormwater generated by the proposed RSA does not appear to have been addressed in the Draft EIR. Stormwater control measures need to be proposed to provide water quality treatment and reduce the velocity of the runoff to demonstrate compliance with 310 CMR 10.05(6)(k)1-10.	Massport has committed to not conduct any in-water construction activities from February 15 to June 30 of any year. When in-water construction does occur, outside the time-of-year restriction, turbidity curtains will be installed around the work area to contain and limit the extent of any turbidity created by the construction activities.

ID #	Commenter	Comment	Response
2.4	MassDEP-NERO	The direct impacts to mudflat consist of 280 square feet for pilings and 490 square feet of fill for the emergency egress ramps. 485 square feet of Coastal Beach would be altered and converted to hard bottom by the emergency egress ramps. No mitigation is offered even for the so-called direct impacts.	The total area of Coastal Beach impacted by the two proposed emergency access/egress ramps is estimated to be 490 square feet (approximately 510 square feet total of Coastal Beach would be directly impacted by the RSA deck piles and the two emergency access ramps). The Coastal Beach was identified as consisting of both a rocky surface and a small area of muddy sand. The hard surface of the ramps although different than the existing rocky surface will still be a hard bottom surface. Only 490 square feet of the egress ramps will extend into the soft bottom (mud flat) of the Coastal Beach (refer to Figure 3-3 [pg. 3-19] and Table 3-4 [pg. 3-17] of Chapter 3, *Affected Environment and Environmental Consequences*). The Performance Standards for Coastal Beach require no adverse impact by "*increasing erosion, decreasing the volume, or changing the form of any such coastal beach or an adjacent or downdrift coastal beach."* This does not by definition necessarily require mitigation, provided there is no adverse impact. The proposed ramps within the Coastal Beach will be a low profile (similar in grade) and will extend only approximately 10 feet into the Beach. The small area of impact will not cause erosion and will not change the landform (such as a jetty) or interfere with the downdrift of sediment along the shoreline. The access ramps are therefore not anticipated to have an adverse impact to Coastal Beach. However, MassDEP has requested mitigation be provided for the small area of impact to Land Under Ocean and Coastal Beach from the proposed deck piles. Approximately 710 square feet of Land Under the Ocean and Coastal Beach (that is mud flat) will be impacted by the placement of 252 piles. The additional 490 square feet of impacted Coastal Beach mud flat will be included in the proposed mitigation area. Approximately 1,200 square feet of mitigation area will be provided to replace the mud flat and Land Under Ocean lost from the pile installations and egress ramps. Details of the proposed mitigation will be provided as part of the Project WPA permitting effort. The mitigation would be expected to include some form of shoreline restoration in Boston Harbor or Chelsea Creek or could involve mud flat creation like Massport conducted to offset impacts associated with the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. Compliance with the Massachusetts WPA performance standards was provided in DEIR Section 5.2 (pg. 5-5).
2.5	MassDEP-NERO	Will a pier be required by FAA to house a lighting structure at Runway End 27 RSA, similar to Runway End 33L? If so, an evaluation of resource impacts, alternatives, and potential mitigation measures to offset impacts should be conducted in the Final EIR.	The Runway 33L End features a runway approach lighting system on a pile-supported pier that extends beyond the end of the RSA deck into Boston Harbor. The Runway 27 End does not have a runway approach lighting system and therefore no light pier is proposed beyond the RSA deck. See Section 3.13.2.1 (pg. 3-51) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences.*

ID #	Commenter	Comment	Response
3.1	Massachusetts DMF	As noted in the DEIR, we recommend the proponent continue to coordinate with DMF and other resource agencies to develop a detailed mitigation plan for permanent impacts to shellfish and mud flat habitat. We recommend that a record of this coordination be included in 'Appendix C: Agency Correspondence' of the FEIR.	Massport has and will continue to coordinate with Massachusetts DMF through the MEPA process and follow-on permitting. A record of this coordination is contained in Appendix C, *Agency Correspondence,* of this Draft EA/Final EIR.
3.2	Massachusetts DMF	We are satisfied that the proponent has coordinated with DMF to present the project plans and environmental impacts to the group of Logan licensed badged shellfishers. We concur that badged shellfishers be allowed access to the site following construction. We recommend that a record of this coordination be included in 'Appendix C: Agency Correspondence' of the FEIR.	Massport has and will continue to coordinate with Massachusetts DMF through the MEPA process and follow-on permitting. A record of this coordination is contained in Appendix C, *Agency Correspondence,* of this Draft EA/Final EIR.
3.3	Massachusetts DMF	We concur with the proponent's plan to adhere to the recommended time of year (TOY) restriction for in-water silt-producing work, e.g., pile installation, from February 15 to June 30 to minimize impact to winter flounder and the use of turbidity curtains to contain turbidity associated with in water silt-producing work occurring outside of the recommend TOY to minimize impacts to spawning and early life history stages of shellfish species in the vicinity of the project.	These conditions will be included in the construction specifications and have been described in Section 3.4.5 (pg. 3-21) of Chapter 3, *Affected Environment and Environmental Consequences,* and Chapter 4, *Proposed Mitigation and Draft Section 61 Findings.*

ID #	Commenter	Comment	Response
4.1	NHESP	At this time, it is not clear whether the Enhancements to the Runway Safety Area will or will not result in a Take (321 CMR 10.18(2)(b)) of state-listed species. The Proponent should identify all permanent and temporary impacts to grassland habitat along with any proposed removal of existing excess pavement and grassland restoration area. The Proponent should specify whether the anticipated timeline for the commencement of construction related noise will occur during the tern nesting season (May – July). The Proponent should continue to consult the Division as the project design progresses. The Division anticipates working with the Proponent to resolve concerns for state-listed species and their habitats associated with the Project through the MESA review process (321 CMR 10.18, 10.23).	Grassland habitat will be impacted by the proposed relocation of the airfield perimeter roadway and a small area of additional new pavement at the end of the Runway 27 to widen the pavement to 300 feet. Relocation of the roadway and conversion of grassland outside of the new roadway and runway shoulder paving will reduce grassland habitat within the NHESP polygon by approximately 20,300 square feet. An additional 22,000 square feet of grassland would be temporarily altered during construction. In addition to coordination during the ENF and DEIR preparation, Massport has discussed next steps with NHESP as part of Draft EA/Final EIR preparation. Consistent with the Division comments on the DEIR, Section 3.4.3 (pg. 3-15) of Draft EA/ Final EIR Chapter 3, *Affected Environment and Environmental Consequences,* presents information of expected temporary and permanent project impacts. Additional details will not be known until design advances. Massport will continue to work with NHESP as the project design progresses. To the extent that permanent impacts are identified, Massport expects to work with NHESP to identify opportunities at Logan Airport to restore areas of unused pavement to grassland to ensure no net loss of habitat that would constitute a "Take" and the need for a Conservation Management Plan. Temporarily altered grassland will be restored in place with a seed mix approved by NHESP.

ID #	Commenter	Comment	Response
5.1	Massport Community Advisory Committee	Due to the impacts of the project on the intertidal area, as well as the potential vulnerability to sea level rise, it would be appropriate to provide support for other projects or initiatives that would mitigate the effects of climate change when this project is built.	Comment noted. Massport has a range of resiliency programs in place to reduce risk associated with climate change-related impacts. In 2022, Massport published its *Roadmap to Net Zero by 2031*, which is aimed at reducing GHG emissions from Logan Airport and other Massport facilities. As described in Section 3.5.3.2. (pg. 3-24) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, Adaptation and Resiliency, Massport developed and adopted a set of design guidelines in 2014 for flood resiliency as part of the *Massport Floodproofing Design Guide*. The *Massport Floodproofing Design Guide* is incorporated into capital planning and real estate development processes to make Massport infrastructure and operations more resilient to flooding.[1] The *Massport Floodproofing Design Guide* established design flood elevations for future flood scenarios that are potentially more stringent than those required by current building codes. The Massachusetts Coastal Flood Risk Model is used to assess potential flooding vulnerabilities for Massport projects along the coastline. In 2020, Massport performed a safety rehabilitation of Runway 9-27 to enhance the surface of the runway. As part of that effort, and with the knowledge that some type of improvement to the Runway 27 End RSA would be upcoming, the runway threshold was raised 10 inches from its existing elevation. The 10-inch adjustment was made to account for any potential safety area construction extending out into Boston Harbor and sea level rise. The raise in elevation was made to the maximum extent practicable in relation to the remainder of the airfield. FAA has set criteria and requirements in relation to grade change. The raise in elevation results in a deck which would be higher than the Runway 4R light pier and Runway 33L End RSA deck. In 2018, Massport published the Sustainability and Resiliency Design Standards and Guidelines (SRDSG) as minimum standards for all new construction and rehabilitation projects, to meet the sustainability goals set forth in the Logan Airport 2015 Sustainability Management Plan (SMP). The SMP guides Massport's sustainability practices at Logan Airport and provides a framework for Massport-wide initiatives to support its commitment to sustainability. Requirements and best practices described in the SRDSGs would be implemented where possible. As specified in the SRDSGs, this includes commitments to reduce the consumption of virgin material, purchase sustainable or environmentally preferable construction materials, reduce energy and water consumption during construction, and incorporate best practices in waste handling, storage, and disposal.

ID #	Commenter	Comment	Response
6.1	Winthrop Town Council	Because the boundaries of the construction site within Boston property and merely abut Winthrop, and Snake Island is anticipated to experience minimal impacts, little can be done for the community as it directly relates to the physical boundaries of this project. However, by taking a global view of the environmental impacts Logan Airport has on the Town of Winthrop, we believe there is an opportunity for environmental mitigation overall... Broad environmental mitigation should be deployed as a means of mitigating the additional environmental impacts on Winthrop from the RSA Improvement project.	While the project is near the Town of Winthrop (as shown on Figure 3-1 [pg. 3-8] of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*), all proposed construction is within the City of Boston. The proposed RSA improvements will occur near an active navigation channel that provides public boating access to Belle Isle Inlet and other areas of Winthrop and East Boston. Although near the channel, the proposed RSA deck will be approximately 175 feet away from the edge of the channel. During construction, most of the equipment and materials will be brought to the Project Site by barge or other water borne transport. These vessels may occupy portions of the navigation channel intermittently but will not preclude use of the channel by the public. As the RSA deck is constructed, a maneuvering barge may periodically enter the navigation channel. The maneuvering barge may temporarily restrict a portion of the channel, but public use will not be completely restricted. The modeling studies presented in the DEIR demonstrate that the project would have no adverse impacts on the adjacent navigation channel or Snake Island.
6.2	Winthrop Town Council	We believe that the Winthrop Conservation Committee should be consulted during the planning and permitting process for this project. While the RSA pilings and pier will be on Boston property it clearly abuts Winthrop's property, and thus our marine, tidal, and coastal ecosystems.	Massport agrees. Massport previously held a discussion with the Town of Winthrop Conservation Administrator regarding the Project. As in the past, Massport also offered to make a project presentation to the Winthrop Conservation Commission; the scheduled meeting needed to be postponed by the Commission and Massport remains willing to meet with the Commission at their earliest convenience.

1 Massachusetts Port Authority, *Massport Floodproofing Design Guide*, November 2014, revised November 2018, https://www.massport.com/media/2xacmacm/massport-floodproofing-design-guide-revised-november-2018.pdf.

ID #	Commenter	Comment	Response
7.1	John Vitagliano (Member Winthrop Air Hazards Committee)	The Project clearly intrudes on the boundary of the Town of Winthrop, as indicated by the series of charts (including Massport documents) entitled "Winthrop Incursion", yet the Project fails to acknowledge this critical aspect. The DEIR states that the Project will impact 574,500 sf of filled tidelands on the site, including 117,300 sf of land containing shellfish, which as indicated on the charts, clearly lie within Winthrop's boundaries and therefore should be required to be reviewed and approved by Winthrop's Conservation Commission and other appropriate Town agencies and regulatory bodies including the Town Council. The Project would also impact the Winthrop navigation channel which provides maritime access to three yacht clubs in Winthrop and two in East Boston, and the Winthrop Landing which services the Winthrop Ferry service.	As was clarified in the DEIR, while the Project is near the Town of Winthrop (as shown on Figure 3-1 (pg. 3-8) Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*), proposed construction is within the City of Boston. Massport has included the Winthrop Town Manager, Town Council, and the Conservation Commission in distribution of the ENF, DEIR, and this Draft EA/Final EIR (refer to Appendix G, *Distribution List*). In addition, Massport has been in direct contact with the Town's Conservation Administrator to discuss the project. A presentation to the Conservation Commission by Massport and the project team was scheduled but postponed by the Commission. Massport remains willing to meet with the Commission at their earliest convenience. The modeling studies presented in the DEIR demonstrate that the project would have no adverse impacts on the adjacent navigation channel or Snake Island.
8.1	Bill Schmidt (Chair Winthrop Board of Health)	Massport should address two key impacts to Winthrop - air quality issues, via air quality monitoring and noise levels, via expediting the already agreed upon re-soundproofing efforts.	The RSA extension will not change the operational use of the runway and therefore not impact noise/air emissions related to aircraft operations. Massport is implementing the latest phase of the Residential Soundproofing program consistent with FAA requirements. Massport also continues to work with FAA and academic institutions on research to analyze and inform air emissions related to aircraft operations. This effort includes using Logan Airport as a test area for emissions monitoring based on research requirements.

ID #	Commenter	Comment	Response
8.2	Bill Schmidt (Chair Winthrop Board of Health)	Massport needs to do more to combat the intense public health impact from our proximity to Logan. Additional air quality sensors and testing for the Town of Winthrop are essential, most importantly in the Point Shirley and Court Road neighborhoods where particulate matter can be physically seen on homes, and the air quality is most at risk. A study was conducted in conjunction with Olin University and Air, Inc. several years ago, but an updated assessment of our current air quality is needed.	The environmental impacts of this project are related to construction only. The RSA extension will not change the operational use of the runway and therefore no impact on noise/air emissions related to aircraft operations. In 2022, Massport published its *Roadmap to Net Zero by 2031*, which is aimed at reducing GHG emissions from Logan Airport and other Massport facilities. A key focus of *Roadmap* is Logan Airport and opportunities to reduce emissions from Massport, tenant and business partner facilities and operations. The implementation phase of the net zero initiative is now underway which will be tracking and reporting on both ongoing and upcoming GHG reduction initiatives. Additional information on the *Roadmap to Net Zero by 2031* can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.
9.1	AIR, Inc.	Environmental Justice communities in East Boston, Winthrop, and Revere shoulder the most severe noise, traffic, and air quality impacts. State law and policy now require that the MEPA Office assess impacts to an environmental justice population located within five miles and consider whether the project results in an equitable distribution of environmental benefits and environmental burdens. An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy (Roadmap Law) requires the Secretary to find whether the assessment shows existing unfair or inequitable environmental burdens and related public health consequences. Additionally, the Roadmap Law requires the Proponent to identify any adverse short-term and long-term environmental and public health consequences that cannot be avoided and reasonable alternatives to the proposed project. Massport has not met these requirements.	In accordance with the new MEPA requirements for projects within 1 mile of an EJ community, Massport held a virtual pre-ENF filing public meeting on June 29, 2021, after reaching out to local and state elected officials, representatives in East Boston and Winthrop, the MCAC, and community interest groups. Massport has held 4 public meetings on the project to date, including meeting streamed both in English and Spanish. The ENF, DEIR and FEIR all fully address both temporary construction-phase and permanent project impacts and outline mitigation strategies that will be refined as permitting and design proceeds. Massport recognizes the importance of a robust outreach approach to ensure the public is aware of these reports and has an opportunity to review and comment. The following measures have been implemented for this filing: • Post a social media announcement notifying the public of upcoming filing. • Circulate the Draft EA/Final EIR electronically to the EJ Reference List provided by MEPA • Translate the Notice of Availability into Spanish. • Translate the Executive Summary into Spanish. • Post Draft EA/Final EIR on Massport's website at the time of filing with MEPA, allowing for approximately an additional week of review time. The updated EJ outreach plan that Massport intends to follow is provided in Appendix E.5, *Updated Environmental Justice Outreach Plan*.

ID #	Commenter	Comment	Response
9.2	AIR, Inc.	The Secretary should require Massport to substantiate its claims of operational and capacity detriment by quantifying current airfield capacity, and potential loss of capacity, while also providing context regarding Logan's maximum capacity, and the percentage of that capacity which has been used.	Two alternatives identified in the Runway Incursion Mitigation (RIM) Study for Runway 9-27 do not include physical construction of an enhanced RSA (see Appendix B, *RIM Study*). Each of which would adversely impact the airfield's safety, capacity, and efficiency. • **Declared Distances** (changing the pavement markings on the runway which would move the Runway 27 landing threshold 450 feet to the west. This would reduce the usable Runway 27 arrival length by 450 feet and the usable Runway 9 arrival length by 850 feet (refer to Figure 2-3 [pg. 2-7] in Chapter 2, *Proposed Action and Alternatives*). Section 2.3.1.2 (pg. 2-13) of Chapter 2 describes how not only would this option reduce the ability of Runway 9-27 in accommodating approximately 75% of aircraft typically using that runway but would also result in those aircraft having to take weight penalties. The southwest corner of Logan Airport's airfield is a complicated geometry layout with intersecting runways, intersecting runways safety areas and several major taxiways. The area includes a designated "Hot Spot" by FAA and Massport. This designation is provided to aircraft pilots as a means to be even more vigilant when transiting through the area. Over the years Massport, working closely with FAA air traffic controllers, airline pilots, and aviation experts, have implemented measures to reduce the probability of pilot confusion including installation of runways status lights, enhanced markings, and signage, and designating the area by Runway 4L and Taxiways E and K as a "Hot Spot." Any shifting or relocating of runways (or taxiways) in this area will complicate a complex area even further and reduce safety. • **Displaced thresholds** are typically used to give arriving aircraft adequate clearance over an obstruction while still allowing departing aircraft the maximum amount of runway available for takeoffs. RSA Alternative 2 would shift the Runway 9 threshold to the west by 195 feet to maintain the full 7,001 feet of existing runway length for arrivals and departures on Runway 9-27 (refer to Figure 2-4 [pg. 2-8] in Chapter 2, *Proposed Action and Alternatives*). This would be accomplished by restriping a segment of existing Taxiway M pavement immediately west of the existing Runway 9 End. This alternative would decrease the existing RSA length deficiency from 850 feet to 655 feet, increasing the RSA length only marginally and would not result in the Runway 27 End meeting FAA's design requirements.

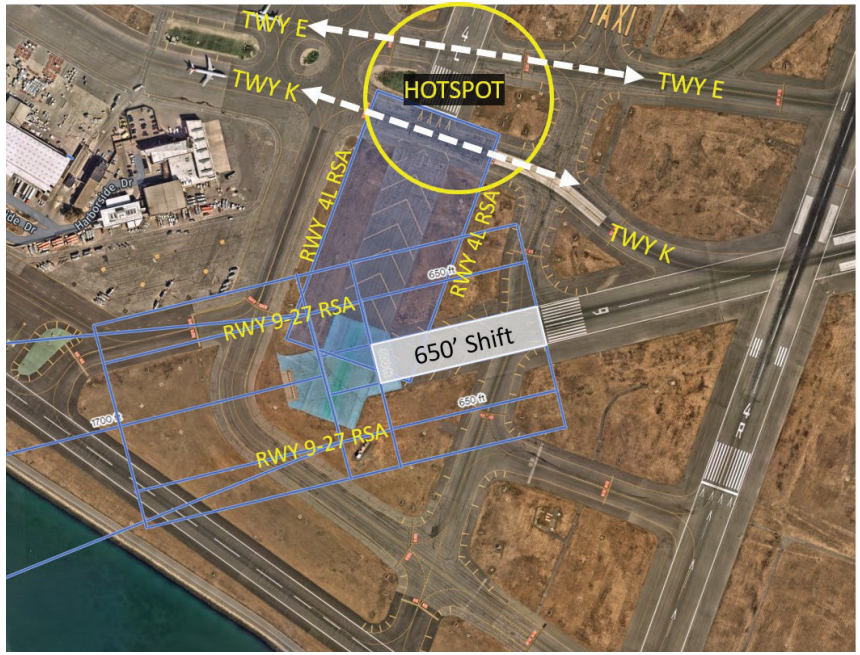
ID #	Commenter	Comment	Response
9.3	AIR, Inc.	Massport has provided only qualitative criteria to support its selection of Alternative 4B. The Secretary should require that Massport quantify the impacts and effects which it claims will result from all viable alternative RSA designs.	In DEIR Chapter 3, *Alternatives Considered*, Massport presented and analyzed detailed alternatives to support selection of Alternative 4B. Of note is DEIR Table 3-3 (pg. 3-18), which summarizes the screening criteria and the various benefits and downsides of each alternative. The full, detailed RSA alternatives analysis conducted by Massport in coordination with FAA is included as attachments to both the ENF and DEIR, and included in this document as well as Appendix B, *RIM Study*. Based on the findings of the RIM Study (see Appendix B, *RIM Study*), FAA determined that the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of Alternative 4B – EMAS on 300-Foot-Wide Deck (the actual width of the deck would be 306 feet to allow for safety rails). This determination by FAA set the stage for Massport to develop the deck foundation support options in Tier 2 analysis.
9.4	AIR, Inc.	Massport also promotes alternative 4B as the FAA's preferred alternative. We hope the Secretary will note that the FAA is not responsible for selecting RSA alternatives; it is Massport, as the airport sponsor, which has authority and responsibility for RSA design selection. We ask the Secretary to request a clarification from Massport regarding FAA's role in the design selection.	This is an aviation safety project, and FAA are the federal aviation experts. As such, FAA carefully reviewed the full range of alternatives that were described in the ENF and DEIR. Based on the findings of the RIM Study (see Draft EA/Final EIR Appendix B, *RIM Study*), FAA determined that the existing runway can be improved to enhance safety, and goes on to state that it reviewed the alternatives study to address the RSA deviations from design standards, and that the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of Alternative 4B – EMAS on 300-Foot-Wide Deck (the actual width of the deck would be 306 feet to allow for safety rails). This determination by FAA set the stage for Massport to develop the deck foundation support options in Tier 2 analysis. FAA will need to approve the runway design and construction, since a portion of the project will be funded with FAA resources.

<table>
<tr><th>ID #</th><th>Commenter</th><th>Comment</th><th>Response</th></tr>
<tr><td>9.5</td><td>AIR, Inc.</td><td>Although the Draft EIR provides 618 pages of information, discussion of Alternative 1, the declared distances option is limited to 4 paragraphs which refer readers to a separate study in the document's appendix. The Roadmap Law requires full alternatives assessment, including reasonable alternatives to the proposed project and their environmental and public health consequences (M.G.L. c. 30, section 62B). The discussion provided in the DEIR fails to provide such an assessment, ambiguously stating that "certain aircraft" of classes which comprise 80% of operations on Runway 27, are anticipated to need to reduce their takeoff weight to comply with maximum operating takeoff weight requirements. Specifically, we would like Massport to identify the aircraft, and provide data on the percentage of takeoffs which may be affected. Massport should also provide analysis of the inefficiency claimed in terms of operations per hour lost in runway use configurations which include takeoffs on 27.</td><td>The ENF fully outlined the RSA alternatives considered and included, as an attachment, the full analysis that was submitted to FAA for its RSA determination. The ENF Certificate accepted that alternative for further consideration in the DEIR. The DEIR summarized the ENF and incorporated that by reference. In addition, this Draft EA/Final EIR includes an alternatives analysis of different deck support structures and identifies a preferred alternative that meets the critical safety Purpose and Need while minimizing environmental impacts (refer to Chapter 2, Proposed Action and Alternatives). The following table from the alternatives analysis (Appendix B, RIM Study; also included as Table 2-3 [pg. 2-14] in Chapter 2) summarizes the specific aircraft that would be affected by changes in usable runway length.

Table 1.5 Maximum Payloads - 6,150' Runway 9 Length
<table>
<tr><th>Aircraft and Engine Type</th><th>Maximum Takeoff Weight (MTOW)</th><th>Standard Day MTOW</th><th>Standard Day + 15C MTOW</th></tr>
<tr><td>Airbus (20% of R/W 9 Takeoff Operations)</td><td></td><td></td><td></td></tr>
<tr><td>A321 - IAE V2500</td><td>206,132 lbs.</td><td>185,000 lbs.</td><td>182,500 lbs.</td></tr>
<tr><td>A321 - CFM56</td><td>206,132 lbs.</td><td>185,000 lbs.</td><td>182,000 lbs.</td></tr>
<tr><td>A320 – IAE V2500</td><td>174,165 lbs.</td><td>162,000 lbs.</td><td>160,500 lbs.</td></tr>
<tr><td>A320 – CFM56</td><td>174,165 lbs.</td><td>164,500 lbs.</td><td>160,000 lbs.</td></tr>
<tr><td>Boeing (15% of R/W 9 Takeoff Operations)</td><td></td><td></td><td></td></tr>
<tr><td>737-700 – CFM56, 20K Thrust</td><td>154,500 lbs.</td><td>139,500 lbs.</td><td>136,000 lbs.</td></tr>
<tr><td>737-700 – CFM56, 26K Thrust</td><td>154,500 lbs.</td><td>No Penalty</td><td>No Penalty</td></tr>
<tr><td>737-800 – CFM56, 26K Thrust</td><td>174,200 lbs.</td><td>157,000 lbs.</td><td>154,000 lbs.</td></tr>
<tr><td>737-900 – CFM56, 24K Thrust</td><td>174,200 lbs.</td><td>146,500 lbs.</td><td>142,500 lbs.</td></tr>
<tr><td>737-900ER – CFM56, 26K Thrust</td><td>187,700 lbs.</td><td>156,000 lbs.</td><td>152,500 lbs.</td></tr>
</table>
Source: Boeing 737 Aircraft Planning Characteristics for Airport Planning Manual; Airbus A321 Aircraft Characteristics Airport and Maintenance Planning; Airbus A320 Aircraft Characteristics Airport and Maintenance Planning; Kimley Horn Analysis.</td></tr>
</table>

ID #	Commenter	Comment	Response
9.6	AIR, Inc.	The Secretary should require Massport to quantify the existing number of aircraft which bypass Taxiway E or request arrival on 33L and enumerate the number and frequency of the claimed impacts. The DEIR fails to address whether the entrance to Taxiway E can be reconfigured and shifted to the west or to the south to avoid the loss of distance noted as a problem. We ask the Secretary require Massport to evaluate the option of reconfiguring Taxiway E and or making other airfield alterations to facilitate capacity needs with a shortened runway.	Reconfiguring or moving the Taxiway E entrance to accommodate displacing the Runway 27 Threshold is not feasible because it does not provide adequate queueing space for Land and Hold Short Operations (LAHSO) for aircraft that exit the runway and need to stop at the LAHSO hold bar on Taxiway E to allow for Runway 22L departures. This will make Taxiway E unusable and have the following adverse effects • Potentially result in aircraft entering Taxiway E at a higher speed which could increase the potential for an inadvertent crossing of the Runway 4R-22L hold bar or Land and Hold Short Operations (LAHSO) bar and possible excursions. • Resulting in more aircraft crossing Runway 4R-22L to access either Taxiways M or K. • Potential to increase runway occupancy times and decrease arrival capacity on Runway 27 due to loss of Taxiway E viability. • Aircraft not exiting at Taxiway E would likely be directed to exit at either Taxiways M or Taxiway K, potentially increasing landing roll out times and operational delay. • Loss of Taxiway E utility could trigger shifting most arriving aircraft to taxi to Taxiway K, potentially causing congestion in the vicinity of Taxiways K and M if aircraft are in queue to hold for crossing Runway 4L-22R on Taxiway K. It could also result in aircraft having to go-around for Runway 27 arrivals if the queue backs up beyond the Runway 27 hold bar. Shortening runways and reducing airfield capacity will reduce safety, reduce operational efficiency, and potentially shift flights from Runway 9-27 to Runway 33L and therefore is not a feasible option for airports, airlines, or air traffic control and will likely result in shifting noise.

ID #	Commenter	Comment	Response
9.7	AIR, Inc.	The DEIR incorrectly states, commencing with the letter of transmittal, that the preferred alternative would improve safety and "improve rescue access in the event of an emergency". By proposing a pseudo RSA on an elevated deck above the waters of Boston Harbor, the preferred alternative ignores the FAA requirements for lateral grade limitations for RSA's. The cause of improved safety at BOS runway 27 would be greatly enhanced if the FAA lateral safety grade requirements were required. The Secretary should require the FEIR to substantively address this issue.	FAA has determined that Alternative 4B meets its federal runway safety standards. Construction of the RSA will also need to meet FAA design standards. Refer to FAA's Runway Determination dated January 23, 2019, where it was stated "This alternative is preferred as it will provide the highest level of aircraft safety without reducing the operational capability of the Logan Airport airfield while also minimizing environmental impacts from additional construction in the harbor" (refer to Appendix B, *RIM Study*). A safety feature added to the project includes an exit ramp on either side of the RSA deck to facilitate exiting the water in the event of an emergency.

9.8	AIR, Inc.	The transmittal letter and the DEIR are similarly deficient when they say "there are no feasible alternatives that both meet FAA safety requirements and avoid marine resource impacts." The selection of alternatives notably failed to include an alternative that has been discussed since the original extensions of Runways 9/27 and 22L/04R were constructed in the 1960's: the relocation of both thresholds of runway 09/27 further to the West. Displacing the runway thresholds 650' to the west would allow for exactly the same RSA solution on the eastern end of the runway as the preferred alternative without impacting wetlands or creating adverse safety risks from a narrow, elevated deck.	The southwest corner of the Logan Airport airfield has a complicated geometry layout with intersecting runways, RSAs, and several major taxiways. Over the years, Massport working closely with FAA air traffic controllers, airline pilots, and aviation experts have implemented measures to reduce the probability of pilot confusion by installing runway status lights, enhanced pavement markings and signage, and designating the intersections of Runway 4L and Taxiways E and K as a "Hot Spot." This designation is provided to aircraft pilots as a means to be even more vigilant when transiting through the area. Any shifting or relocating of runways (or taxiways) in this area to accommodate shifting of Runway 9-27 to the west would complicate a complex area even further and impact safety.  Because Runway 9-27 is used in conjunction with Runways 4L-22R and 4R-22L during northeast and southwest wind configurations, shifting the runway to the southwest will converge the Runway 9 threshold with the Runway 4L RSA and Runway Object Free Area (ROFA) and create another hotspot just south of the existing hotspot. FAA prohibits runways from starting within the RSA of another runway. This geometry will increase the likelihood of runway incursions (an unintended entry of an aircraft on an active runway)

ID #	Commenter	Comment	Response
			by: • Creating additional taxiway crossings of an active runway • Adding to pilot confusion • Eliminating the ability to Line up and Wait (LUAW) outside of the Runway 4L-22R RSA • Increasing ATC staff workload This will negatively impact Northeast and Southwest flow capacities, which constitute approximately 60% of the airport's operating flows in the summer months. In addition, shifting both thresholds of Runway 9-27 to the southwest will result in major operational impacts to the airport reducing safety, efficiency, and capacity. This shift will increase penetrations of existing obstacles to FAA's United States Standards for Terminal Instrument Procedures (TERPS) surfaces and airlines' critically important One Engine Out (OEI) surface. These penetrations would reduce the availability of aircraft to use Runway 27 for departures and increase the likelihood for pilots requesting Runway 33L for departures in Northwest Flow, thus, increasing flights over East Boston and communities to the West. The reason for this is as follows: • A 650' shift to the west would result in a new non-standard climb gradient of at least 515 ft/nm. The climb gradient could be even higher if another obstacle becomes the controlling obstacle due to the runway shift. • Exacerbates the already severe impacts to OEI surface because the buildings in South Boston that have been built to the 40:1 (+35') Departure Surface from the existing Runway 9 threshold (or Departure End (DER)). This already causes weight penalties for aircraft departing Runway 27 and would only be further exacerbated. Shifting the Runway 27 threshold to the west would likely cause an increase in landing minimums due to the missed approach surfaces in relation to the existing downtown buildings and degrade the Runway 27 arrival capacity.

ID #	Commenter	Comment	Response
9.9	AIR, Inc.	First is the false assertion that the existing injunctions on the location of the thresholds of the relevant runways would be difficult to obtain and would involve extensive federal involvement, including approval by the Secretary of Transportation. We ask that the Secretary specifically require Massport to address the actual history of this issue, with court citations, in the FEIR.	Over the years, local courts have issued Logan Airport specific injunctions that prohibit moving the runway threshold locations of Runways 4L, 22R and 9; accordingly, the selected alternative must be consistent with these injunctions. The processing of lifting or modifying the existing injunctions would require community involvement, court review, potential further litigation, additional environmental review processes, and the approval of FAA; the outcome of all these processes is not guaranteed and would take several years. Regardless of the injunction, any shifting or relocating of runways (or taxiways) in this area to accommodate shifting of Runway 9-27 to the west would complicate a complex area even further and impact safety.
9.10	AIR, Inc.	The second basis for opposition is that the relocation of thresholds to the west would cause significant operational disruption at the airport. This issue needs more detailed treatment than the superficial discussion in the DEIR provides.	See response to Comment 9.8. In addition, the relocation of thresholds to the west would require relocation of navaids and runway end lights, modification of markings and signage, modifying Taxiway M, impacting the ARFF ramp and aircraft access to Runway 4R, and possible pilot confusion.
9.11	AIR, Inc.	We request that the Secretary require Massport to specifically address this issue [determining aircraft requirements] in consultation with the FAA Office of Flight Standards or other responsible FAA official who will make the relevant decisions on operational requirements for obstruction evaluation in this case. In the event that operational requirements for clearing obstructions should be an issue under one or more environmentally preferential alternative RSA designs, the Secretary should require Massport to list the various procedural and operational implications in detail in a comprehensive manner.	Pilots select runways on many factors including wind, weather, weight, procedures, and obstructions. This depends to the design specifications of the aircraft being flown, airline training and requirements, and guidance from air traffic control and presence of other aircraft. Runway 9-27 Runway Safety Area Alternatives Study included key stakeholders such as airline chief pilots, Logan Airport Air Traffic Controllers, and FAA regional representatives.
9.12	AIR, Inc.	Finally, FAA notes that the availability of EMAS is contingent on the resolution of a lawsuit involving FAA and the two competing manufacturers of FAA approved EMAS-like systems. We ask the Secretary to make any approval of this DEIR contingent upon the successful resolution of this litigation.	This issue regarding EMAS manufacturers was fully resolved when the two companies previously in litigation joined forces. There are currently two different types of EMAS systems available, both from the same parent company.

ID #	Commenter	Comment	Response
9.13	AIR, Inc.	The DEIR's Table ES-1 provides a graphic representation of Massport's flawed decision making, very explicitly representing their preference to inflict what they consider to be small negative environmental impacts in order to avoid undisclosed operational costs. Within this graphic, Massport classifies the shading of 137,700 square feet (3.2 acres) more shellfish habitat and driving of 326 twenty-inch more square concrete piles as 'partially avoiding and minimizing environmental impacts.' Local residents do not so easily accept the conclusion that another few acres loss is reasonable and can be mitigated with fees paid to the Department of Wildlife and Fisheries, as is proposed by Massport. Nor do environmental activists and long-time stewards of the local salt marshes so readily accept Massport's conclusions that another 3.2 acres of destruction will not result in significant impacts.	This is a federally required airport safety project. Massport has worked closely with FAA and the design team to develop a proven safety enhancement while significantly reducing environmental impacts. As part of the permitting process, Massport will be required to develop more detailed mitigation strategies based on the final design/construction program. Through the MEPA process, Massport has clearly identified the range of landside and marine impacts and committed to mitigate those impacts in accordance with applicable federal, state, and local environmental regulations. Based on the findings of the RIM Study (see Draft EA/Final EIR Appendix B, *RIM Study*), FAA determined that the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of Alternative 4B – EMAS on 300-Foot-Wide Deck (the actual width of the deck would be 306 feet to allow for safety rails). This determination by FAA set the stage for Massport to develop the deck foundation support options in Tier 2 analysis.
9.14	AIR, Inc.	This expansion will harm the ecology of Winthrop Harbor and Belle Isle Marsh, impact water flow and sediment build up in navigable waters and at the site of multiple marinas, and pose an unnecessary danger to boats navigating those same waters, and reduce the use and access to the State of Massachusetts' public waters.	The modeling studies presented in the DEIR demonstrate that the project would have no adverse impacts on the adjacent navigation channel or Snake Island from changes in water flow or sedimentation.

9.15	AIR, Inc.	Massport's unfortunate decision to select design alternative 4b, a modified engineered materials arresting system (EMAS) was made, in a self-enforced planning vacuum, without early community input, and without quantitative evaluation of public benefits and environmental costs. In isolation Massport has reached the conclusion that negative environmental and community impacts are preferable to undisclosed operational costs.	FAA has determined that Alternative 4B meets its federal runway safety standards. Construction of the RSA will also need to meet FAA design standards. Refer to FAA's Runway Determination dated January 23, 2019, where it was stated "This alternative is preferred as it will provide the highest level of aircraft safety without reducing the operational capability of the Logan Airport airfield while also minimizing environmental impacts from additional construction in the harbor" (see Appendix B, *RIM Study*). Based on the findings of the RIM Study, FAA determined that the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of Alternative 4B – EMAS on 300-Foot-Wide Deck (the actual width of the deck would be 306 feet to allow for safety rails). This determination by FAA set the stage for Massport to develop the deck foundation support options in the Tier 2 analysis. Massport has obtained public input throughout the scoping, planning, and analysis of the Project. This will continue through project permitting. Massport held a virtual pre-ENF filing public meeting on June 29, 2021, after reaching out to local and state elected officials, representatives in East Boston and Winthrop, the MCAC, and community interest groups. Notice of the meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. The meeting was attended by representatives from State Representative Adrian Madaro's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens. Massport filed an ENF with the Massachusetts EEA on August 31, 2021. The ENF was circulated to interested parties and a Public Notice of Environmental Review was published on September 2, 2021. A virtual public consultation session on the ENF was held on September 22, 2021, for the EEA to receive comments on the Project. The EEA Secretary issued a Certificate on the ENF on October 8, 2021, confirming the need to prepare an EIR and outlining the DEIR scope elements. On June 30, 2022, Massport filed a DEIR for the Project with the EEA. A Public Notice of Environmental Review was published in the Environmental Monitor on July 8, 2022, and the DEIR was circulated to those who commented on the ENF and other interested parties. A two-week extension of the comment period was granted at the request of Massport to allow for additional public review of the DEIR. The extended comment period closed on August 22, 2022. The Secretary of EEA issued a Certificate on the DEIR on August 29, 2022, confirming that the DEIR properly and adequately complied with MEPA regulations and outlining the scope of the Draft EA/Final EIR. The DEIR and the Secretary's DEIR Certificate are available on Massport's website at https://www.massport.com/massport/about-massport/project-environmental-filings/logan-

ID #	Commenter	Comment	Response
			airport/. The DEIR and the Draft EA/Final EIR were circulated and distributed in accordance with 301 CMR 11.16. Both were made available publicly on Massport's website (https://www.massport.com/logan-airport/about-logan/environmental-reports/) with printed copies available upon request and also available for review at the public libraries listed in Appendix G, *Distribution List*.

ID #	Commenter	Comment	Response
9.16	AIR, Inc.	AIR, Inc. encourages the Secretary to find Massport's preferred alternative to be inappropriate given the existence of no cost, 100% satisfactory environmentally beneficial alternatives. We ask that the Secretary require Massport to reopen their alternatives selection process to include community input and provide responses to the many data and planning deficiencies highlighted above.	In the Certificate on the DEIR published August 29, 2022, the Secretary indicated that "Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Draft Environmental Impact Report (DEIR) and hereby determine that it adequately and properly complies with MEPA and its implementing regulations." Massport obtained public input throughout the scoping, planning, and analysis of the Project. Massport held a virtual pre-ENF filing public meeting on June 29, 2021, after reaching out to local and state elected officials, representatives in East Boston and Winthrop, the MCAC, and community interest groups. Notice of the meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. The meeting was attended by representatives from State Representative Adrian Madaro's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens. Massport filed an ENF with the Massachusetts EEA on August 31, 2021. The ENF was circulated to interested parties and a Public Notice of Environmental Review was published on September 2, 2021. A virtual public consultation session on the ENF was held on September 22, 2021, for the EEA to receive comments on the Project. The EEA Secretary issued a Certificate on the ENF on October 8, 2021, confirming the need to prepare an EIR and outlining the DEIR scope elements. On June 30, 2022, Massport filed a DEIR for the Project with the EEA. A Public Notice of Environmental Review was published in the Environmental Monitor on July 8, 2022, and the DEIR was circulated to those who commented on the ENF and other interested parties. A two-week extension of the comment period was granted at the request of Massport to allow for additional public review of the DEIR. The extended comment period closed on August 22, 2022. The Secretary of EEA issued a Certificate on the DEIR on August 29, 2022, confirming that the DEIR properly and adequately complied with the MEPA regulations and outlining the scope of the Draft EA/Final EIR. The DEIR and the Secretary's DEIR Certificate are available on Massport's website at https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/. The DEIR and the Draft EA/Final EIR were circulated and distributed in accordance with 301 CMR 11.16. Both were made available publicly on Massport's website (https://www.massport.com/logan-airport/about-logan/environmental-reports/) with printed copies available upon request and also available for review at the public libraries listed in Appendix G, *Distribution List*.

ID #	Commenter	Comment	Response
10.1	Margaret Roberts (Resident Winthrop)	I am concerned this will have both permanent, and temporary negative results for the shared harbor and surrounding community. The Point Shirley area as well as other parts of Winthrop are already at risk for flooding. As sea levels rise I fear this project, along with increased airline activity will do nothing but increase our vulnerability in the face of the dangers of climate change.	The Project is being designed to enhance safety while minimizing impacts to the harbor environment and is not expected to have an impact on off-airport or on-airport flooding. Massport has a range of resiliency programs in place to reduce risk associated with climate change-related impacts. In 2022, Massport published its Roadmap to Net Zero by 2031, which is aimed at reducing GHG emissions from Logan Airport and other Massport facilities. As described in Section 3.5.3.2 (pg. 3-24) of Draft EA/Final EIR Chapter 3, *Affected Environment and Environmental Consequences*, Massport developed and adopted a set of design guidelines in 2014 for flood resiliency in the *Massport Floodproofing Design Guide*. The *Massport Floodproofing Design Guide* is incorporated into capital planning and real estate development processes to make its infrastructure and operations more resilient to flooding.[2] The *Massport Floodproofing Design Guide* established design flood elevations for future flood scenarios that are potentially more stringent than those required by current building codes. The Massachusetts Coastal Flood Risk Model is used to assess potential flooding vulnerabilities for Massport projects along the coastline. In 2020, Massport performed a safety rehabilitation of Runway 9-27 to enhance the surface of the runway. As part of that effort, and with the knowledge that some type of improvement to the Runway 27 End RSA would be upcoming, the runway threshold was raised 10 inches from its existing elevation. The 10-inch adjustment was made to account for any potential safety area construction extending out into Boston Harbor and sea level rise. The rise in elevation was made to the maximum extent practicable in relation to the remainder of the airfield. The FAA has set criteria and requirements in relation to grade change. The rise in elevation results in a deck which would be higher than the Runway 4R light pier and Runway 33L End RSA deck.

2 Massachusetts Port Authority, Massport Floodproofing Design Guide, November 2014, revised November 2018, https://www.massport.com/media/2xacmacm/massport-floodproofing-design-guide-revised-november-2018.pdf.

Appendix B- RIM Study

This Page Intentionally Left Blank.

B.1- FAA RSA Determination Form

This Page Intentionally Left Blank

APPENDIX B. RSA DETERMINATION FORM

1. **LOCID:** BOS **City/State:** Boston, Massachusetts
2. **Airport Name:** General Edward Laurence Logan International Airport
3. **Runway:** 09/27
4. **DETERMINATION:**

☐ RSA Meets Standards

☐ The Existing RSA Does not meet standards but it is practicable to improve the RSA so that it will meet current standards.

☒ The existing RSA can be improved to enhance safety, but the RSA will still not meet current standards.

☐ The existing RSA does not meet current standards, and it is not practicable to improve the RSA.

5. ☒ **RSA Determination Replaces Previous Determination:** 06/06/2004
(Date of previous determination)

6. **Part 139 Airport:** ☒ OR **RSAI Attached (Non-Part 139 Airport):** ☐

7. **Visibility Minimums (check one):** ☐ >= ¾ NM ☐ < ¾ NM __ Runway End
☐ >= ¾ NM ☐ < ¾ NM __ Runway End

8. **Aircraft Approach Category/Airplane Design Group:** V

9. **RSA Standard (AC 150/5300-13):** 1000' Length 500' Width

10. ***Existing*** **RSA Dimensions measured from runway end, stopway end, or end of Landing Distance Available (LDA) or Accelerate Stop Distance Available (ASDA) if declared distances published in the Airport Facility Directory:**

Runway Apch End	Length (existing)	Width (existing)	Dimensions Uniform?
09	1000'	500'	Yes
27	150'	500'	Yes

11. Selected Improvement Alternatives:

a. All improvements complete (skip to item 14): ☐

b. Runway Length/Position Alternatives:

Rwy Apch End	Relocate	Shift	Realign	Shorten	Declared Distances	Other (specify)

Relocate = Move entire runway to new position

Shift = Move or slide existing runway along its longitudinal axis

Realign: Rotate runway axis

Declared Distances (if applicable)

Runway Apch End	TORA	TODA	LDA	ASDA

c. Expand/Grade RSA surface:

Runway Apch End	Acquire Land to Increase Size	Grade Surface	Install Standard EMAS (Full Dimension RSA)	Non-Standard EMAS (Non-Standard RSA)
27				300' wide deck with EMAS type product in the future

12. Object Removal:

Runway Apch End	Relocate Road/Highway	Relocate Utilities	Relocate Fencing	Other (specify)

NOTE: NAVAIDS are tracked in the RSAI database, or RSA Inventory, and addressed through a separate process. FAA-ATO Tech Ops issues an RSAI Project Compliance Notice when a non-standard, FAA-owned NAVAID is removed or retrofitted within an RSA. Completed ATO Technical Operations RSAI Project Compliance Notices must be attached to the RSAD.

13. **Supporting Documentation/Rationale:** This determination is based on the best, current available information. If information becomes available at a later date that can effect changes or revisions to this determination, the determination will be revised.

The following documentation supports this determination:

Attached	Supports RSAD	Type of Documentation
☐	☐	Runway Safety Area Inventory
☐	☐	Airport Master Record or Airport Facility Directory
☐	☐	Approved Airport Layout Plan Click here to enter text. (Date)
☐	☐	On-site verification by sponsor, State, ADO or Certification Inspector
☐	☐	NOAA/NGS Obstruction Chart
☐	☐	As-Built Construction Plans Click here to enter text. (Date)
☐	☐	Approved Airport Certification Manual
☐	☐	Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems Study (Order 5200.9)
☐	☐	Correspondence from Airport
☒	☐	Other (Specify) RSA analysis from planning study

14. **Narrative Documentation/Comments (summary of preferred RSA improvement alternative(s), summary of completed improvements, documentation of deviation from selected RSA improvement alternative, documentation of unusual circumstances etc.) (Attach additional sheets if necessary):**

The preceding sections have described several alternatives to address the RSA deviations from design standards for Runway 9-27. Based on consideration of these alternatives and their attributes and constraints, the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of Alternative 4B – EMAS on a 300'-wide deck (the actual width of the deck would be 306' to allow for safety rails). This alternative is preferred as it will provide the highest level of aircraft safety without reducing the operational capability of the BOS airfield while also minimizing environmental impacts from additional construction in the harbor.

This preferred alternative recognizes the fact that EMAS is not currently available until at least 2021, pending the planned sunset of a legal agreement between EMASMAX and the FAA on the sales of the RunwaySafe EMAS system in the United States. However, considering this reality, all indications from FAA and airport industry resources have been that an EMAS system will be available once the legal agreement sunsets. The availability of the EMAS system will likely coincide with the completion of the estimated 2 to 3 year permitting process required for the EMAS deck (see below). This alternative closely follows the previously adopted mitigation for Runway 33L.

15. **Signatures:**

Kelly J. Slusarski — Date: 1/18/2019

Planning & Engineering Branch Manager

Gail B. Lattrell — Date: 1-23-2019

Acting, New England Region Airports Division Director

B.2- Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study

This Page Intentionally Left Blank.

Boston Logan Airport

Runway Incursion Mitigation Study

Runway 9-27 Runway Safety Area (RSA) Alternatives Study

January 8, 2019

This Page Intentionally Left Blank.

Table of Contents

List of Exhibits

1.0 Runway 9-27 Runway Safety Area (RSA) Alternatives Study

1.1 Introduction

As part of the Boston Logan International Airport (BOS, or the Airport) Runway Incursion Mitigation Study and Comprehensive Airfield Geometry Analysis, the airfield was reviewed to identify locations where the airfield did not fully conform to current FAA dimensional criteria and design standards. RSA's for Runway 9-27, 4L-22R, 4R-22L were identified as not meeting current FAA design standards.

This study focuses on the Runway 9-27 RSA Alternatives. This analysis is intended to evaluate options to bring the Runway 9-27 RSA into substantial conformance with FAA design standards or, if that is not practicable, to further enhance compliance and the safety of flight activity on Runway 9-27 at BOS, reducing potential impacts to personal safety and property.

1.2 Background Information

The following section briefly overviews some topics of background information influencing this analysis, including:

1.2.1 RSA Requirements

1.2.2 Runway Utilization

1.2.3 Declared Distances Overview

1.2.4 Engineered Materials Arresting Systems (EMAS) Overview

1.2.5 Runway Injunction Considerations

1.2.6 Environmental Challenges

1.2.1 Runway Safety Area (RSA) Requirements

To the extent practicable, airports receiving federal funding for airport improvement projects are required to meet RSA design standards as detailed in Advisory Circular 150/5300-13A, Change 1, *Airport Design*.

RSA's are required to meet dimensional standards, longitudinal and lateral grade requirements and be free of objects and vegetation that could damage an aircraft in the event of an overrun, undershoot, or excursion. The RSA must be capable, under dry conditions, of supporting aircraft rescue and firefighting (ARFF) activity, and the

occasional passage of aircraft without causing structural damage to the aircraft. The FAA specifically precludes the granting of a Modification to Design Standards for a non-standard RSA in their criteria, requiring that RSA's be assessed through an RSA Determination of Practicability to identify the most practicable and feasible option for improving non-standard RSA's.

Runway 9-27 is classified as a Runway Design Code (RDC) D-V runway. The standard RSA dimensions for Runway 9-27 should be as follows:

RSA Length Beyond Departure End: 1,000'
RSA Length Prior to Threshold: 600'
RSA Width: 500'[1]

Acceptance of a recommended action through an RSA Determination of Practicability is only valid for five years before a reevaluation is required. A previous determination was made in 2004 regarding the practicability of meeting RSA requirements on Runway 9-27.

1.2.2 Runway Utilization

From an operational configuration perspective, Runway 9 and Runway 27 operations constituted approximately 31% of all operations at BOS in 2017. Although ADG V aircraft will tend to ask for Runway 4R for takeoff/landing or 22L for landing when in Northeast and Southwest flows, the potential impacts have become more critical over the last several years as ADG V aircraft use Runway 9-27 relatively frequently for arrivals in Northwest and Southwest flows. Based on a review of 2017 operations data as shown in **Table 1.1** below, of the 125,631 operations on Runway 9-27, approximately 10 operations were by ADG VI aircraft, 2,600 operations were by ADG V aircraft, 6,000 operations were by ADG IV aircraft, and 90,300 were by ADG III aircraft. The remaining operations were by ADG II and I.

Table 1.1 Runway 9-27 Utilization by ADG

Airplane Design Group	2017 Operations	Percentage
ADG I and II	26,700	21%
ADG III	90,300	72%
ADG IV	6,000	5%
ADG V	2,600	2%
ADG VI	10	0.01%
Source: BOS 2017 Operational Data		

[1] FAA Advisory Circular 150/5300-13A, Change One, Table 3-5

1.2.3 Declared Distances Overview

As set forth in Advisory Circular 150/5300-13A, Change 1, declared distances represent the maximum distances that are available and suitable for meeting the takeoff, rejected takeoff and required landing distances based on the performance requirements for turbine powered aircraft[2]. Declared distances may be used to:

- Obtain additional RSA and/or ROFA by restricting declared runway length.
- Mitigate incompatible land uses within the Runway Protection Zone (RPZ).
- Meet runway approach and/or departure surface clearance requirements.
- Mitigate environmental impacts.[3]
- Provide additional departure length by establishing clearways.

Four specific declared distance values are employed consisting of:

Takeoff Run Available (TORA) – the distance to accelerate from brake release to lift-off. The TORA must not exceed the length of the runway. The location of the Departure RPZ is tied to the declared end of the TORA, and land use compatibilities can influence a reduction in the TORA.

Takeoff Distance Available (TODA) – the distance to accelerate from brake release past lift-off to start of takeoff climb. The TODA can exceed the length of the runway if a designated clearway exists beyond the runway end in the direction of takeoff. If there is no clearway, then TODA cannot exceed the length of the runway. The length of the TODA can be limited by obstacles in the 40:1 instrument departure surface.

Based on a review of airport facility information there are no designated clearways on any of the runway ends at BOS.

Accelerate-Stop Distance Available (ASDA) – the distance to accelerate from brake release to the decision velocity (V_1) and then decelerate to a stop. The ASDA must not exceed the length of the runway, unless a designated stopway has been provided beyond the runway end in the direction of the attempted takeoff. When the standard RSA length beyond the end of a runway is not provided, additional RSA may be obtained beyond the ASDA by reducing the ASDA length to provide the standard RSA.

Landing Distance Available (LDA) – the distance from the landing threshold to complete the approach, touchdown and decelerate to a stop. The LDA must not exceed the length of the runway. Similar to ASDA, LDA is dependent on

[2] FAA Advisory Circular 150/5300-13A, Change One, Chapter Three, Section 322
[3] Ibid.

the length of RSA beyond runway end for overruns, but also considers having sufficient undershoot RSA length.

While not technically a declared distance value, a key factor in the available landing length is Land and Hold Short Operations (LAHSO). LAHSO operations are conducted frequently at BOS for operations on various runways. Available landing length may be reduced further than the declared LDA upon pilot acceptance of a landing clearance with LAHSO, and this available distance does not require the RSA requirements and clearances that LDA does.

Declared distances are typically employed where the full length of a runway may not be able to be used due to issues such as deficient RSA or ROFA length, or obstructions penetrating an approach or departure surface off one or both ends of a runway. As an example, the use of declared distances can be employed when runway pavement on one or both ends is not available for a landing operation but is available for takeoff operations in the opposite direction. In this case, the operational lengths are declared for each of the four noted categories. Subsequent sections will list the existing declared distances at the airport and identify the value or lack of value that adjusted declared distances may provide to address RSA provisions.

1.2.4 Engineered Materials Arresting System (EMAS) Overview

EMAS is an installation of energy-absorbing material based on the critical aircraft anticipated for a particular runway. EMAS functions by crushing under the weight of and surrounding an aircraft landing gear system as it enters and continues into the material bed, acting to safely stop an aircraft without significant damage to the aircraft. EMAS provides a potentially viable alternative in situations where land area is not available to provide the necessary room for a "full dimension RSA". EMAS has demonstrated effectiveness in arresting aircraft overruns. Since 1999 there have been a total of 13 incidents where EMAS has safely stopped overrunning aircraft[4]. A standard EMAS is designed to effectively stop an aircraft from a speed of 70 knots. The length of the EMAS bed varies based on the characteristics of the most critical aircraft anticipated to operate on the runway requiring the EMAS. Per the FAA, a standard EMAS provides a level of safety that is equivalent to a full dimension RSA.

Prior to September 2018, there were two manufacturers of EMAS products that met the FAA requirements set forth in Advisory Circular 150/5220-22B "Engineered Materials Arresting Systems for Aircraft Overruns". The first and most prevalent system used in the U.S. is **EMASMAX** which is composed of blocks of lightweight, crushable cellular concrete. The manufacturer of this specific system ceased the manufacturing of the blocks in September 2018. Most or all of the inventory of previously produced blocks have been sold. Repair of EMASMAX systems and older EMAS systems from the same manufacturer can only be repaired with the same technology block system so once the blocks are gone and production ceased, the

[4] https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=13754

ability to repair damage from equipment or aircraft will require a full replacement with an alternative EMAS technology. The lifecycle and maintenance requirements of this system generally dictate replacement every 10-20 years.

The **Runway Safe** EMAS is the second approved product and consists of a foamed silica bed made from recycled glass contained in a plastic mesh system anchored to pavement at the end of the runway. The silica bed is covered with a cement layer and treated with a sealant for weather protection. Four Runway Safe EMAS systems have been installed in the U.S., all of which are at Chicago's Midway Airport. Runway Safe is currently precluded from selling new systems in the U.S. until September 2020 stemming from a negotiated agreement with the manufacturer of the EMASMAX system.

As a part of the evaluation of RSA alternatives, reference is made to the requirements of FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems.* This order provides additional guidance on comparing RSA alternatives to EMAS to determine financial feasibility. This guidance is suggested for airports that display one or more of the criteria:

- The existing RSA determination indicates that the RSA does not meet full dimension RSA standards, but it is practicable for it to meet the standard through some other means.

- The runway serves air carriers at a commercial service airport or is required to meet FAA design standards under federal grant obligations.

- The runway serves aircraft with a maximum takeoff weight (MTOW) of 25,000 pounds or more.

- The width of the RSA or its length beyond the runway end is less than 90% of the RSA standard.

In the case of Runway 9-27 at BOS, one or more of the above criteria come into play. The subsequent RSA alternatives evaluations will expand upon the potential for EMAS where deemed applicable and will define the estimated dimensions of the system to either enhance or provide full equivalence for conforming with RSA requirements.

Because EMAS systems are not currently available, they cannot be considered a short-term mitigation measure for non-standard RSA's.

1.2.5 Runway Injunction Considerations

Over the years local courts have issued injunctions concerning the runway threshold locations of Runways 4L, 22R and 9 at BOS. The injunctions currently in place prohibit moving the Runway Thresholds on each of these three runways.

1.2.6 Environmental Challenges

Some alternatives considered as part of this RSA Study may present environmental challenges of varying complexities that must be factored into the evaluation process.

When environmental impacts cannot be avoided or minimized to meet the project purpose and need, some form of mitigation is typically required. Depending on habitat type and value, mitigation ratios are frequently 2:1 to 3:1 of the impact area. Because wetland resource areas also provide wildlife habit, consideration of off-airport mitigation should be considered to reduce wildlife hazard risks.

The following sections provide an overview of potential environmental issues to be considered.

1.2.6.1 Coastal Beach / Intertidal Flats and Shellfish Habitat

Logan Airport is surrounded on three sides by Boston Harbor and associated coastal resource areas that are protected under federal, state and local regulations. Coastal resource areas are located at the end of Runway 27. Construction activities in or adjacent to these protected waters warrant careful consideration of environmental issues.

The Runway 27 end is surrounded by coastal beach/intertidal flats which are protected under the Massachusetts Wetlands Protection Act (WPA) and the federal Clean Water Act. These areas are relatively flat and have limited vegetation consisting of areas of unconsolidated sand and mud that is exposed during low tide and underwater during high tide[5]. This area is considered habitat for Blue Mussel and Soft-Shell Clams (although currently Soft-Shell Clams are very limited in the Harbor due to disease). These areas around the coastal edge of Logan support a variety of wildlife that needs to be taken into consideration should actions involving placement of fill or other impacts occur. There is expected to be careful review and analysis of projects that have the potential to adversely impact shellfish habitat and separate mitigation strategies may be required.

1.2.6.2 Subtidal Areas

Alternatives recommending construction that extend into the harbor would also affect nearshore subtidal areas. These areas are also protected under the provisions of the Massachusetts WPA and the federal Clean Water Act. Eelgrass, a species of potential significance, is known to exist in the waters between Runway End 27 and 33L but has not been previously identified at the end of Runway 27. Eelgrass is a sensitive type of seagrass that is essential for fish breeding and supporting other marine life. It is

[5] http://www.mass.gov/envir/massbays/bhha_intertidalflats.htm

highly regulated by the State of Massachusetts and is noted as a Special Aquatic Site under U.S. Army Corps of Engineers jurisdiction per (Section 404(b)(1) guidelines.

1.2.6.3 Threatened and Endangered Species Habitat

A U.S. Fish & Wildlife Service Information for Planning and Consultation online review identified the Federally-threatened red knot (*Calidris canutus rufa*) and the Federally-endangered roseate tern (*Sterna dougallii dougallii*) as potentially occurring within Airport property. The majority of the airfield occurs within the Massachusetts Natural Heritage and Endangered Species Program (NHESP) demarcated Priority Habitats of Rare Species (PH 250). This area has been identified as potential habitat for the state-endangered upland sandpiper (*Bartramia longicauda*) and the state-threatened grasshopper sparrow (*Ammodramus savannarum*). In general, the grassland habitat of the Airport should be considered protected by federal and state regulation.

Any vegetated ground disturbances around Runway 9-27 will likely result in a "take" of threatened or endangered species habitat and will require state and potentially federal permits. Mitigation of temporary and permanent impacts is expected to be required.

Atlantic and short-nosed sturgeon are Federal and State endangered species in Massachusetts. Potential impacts to them must be considered under the US Endangered Species Act (ESA) and Massachusetts Endangered Species Act (MESA) for all proposed work in Boston Harbor. Work in Boston Harbor will require a Protected Species Assessment and consultation with the National Oceanic & Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS).

Four turtle species and two whale species are also listed under the ESA which, while uncommon, can be found in Boston Harbor. These species include the threatened Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead, green; and DPS of endangered Kemp's ridley, and endangered leatherback turtles. North Atlantic right whales and fin whales are both listed but are found further offshore.

Habitat for winter flounder and other species in Boston Harbor is protected under the Magnuson Stevens Conservation and Management Act. Any work in Boston Harbor will require an Essential Fish Habitat Assessment and consultation with NMFS and the Massachusetts Department of Marine Fisheries (DMF).

Additional coordination with NMFS will be necessary to assess potential impacts to species protected under the Marine Mammal Protection Act.

Mitigation for impacts to fish and marine mammal habitat generally includes restrictions on in-water work during spawning seasons, restrictions on siltation, and restrictions on underwater noise and vibration.

1.2.6.4 Floodplains

The area adjacent to the Runway 27 end is in the 100-year floodplain as defined by the Federal Emergency Management Agency (FEMA). Any reduction in flood storage as the result of projects will require mitigation.

1.2.6.5 Tidelands and Chapter 91

Certain alternatives also have potential to impact waterways and Commonwealth Tidelands around the Airport perimeter, which are protected by the Massachusetts Public Waterfront Act[6] (aka Chapter 91) and require authorization prior to implementation. Any work seaward of the mean high-water line surrounding Logan Airport requires authorization under Chapter 91. Actions requiring prior authorization generally include the placement or construction of any temporary or permanent structures, placement of fill in a waterway and the excavating or dredging of materials in any waters.

At the approach end to Runway 27, the mean low water line is roughly coincident with the Massport property boundary. As such, work in this area to improve the RSA would likely require work off Airport property in Commonwealth Tidelands. In this event, based on provisions of the Massport Enabling Act and the Ch. 91 regulations, authorization for construction of structures and use within Commonwealth Tidelands would be authorized through the Ch. 91 Licensing process which includes signature by the Governor.

1.2.6.6 Construction in Navigable Waters

The US Army Corps of Engineers regulates the construction of any structure in or over any navigable water of the United States under Section 10 of the Rivers and Harbors Act. The area to the northeast of Runway 9-27 includes an undefined navigation channel to several marinas in Winthrop, MA. Construction of any fill or structure in the harbor adjacent to the Runway 27 end will likely require a Section 10 review and permit. In addition to the physical construction, a security buffer is required adjacent to fill or structure thus the impact to the navigation channel could be greater. Due to the narrow and shallow channel in this area, if a structure extends too far from the existing shore it may not be permittable under Section 10.

1.2.6.7 Federal and State Environmental Policy Acts

Any RSA alternative other than the No Build alternative will require review under the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act (MEPA). Both acts require a comprehensive review of potential impacts

[6] http://www.mass.gov/eea/agencies/massdep/water/watersheds/chapter-91-the-massachusetts-public-waterfront-act.html

of proposed actions. NEPA requires either a Categorical Exclusion (Cat-Ex) determination, or an Environmental Assessment (EA), and in some cases an Environmental Impact Statement (EIS). Before any construction can occur, an approved Cat-Ex, a Finding of No Significant Impact (FONSI) on an EA, or a Record of Decision (ROD) on an EIS are required under NEPA.

MEPA requires an Environmental Notification Form (ENF) and if warranted, a draft and final Environmental Impact Report (EIR).

The environmental areas considered in the NEPA and MEPA reviews include most of the areas discussed above. The NEPA and MEPA reviews can occur simultaneously and commonly take 18 months to 2 years (assuming an EIS is not required).

1.2.6.8 Previous Environmental Studies

Consideration of potential mitigation actions associated with RSA enhancements near the Runway 27 end has been informed by previous environmental analyses conducted as a part of other RSA mitigation actions that were performed at BOS. Environmental review and impact determinations were developed during the construction of the Engineered Materials Arresting System (EMAS) for Runway 33L, which involved much local, state, and Federal agency collaboration. As noted above, inter-tidal and subtidal areas are protected natural resources under federal and state regulations, and construction within these areas can be complex and challenging from an environmental perspective. In addition to demonstrating the least environmentally damaging practicable alternative, a critical element in securing approvals for the Runway 33L RSA deck in these sensitive coastal resource areas was documenting the public safety benefits of bringing that RSA up to current federal safety standards.

During the Runway 33L EMAS construction, there was an unavoidable loss of Eelgrass. The pile-supported deck structure on which the EMAS was placed blocked the sunlight needed for Eelgrass survival. [7] To offset this unavoidable loss, Massport was required by state and federal regulation to provide eelgrass mitigation at a replacement/loss ratio of 3:1.

The Runway 22R inclined safety area (ISA), which was constructed about five years ago, also faced similar environmental issues. The area beyond the runway end was comprised of salt marsh and shellfish habitat of approximately 63,000 square feet. For the Runway 22R ISA installation, the salt marsh had to be relocated with compensation given to environmental and economic losses. The salt marsh was reconstructed off-airport at a 2:1 replacement/loss ratio.

[7] http://www.airportimprovement.com/article/logan-intl-builds-concrete-pier-over-boston-harbor-support-runway-safety-area-extension

1.3 Runway 9-27 Alternatives

As part of the development of alternatives to mitigate deficiencies in RSA length and/or width, the existing lengths were utilized as the baseline for this alternatives analysis. It is important to note that portions of perimeter vehicle service roads currently cross the existing runway safety areas of Runway 27 due to the limited land available and that these roads are marked with stop signs and painted stop bars. Based on conversations between Massport and the FAA New England Region, we request that this existing vehicle control protocol be considered acceptable mitigation for the perimeter vehicle service roads within the RSA.

On the approach end of Runway 9 (West end of Runway) the current RSA meets the full dimension RSA standards. The RSA on the approach end of Runway 27 (east runway end) does not meet design standards for either RSA undershoot or overrun RSA criteria. The existing RSA on the Runway 27 end is 500 feet in width but provides only 150 feet of length[8] beyond the runway end. There is currently a vehicle service road that crosses the end of Runway 27 at approximately 85 feet from the threshold. As mentioned previously, we are requesting that the presence of stop signs/stop bars on the perimeter vehicle service road be considered mitigation for this deficiency. Based on this, the current Runway 27 RSA beyond the runway end is 850 feet deficient to meet a full dimension RSA to protect for aircraft overruns and 450 deficient to meet the undershoot RSA requirement of 600 feet.

Six (6) action alternatives, including two sub-alternatives, have been identified as potential options to provide the requisite safety area and are listed below, in addition to the no-action alternative.

(1) Declared Distances

- Employ declared distances to the current runway configuration to meet RSA requirements.

(2) Displaced Threshold Markings

- Additional RSA beyond the departure end of Runway 9 could be obtained through the use of displaced threshold markings at the Runway 9 threshold.

(3) Full RSA

- Fill and construct additional RSA to provide a minimum of 500 feet in width and extending a minimum of 850 feet into Boston Harbor to provide a full dimension RSA[9]. Both fill (Alternative 3A) and deck (Alternative 3B) options are explored

[8] 2004 RSA Determination, Airport Certification Manual

[9] NOTE: Additional width and length of the fill pad would be provided to accommodate the alignment of the airport perimeter roadway adjacent to the boundary of the RSA.

(4) EMAS

- Install a standard EMAS either on a 500' wide deck (Alternative 4A) or a 300' wide deck (Alternative 4B) into Boston Harbor to provide an equivalent level of RSA protection.[10]

(5) No Action

- The no-action alternative is also considered should none of the action alternatives be deemed to be feasible or practicable due to operational, environmental impacts, or from a financial feasibility perspective.

1.3.1 Runway 9-27 Alternative 1 - Declared Distances

The utilization of declared distances to mitigate potential RSA dimensional standard issues, non-compatible land uses in the RPZ or other constraints impacting a runway alignment has been broadly applied at numerous airports in the U.S. In the case of Boston's Runway 9-27, declared distances would be applied to the current 7,000-foot alignment to provide for a full dimension RSA without having to initiate construction in Boston Harbor off the east end of the runway. The existing declared distances for Runway 9 and Runway 27 as currently published are listed in **Table 1.2** below.

Table 1.2 Runway 9-27 Existing Declared Distances

	Runway 9 (ft)	Runway 27 (ft)
Takeoff Run Available (TORA)	7,000	7,000
Takeoff Distance Available (TODA)	7,000	7,000
Accelerate-Stop Distance Available (ASDA)	7,000	7,000
Landing Distance Available (LDA)	7,000	7,000

Source: Airport Master Record, 5010, BOS 1/3/2018.

Comparing the existing declared distances as published in the FAA 5010 Airport Master Record and listed in **Table 1.2** to the total length of Runway 9-27, indicates that no adjustment has been made to the declared distances for Runway 9-27 for the purposes of providing a standard RSA or ROFA. It has been assumed that these distances were based on the criteria set forth in AC 150/5300-13A or its predecessors and reflect the incorporation of any impacts associated with penetrations of the 40:1 departure surfaces would have on the location of the end of the TODA for each runway

[10] NOTE: the width and length of the fill pad or structure would also include sufficient area to accommodate the alignment of the airport perimeter roadway around the end of the EMAS bed.

end. In the case of departures on Runway 27, penetrations to the 40:1 departure surface have been mitigated by increasing the climb gradient from the standard 200' per nautical mile to over 477' per nautical mile, resulting in the TODA consisting of the full 7,000' length of the runway.

The ASDA and LDA values listed in Table 1.1 also indicate the full runway length being available for accelerate stop distance and landing distance despite the deficient length for full dimension overrun and undershoot RSA's on this runway end. The 2004 FAA RSA determination for this considered declared distances as a potential mitigation option. The full-length mitigation option was dismissed on the basis that providing the required RSA was not possible due to a lack of land off the eastern end of Runway 9-27. This factor likely provided the basis for the assumption that the entire 7,000-foot long runway would be available for ASDA and LDA despite the significant deficiencies in both overrun and undershoot RSA length.

Application of declared distances to achieve a standard RSA on the east end of Runway 9-27 would not impact the runway length values for TORA or TODA as values are correlated to whether obstacles penetrate the 40:1 departure surface or have incompatibilities with the departure RPZ. Declared distances would, however, trigger changes in the length of available runway for meeting ASDA and LDA from the values shown in Table 1.1 The resulting declared distances for TORA, TODA, ASDA and LDA that would provide a full dimension RSA on the east end of Runway 9-27 are listed in **Table 1.3** and depicted in **Exhibit 1.1**. TORA and TODA remain the full length of the runway, as their lengths are not tied to RSA length.[11] Utilization of declared distances would negatively impact the LDA on both Runway 9 and Runway 27.

Table 1.3 Runway 9-27 Proposed Declared Distances

	Runway 9 (ft)	Runway 27 (ft)
Takeoff Run Available (TORA)	7,000	7,000
Takeoff Distance Available (TODA)	7,000	7,000
Accelerate-Stop Distance Available (ASDA)[12]	6,150	7,000
Landing Distance Available (LDA)	6,150[13]	6,550[14]
Source: Kimley-Horn Analysis, May 2018		

[11] There is no indication in the airport facility directory or other materials of any designated clearway or stopway on this runway.

[12] Length of ASDA reduced to provide a 1,000' long by 500' wide RSA beyond the end of usable pavement.

[13] Length of LDA results from an 850' deficiency in the length of the RSA on east end of Runway 9-27

[14] Length of LDA on Runway 27 due to 450 feet deficiency of the undershoot RSA.

DRAWING LEGEND

- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL DISPLACED THRESHOLD
- POTENTIAL PAVEMENT PAINTING
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

POTENTIAL RUNWAY 9 DECLARED DISTANCES

TORA- 7,000'
TODA - 7,000'
ASDA - 6,150'
LDA - 6,150
600'
1,000'

POTENTIAL RUNWAY 27 DECLARED DISTANCES

1,000
LDA 6,550'
ASDA - 7,000'
TODA - 7,000'
TORA - 7,000'
600'
450'

TIDAL FLAT
BOSTON HARBOR
WINTHROP BOSTON
MASSPORT FIRE–RESCUE STATION 2
MASSPORT FIRE–RESCUE STATION 1 (HQ)
PERIMETER ROAD
GOVERNORS ISLAND
FIRE TRAINING FACILITY
FAA ASR9 SITE
APPROX. AIRPORT BOUNDARY
EMAS
ROFA
RSA

DRAFT - NOT FOR PUBLIC DISSEMINATION

bostonlogan

GRAPHIC SCALE IN FEET
0 400 800 1600

NORTH

EXHIBIT 1.1
RUNWAY 9-27 RSA ALTERNATIVE 1 - DECLARED DISTANCES
DIMENSIONAL GAP ALTERNATIVES

This Page Intentionally Left Blank.

The Runway 9 approach end has a compliant RSA prior to the landing threshold, thereby protecting aircraft landing operations in the event of a runway undershoot or, Runway 27 departure operations in the event of an overrun. However, due to the 850' RSA deficiency on the east end of the runway, both the ASDA and LDA would be reduced from 7,000' to 6,150' feet. When operating in the Runway 27 orientation, the LDA would be reduced from 7,000' to 6,550' and the landing threshold would be moved by 450' to the west to address the 450' length deficiency in the required 600' undershoot RSA. While the 450' reduction in LDA associated with Runway 27 landings would not preclude landings by the predominant narrow-body fleet of aircraft using the runway, it may affect runway occupancy times associated with Runway 27 arrivals and departure operations on Runway 22L due to aircraft not being able to exit at Taxiway E.

Shifting the Runway 27 threshold west by 450' reduces the available distance between the Runway 27 threshold and the exit point onto Taxiway E. Taxiway E is the most frequently used exit point for narrow-body aircraft landing on Runway 27 and the only available exit for aircraft landing on Runway 27 prior to the intersection with Runway 4R-22L and the LAHSO line. Implementing the declared distances alternative reduces the distance between the existing runway threshold and the lead in to Taxiway E from a current 4,260' to 3,810'. This loss of available length for touchdown and roll out has a very clear adverse impact on the utility of Taxiway E as an exit location for aircraft landing on Runway 27. A loss in available landing distance will measurably reduce the efficiency of the airfield. It would also result in aircraft entering Taxiway E at a higher speed which could increase the potential for an inadvertent crossing of the Runway 4R-22L hold bar and possible excursions.

An increased number of aircraft would not exit at Taxiway E due to the loss of length and these aircraft would be required to cross Runway 22L to exit at Taxiway M or K, resulting in increased occupancy time, degradation in arrival capacity on Runway 27 and potential impacts to departures on Runway 22L.

Table 1.4 Runway 9 Takeoff Utilization by ADG

Airplane Design Group	2017 Operations	Percentage
ADG I and II	9,829	20%
ADG III	36,237	74%
ADG IV	1,967	4%
ADG V	908	2%
ADG VI	0	0%

Source: BOS 2017 Operational Data

Virtually all ADG III, IV, and V aircraft departing on Runway 9 with an ASDA of 6,150' will be subject to a weight penalty. As can be seen in the **Table 1.4** above, this includes approximately 49,000 operations or 80% of the aircraft departing Runway

9. Boeing and Airbus Planning Characteristics for Airport Planning manuals were reviewed to obtain an indication of the impact to operational capability on a select portion of the narrow-body fleet that accounts for the predominate use of Runway 9-27. This review considered the following aircraft types: Airbus A320 and A321, Boeing 737-700, 737-800 and 737-900 and accounted for engine types, maximum engine thrust levels, dry runway conditions and two environmental temperatures consisting of both a standard 59-degree Fahrenheit day and standard day plus 15 degrees Celsius which equates to 86 degrees Fahrenheit. This group of aircraft accounts for about 35% of the yearly takeoff operations on Runway 9. **Table 1.5** displays the operational weight restrictions by select aircraft types that would be expected to occur if Runway 9 ASDA was shortened to 6,150'. ASDA is important because many airlines calculate their allowable departure weight based on the amount of ASDA available.

Table 1.5 Maximum Payloads - 6,150' Runway 9 Length

Aircraft and Engine Type	Maximum Takeoff Weight (MTOW)	Standard Day MTOW	Standard Day + 15C MTOW
Airbus (20% of R/W 9 Takeoff Operations)			
A321 - IAE V2500	206,132 lbs.	185,000 lbs.	182,500 lbs.
A321 - CFM56	206,132 lbs.	185,000 lbs.	182,000 lbs.
A320 – IAE V2500	174,165 lbs.	162,000 lbs.	160,500 lbs.
A320 – CFM56	174,165 lbs.	164,500 lbs.	160,000 lbs.
Boeing (15% of R/W 9 Takeoff Operations)			
737-700 – CFM56, 20K Thrust	154,500 lbs.	139,500 lbs.	136,000 lbs.
737-700 – CFM56, 26K Thrust	154,500 lbs.	**No Penalty**	**No Penalty**
737-800 – CFM56, 26K Thrust	174,200 lbs.	157,000 lbs.	154,000 lbs.
737-900 – CFM56, 24K Thrust	174,200 lbs.	146,500 lbs.	142,500 lbs.
737-900ER – CFM56, 26K Thrust	187,700 lbs.	156,000 lbs.	152,500 lbs.

Source: Boeing 737 Aircraft Planning Characteristics for Airport Planning Manual; Airbus A321 Aircraft Characteristics Airport and Maintenance Planning; Airbus A320 Aircraft Characteristics Airport and Maintenance Planning; Kimley Horn Analysis.

Loss of length for ASDA is problematic as ASDA is a key consideration in determining the allowable aircraft departure weight. It is a regulatory violation to operate an aircraft at a weight that would result in the calculated accelerate stop distance exceeding the length of the runway ASDA. As a result, a reduction in ASDA can trigger a reduction in fuel load (weight) and, hence stage length, or a reduction in payload (passengers or cargo), both of which are problematic to the commercial carriers. Given the current 7,000' length of Runway 9-27, an 850' reduction in the length of runway available for use can have a large impact on the utility of the runway for various aircraft models and for longer haul domestic and/or international markets, both of which are forecast to increase.

Table 1.5 documents the impacts that the reduction in ASDA has on the maximum takeoff weights of ADG III aircraft that comprise a significant percentage of the fleet at BOS and the aircraft fleet using Runway 9. Of the narrow-body aircraft models shown in the table, all but the high thrust version of the 737-700 require a reduction in takeoff weight to depart on Runway 9. Achieving this reduction could only be met by either reducing fuel load or payload. Reducing payload would be of considerable concern to the airlines that routinely utilize Runway 9 for departures.

Attributes of Runway 9-27 RSA Alternative 1

- Provides for a full-length RSA in both operational directions.
- Full 7,000' long TORA and TODA is retained and a 7,000' ASDA is retained for Runway 27 operations.
- Does not require new or additional construction.
- Would not incur the environmental impacts that are associated with the options involving constructing a full dimension RSA or a standard RSA using EMAS.
- Alternative 1 would generate little if any public response.

Constraints of Runway 9-27 Alternative 1

- Diminishes the viability of Taxiway E as an exit point when arriving on Runway 27, resulting in more aircraft crossing Runway 4R-22L to access either Taxiway M or K.
- Potential to increase runway occupancy times and decrease arrival capacity on Runway 27 due to loss of Taxiway E viability.
- Aircraft not exiting at Taxiway E would likely be directed to exit at either Taxiway M or Taxiway K, potentially increasing landing roll out times and operational delay.
- Loss of Taxiway E utility could trigger shifting most arriving aircraft to taxi to Taxiway K, potentially causing congestion in the vicinity of Taxiway K and M if aircraft are in queue to hold for crossing Runway 4L-22R on Taxiway K. It could also result in aircraft having to go-around for Runway 27 arrivals if the queue backs up beyond the Runway 27 holdbar.
- Weight restrictions may adversely impact airlines operating ADG III, IV, and V aircraft by triggering reduced payloads and/or a reduction in fuel load which could impact service by these aircraft to longer haul destinations

(both domestic and international) and accounts for about 49,000 operations or 80% of the aircraft departing Runway 9.

- Poses negative impact on Northeast and Southwest flow capacities, which constitute approximately 60% of the airport's operating flows in the summer months.

Alternative 1 Summary:

Based on the preceding discussion, a full dimension RSA could be achieved off both ends of Runway 9-27 through the application of declared distances. However, the impacts to operational flows and efficiency, airfield capacity and the downgrading of the capability of Runway 9-27 to serve its intended purpose and meet the operational demands of a large segment of the air carrier fleet at BOS call into question Alternative 1 as a viable option for addressing the current non-standard RSA condition.

1.3.2 Alternative 2 - Runway Threshold Markings at Runway 9 Departure End

Alternative 2 is an incremental RSA improvement alternative that does not provide full requisite RSA dimensions, but provides for additional RSA length beyond the departure end of Runway 9 where it is currently 850 feet deficient for overruns.

Currently, Taxiway M is aligned with the departure end of Runway 9. This alternative would restripe the aligned taxiway with runway pavement markings as if it were a displaced threshold, and shift the start point of the declared distances for departures on Runway 9 west by approximately 195 feet. This shift would not provide for any change to the operational runway length in either direction. However, because the start and end points of the TORA, TODA, and ASDA would be further west, an additional 195 feet of RSA overrun beyond the departure end can be obtained, reducing the deficiency from 850 feet to 655 feet. Alternative 2 is depicted in **Exhibit 1.2.**

Attributes of Runway 9-27 Alternative 2

- Provides a moderate increase in available overrun protection for departures on Runway 9, which is heavily utilized for departures in northeast flow.
- Would likely result in minimal cost and construction impacts.
- Has side benefit of addressing an existing Runway Incursion Mitigation criteria deficiency of an aligned taxiway at this location.

DRAWING LEGEND

- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL DISPLACED THRESHOLD
- POTENTIAL PAVEMENT PAINTING
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

POTENTIAL RUNWAY 9 DECLARED DISTANCES

TORA- 7,000'
TODA - 7,000'
ASDA - 7,000
LDA - 7,000'

600'
345'

POTENTIAL RUNWAY 27 DECLARED DISTANCES

LDA 7,000'
ASDA - 7,000'
TODA - 7,000'
TORA - 7,000'

195'
1,000'
150'

TIDAL FLAT
BOSTON HARBOR
WINTHROP BOSTON
MASSPORT FIRE–RESCUE STATION 2
MASSPORT FIRE–RESCUE STATION 1 (HQ)
GOVERNORS ISLAND
FIRE TRAINING FACILITY
FAA ASR9 SITE
APPROX. AIRPORT BOUNDARY
EMAS
PERIMETER ROAD
TERMINAL ROAD
BARTLETT PARKWAY
BARTLETT RD.
ORLANDO AVE.
ROSSIDE AVE.
ROFA
RSA

DRAFT - NOT FOR PUBLIC DISSEMINATION

bostonlogan

GRAPHIC SCALE IN FEET
0 400 800 1600

NORTH

EXHIBIT 1.2
RUNWAY 9-27 RSA ALTERNATIVE 2 - DISPLACED THRESHOLD
DIMENSIONAL GAP ALTERNATIVES

This Page Intentionally Left Blank.

Constraints of Runway 9-27 Alternative 2

- Alternative 2 does not provide the requisite safety area of 1,000 feet beyond the runway end, but rather provides a modest increase.

- The shifting of the Runway 9 threshold would require an estimated two to three-year court review process to lift the existing injunction. The outcome is not guaranteed.

1.3.3 Alternatives 3A and 3B – Full Dimension RSA

This alternative would require fill necessary to create a relatively flat, graded area free of objects or vegetation that has the potential to damage aircraft for the dimensions necessary for the RSA. With a width of 500 feet and an additional length required of 850 feet, this would require an additional 45,000 square yards of RSA surface area along with a riprap and sheet piling wall surrounding the perimeter. Riprap provides for wave dispersion against water or ice erosion in bodies of water and will assist in preserving the RSA fill.

To estimate the amount of fill required for the RSA, the average of the harbor depths within the area of the RSA was calculated from NOAA navigation charts and added to the elevation of Runway 27, which is 14 feet AMSL. The harbor averages 11 feet, which equates to a total average depth of 25 feet requiring fill. Accounting for the necessary RSA length and width, an estimated amount of fill needed would be around 375,000 cubic yards. In addition to this requirement, the RSA would need to have a riprap buffer zone to protect from damage by the current in the harbor. Alternative 3A is a full-dimension RSA built in fill and is depicted in **Exhibit 1.3A.** Alternative 3B is a deck version of the full-dimension RSA and is depicted in **Exhibit 1.3B.**

Fill materials would be delivered to the site by barge or trucked from storage areas on the Airport and the majority of the construction related actions would be conducted from the water including the driving of sheet piling and placement of stone riprap and the development of the filled RSA pad.

Attributes of Runway 9-27 RSA Alternatives 3A and 3B

- Provides a fully-compliant RSA for both overrun and undershoot through placement of fill and rip rap protection or a deck in the harbor.

- Offers a more permanent solution without compromising aircraft takeoff and landing performance with declared distances limitations.

- Enhances safety for Runway 27 landings and Runway 9 departures, as Runway 9-27 is used extensively for these operations in various flows.

Constraints of Runway 9-27 Alternative 3A and 3B

- Would require an extensive environmental impact review process due to both permanent and construction impacts to coastal bank / intertidal flats, shellfish habitat, subtidal areas, terrestrial and marine threatened and endangered species, flood plains, and tidelands. Alternative 3A will have the largest impacts of any alternative considered.

- Likely to require environmental mitigation at a 2:1 or 3:1 rate of replacement.

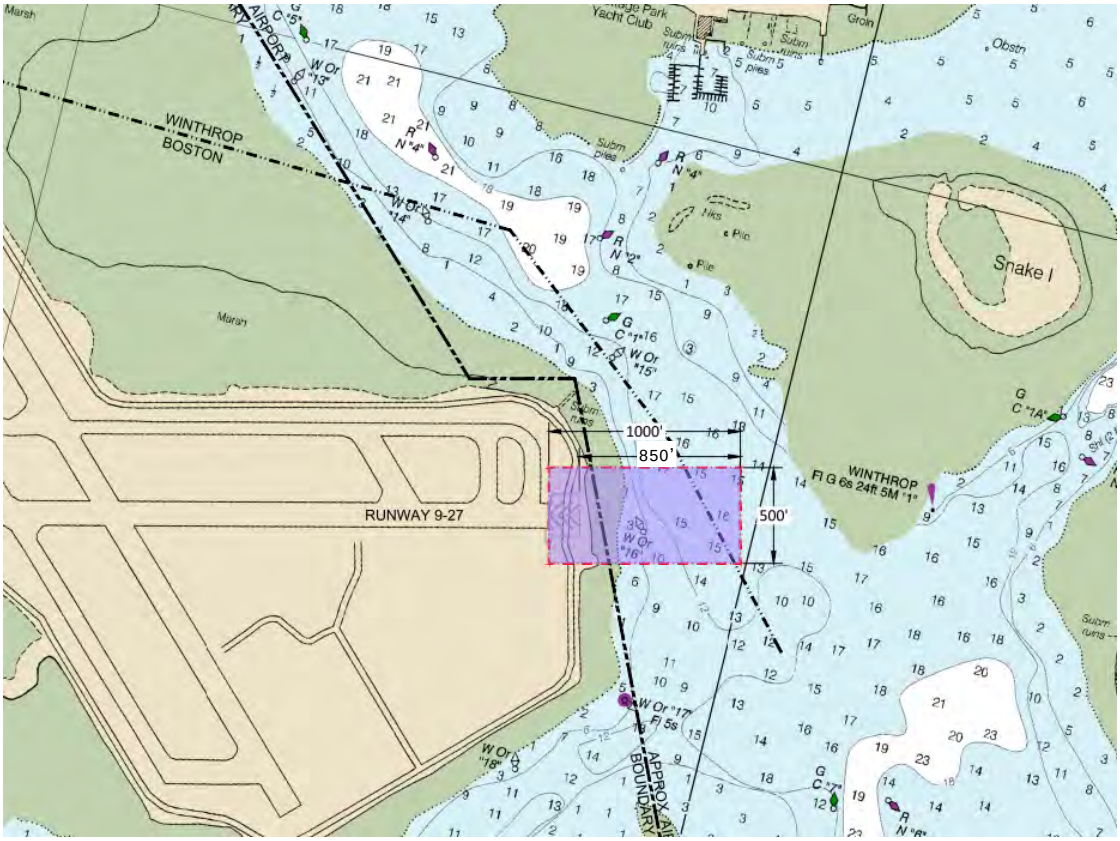
- Very high cost (Alternative 3B is likely more costly than 3A).

- Potential for operational disruption as part of construction due to the need for barges and cranes (Alternative 3B will likely take longer to construct than Alternative 3A)

- Both Alternatives would be subject to lengthy community outreach process.

- Both Alternatives would impact portions of the Winthrop navigation channel (shown below) and would likely be unpermittable.

Proposed Full RSA Dimensions Within Ship Channel Vicinity



Source: McFarland Johnson, 2018
NOAA Office of Coast Survey

DRAWING LEGEND

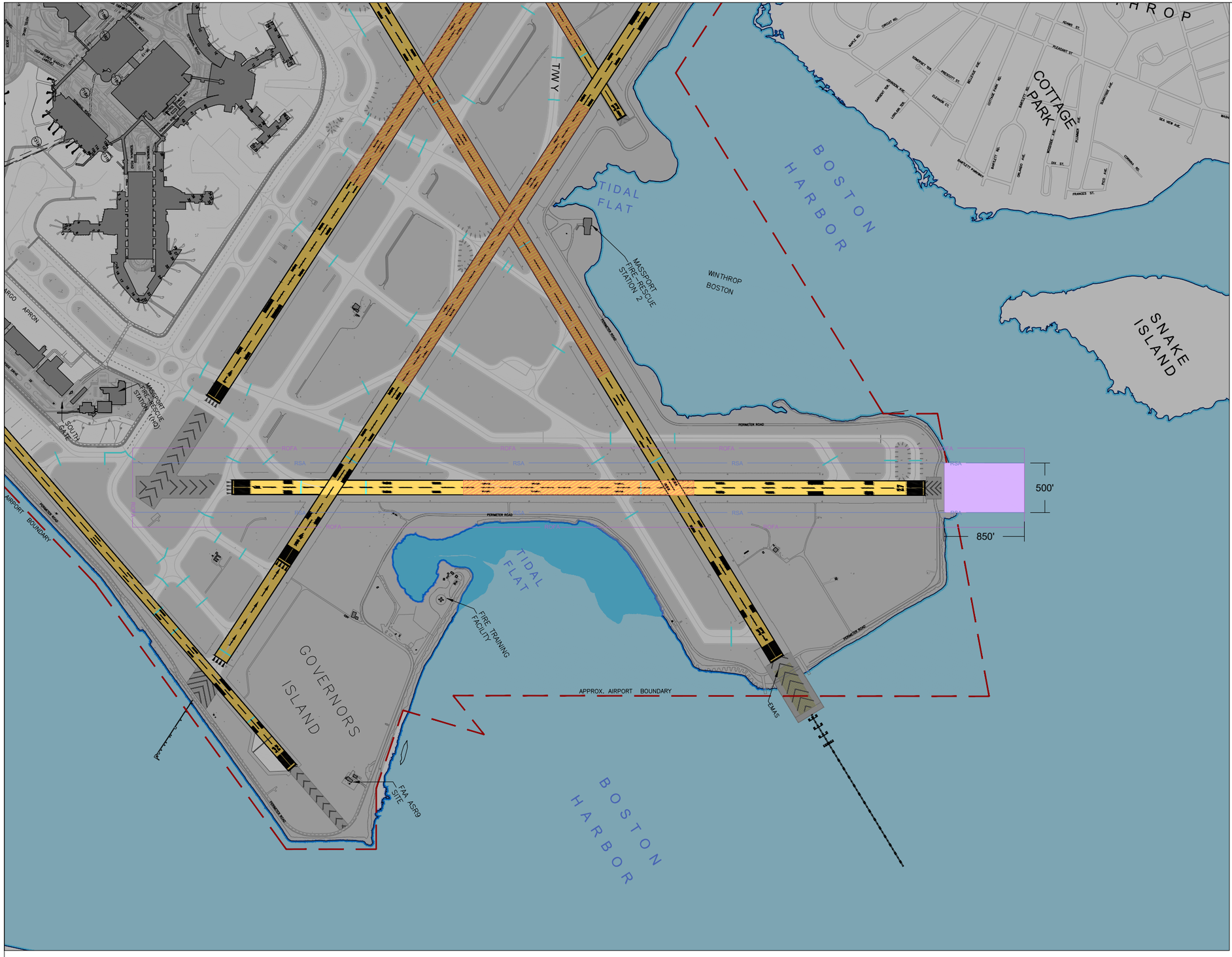
- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- ENGINEERED MATERIAL ARRESTING SYSTEM (EMAS)
- SHIP DETECTION RADAR
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL FULL DEPTH FILL
- POTENTIAL RIP RAP PERIMETER
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

DRAFT - NOT FOR PUBLIC DISSEMINATION

GRAPHIC SCALE IN FEET
0 400 800 1600

NORTH

EXHIBIT 1.3A
RUNWAY 9-27 RSA ALTERNATIVE 3A - FILL
DIMENSIONAL GAP ALTERNATIVES



DRAWING LEGEND

- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- ENGINEERED MATERIAL ARRESTING SYSTEM (EMAS)
- SHIP DETECTION RADAR
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL FULL DECK
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

DRAFT - NOT FOR PUBLIC DISSEMINATION

bostonlogan

GRAPHIC SCALE IN FEET
0 500 1000 2000

NORTH

EXHIBIT 1.3B
RUNWAY 9-27 RSA ALTERNATIVE 3B - FULL DECK
DIMENSIONAL GAP ALTERNATIVES

1.3.4 Alternatives 4A and 4B – Construct EMAS on Deck

As previously described, the FAA accepts an EMAS as providing an equivalent level of safety as provided by a full dimension (500' wide, 1,000' beyond runway end) RSA and does so in a shorter distance off the end of a runway. At BOS, the east end of Runway 9-27 is only 150' from Boston Harbor and while environmental issues might render it highly challenging and costly, EMAS has the potential of providing the requisite protection in the event of an overshoot or undershoot of a runway end, while minimizing to the extent practicable the impact to environmental features in Boston Harbor. Two sub-alternatives for Alternative 4 were considered, one for a full-width installation on a deck (4A) and one for a reduced width to 300' similar to the existing Runway 33L installation (4B). These alternatives are collectively discussed as "Alternative 4" in this section as the fundamental concept behind Alternative 4 is a standard EMAS bed.

EMAS Bed Length Considerations

The length of the EMAS bed is determined based upon the fleet mix of aircraft operating on the affiliated runway. The airport reference code as shown on the current BOS Airport Layout Plan (ALP) is D-V meaning that the airport is intended to accommodate the requirements of aircraft in approach category D (approach speeds of 141 knots but less than 166 knots) and airplane design group V (wingspans of at least 171' but less than 214'). A query of Runway 9-27 operations from calendar year 2017 identified that there were over 2,600 ADG V operations operating on the runway. This meets the definition for determining the critical aircraft grouping for a given runway as ADG V aircraft operations exceed 500 annual itinerant operations. It is expected that ADG V aircraft will continue to utilize Runway 9-27 with similar frequency in the future. The aircraft fleet mix to be used for EMAS design will be determined during the conceptual design and permitting process.

A review of Airbus and Boeing Planning Characteristics manuals for the Airbus A330, A340, and A350 along with the Boeing B777, B747 and B787 found that the noted aircraft models would incur significant load penalties on a 7,000-foot runway at sea level both on warmer days and on a 59-degree standard day, however, many of these aircraft are high-performance and are operating on relatively short stage lengths compared to their full range. Additionally, many ADG V aircraft operating on Runway 9-27 are arrivals that land on Runway 27. For purposes of this analysis, initial options have been based on accommodating a runway overrun by a B777 aircraft departing on Runway 9 or an undershoot of a B777 landing on Runway 27.

It is recognized that the size of the EMAS needed for this aircraft and either the fill pad or deck supporting the EMAS bed would be longer than that required for an ADG-IV or ADG-III aircraft, which comprise the vast majority of the aircraft using this runway. Thus, as impacts associated with development of the EMAS are identified, it is likely that the ultimate length of the facility may be less than that associated with an EMAS for a larger design aircraft.

FAA has developed EMAS length charts and incorporated these into Advisory Circular 150/5220.22B, Engineered Materials Arresting Systems for Aircraft Overruns, however these were prepared for only seven aircraft models and only to provide examples. The aircraft cited in Appendix 2 of the circular listed example aircraft as shown below in **Table 1.6.** While these provide an idea of EMAS lengths based on a 70-knot excursion speed, they cannot be used to accurately infer EMAS length requirements for other aircraft models. Defining the length of the required EMAS bed requires access to specific aircraft design data on the configuration and operational characteristics of the critical design aircraft that will operate on the runway. Unfortunately, this computer model is not publicly available and limits the ability to fully analyze the EMAS requirements for most aircraft.

Table 1.6 - Representative EMAS Bed Length by Aircraft Type

Aircraft	Design Group	Gross Weight (lbs.)	Landing Gear Configuration	EMAS Bed Length
CRJ 200	II	53,000	Dual Wheel	325 feet
Gulfstream G-III	II	67,700	Dual Wheel	425 feet
Douglas DC-9	III	114,000	Dual Wheel	375 feet
Boeing 737-400	III	150,000	Dual Wheel	390 feet
Boeing 757-200	IV	255,000	Double Dual Tandem Wheel	450 feet
Douglas DC-10	IV	455,000	Double Dual Tandem Wheel	520 feet
Boeing 747	V	875,000	Quad Double Dual Tandem Wheel	575 feet

Source: Advisory Circular 150/5220.22B, Aircraft Planning Characteristics Manuals.

Given the inability to define the exact length of EMAS bed for an aircraft other than those above, it was decided to use the same EMAS configuration constructed on the approach end of Runway 33L. The Runway 33L EMAS was constructed based on the requirements for the aircraft fleet mix proposed to use the runway, including the B747-400, and was built to provide for both overrun and undershoot protection. While it is possible that the length of this facility could be more than required for aircraft operating on Runway 27, this cannot be fully verified without access to the computer model. The value of using the Runway 33L EMAS as a conceptual template for analysis is that it represents a completed EMAS concept constructed at BOS proximate to the Runway 27 end that was planned taking into consideration the specific environmental factors, operational considerations, construction techniques and regulatory interpretations that were addressed as a part of the Runway 33L EMAS program and, as such, provides an excellent foundation for understanding the realities that an EMAS on Runway 9-27 would have to consider.

At the time that the Runway 33L EMAS was being considered, FAA criteria indicated that EMAS was adequate for addressing the RSA length requirement but did not provide a basis for a reduction in the required width of a RSA. The FAA and Massport, after consideration of the potential cost and impact of providing the full width for a Runway 33L RSA, worked together to reduce the width of the Runway 33L EMAS deck from the required 500' to a width of 306' (300' wide deck plus an additional 6' for safety rails). A reduction below 300' was not accepted due to the need to provide adequate room adjacent to the EMAS bed for the maneuvering of emergency vehicles in the event of an incident and for construction equipment should the bed require repair.

The final lengths of the Runway 33L EMAS are approximately 600' for the Setback and EMAS bed and 50' for emergency and maintenance vehicle access for a total length of 650' from the runway threshold to the end of the deck. The 600' corresponds to the FAA minimum RSA length for undershoot purposes and the RSA cannot be less than this length independent of the EMAS requirements.

Based on the usage of the Runway 33L EMAS as a prototype EMAS for evaluation purposes, the proposed improvements that would occur on the east end of Runway 9-27 are depicted in **Exhibit 1.4(A)** and **Exhibit 1.4(B).** Exhibit 1.4(A) depicts the EMAS installation on a 500'-wide deck, and Exhibit 1.4(B) depicts an EMAS installation on a 300'-wide deck. These improvements provide the requisite protection for the required 600' of undershoot RSA and would fully address the ability to stop a 70-knot overrun consistent with the design requirements for a standard EMAS.

Alternative 4A and 4B Elements

- A proposed deck structure commencing 150' east of the Runway 27 threshold and extending 500' feet to the east, maintaining a width of 500 for Alternative 4A or 300 feet for Alternative 4B.[15] This provides a surface area of approximately 150,000 for Alternative 4A or 250,000 square feet for Alternative 4B. The structure provides area for the EMAS bed and for access to all sides of the EMAS bed for emergency vehicles and responders. The proposed deck would be supported by pilings similar to the configuration used in the construction of the Runway 33L RSA.

- An EMAS bed of approximately 500' in length by 170' in width beyond the east end of the runway along the extended runway centerline would be constructed beginning after the setback distance as determined during the EMAS design (50' assumed in this study).

[15] Based on clarification of criteria provided by the FAA New England Region, a standard EMAS mitigates both the length and width requirements of a full dimension RSA.

This Page Intentionally Left Blank.

DRAWING LEGEND

- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- ENGINEERED MATERIAL ARRESTING SYSTEM (EMAS)
- SHIP DETECTION RADAR
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL ENGINEERED MATERIALS ARRESTING SYSTEM (EMAS)
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

BOSTON HARBOR
TIDAL FLAT
WINTHROP BOSTON
MASSPORT FIRE-RESCUE STATION 2
MASSPORT FIRE-RESCUE STATION 1 (HQ)
PERIMETER ROAD
RSA
ROFA
500'
650'
TIDAL FLAT
FIRE TRAINING FACILITY
GOVERNORS ISLAND
APPROX. AIRPORT BOUNDARY
EMAS
FAA ASR9 SITE
BOSTON HARBOR

GRAPHIC SCALE IN FEET
0 400 800 1600

NORTH

DRAFT - NOT FOR PUBLIC DISSEMINATION

EXHIBIT 1.4A

RUNWAY 9-27 RSA ALTERNATIVE 4A - EMAS

DIMENSIONAL GAP ALTERNATIVES

DRAWING LEGEND

- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- ENGINEERED MATERIAL ARRESTING SYSTEM (EMAS)
- SHIP DETECTION RADAR
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL ENGINEERED MATERIALS ARRESTING SYSTEM (EMAS)
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

bostonlogan

GRAPHIC SCALE IN FEET
0 400 800 1600

NORTH

EXHIBIT 1.4B

RUNWAY 9-27 RSA ALTERNATIVE 4B - EMAS

DIMENSIONAL GAP ALTERNATIVES

- A relocated secure airport perimeter roadway crossing between the Runway 27 end of runway and the beginning of the EMAS bed. This roadway would require installation of stop signs prior to entering the Runway Object Free Area and active communication with the ATCT for permission to enter runway protected areas and cross the runway alignment.

- If the FAA were to require relocation of the Perimeter Roadway to lie outside of the Runway 9-27 ROFA, a separate bridge structure approximately 1,765 feet in length extending over the harbor would be required to keep the roadway outside of both the ROFA and the RSA.

Alternatives 4A and 4B incorporate assumptions based on analysis and decisions made during the Runway 33L EMAS development program and environmental overview. It also provides a standard EMAS which meets the requirements for a safety area for the east end of Runway 9-27 while reducing, to the extent practicable, impacts to the environmental resources along the shoreline and in the waters of Boston Harbor, and to navigation within the harbor and to adjacent communities.

The attributes and the constraints/limitations of Alternative 4 are outlined below.

Attributes of Alternatives 4A and 4B

Alternative 4 has the benefit of being informed by the construction of a similar RSA improvement on the Runway 33L end, and incorporates assumptions based on analyses undertaken, and decisions made during the Runway 33L EMAS development program and environmental overview. Alternative 4 provides a standard EMAS which meets the requirements for a RSA on the east end of Runway 9-27 and does so while reducing, to the extent practicable, impacts to environmental resources along the shoreline and in the waters of Boston Harbor. Additional attributes include the following:

- Provides for both undershoot and overrun RSA protection consistent with what was previously implemented on Runway 33L.

- Development of EMAS RSA improvements have a strong aviation safety basis that is supported by significant research defining the rationale for the need for safety areas and a history at airports nationwide of incidents supporting the need for the RSA.

- Utilizes a deck and pile-supported structure, rather than a solid fill structure reducing direct impacts to coastal wetlands and environmental resources compared to impacts associated with a fill option.

- Would have less impact on the navigational channel than a full-length RSA.

Constraints of Alternative 4A and 4B

- It is reasonable to expect adverse community response to the proposed construction activities off the end the Runway 27 end of the runway.
- Would require an extensive environmental impact review process due to impacts to coastal bank / intertidal flats, shellfish habitat, subtidal areas, terrestrial and marine threatened and endangered species, flood plains, and tidelands. The impacts would be the less than for Alternatives 3A and 3B. Alternative 4B would have fewer impacts than Alternative 4A.
- Current uncertainty about the availability of EMAS bed materials given the cessation of manufacture of EMAS blocks by EMASMAX, and an agreement between Zodiac, Runway Safe and FAA that precludes Runway Safe from installing their EMAS product until 2021.
- Would impact portions of the Winthrop navigation channel but would likely be permittable.

1.3.5 Runway 9-27 Alternative 5 - No-Action Alternative

This alternative would retain existing conditions based on the rationale set forth in the FAA's 2004 Runway Safety Area Determination and not implement any improvements to reduce the extent of the non-standard condition or remove the condition entirely. This would retain the existing RSA dimensions which are 500 feet wide and 150 feet in length beyond the east end of Runway 9-27. According to the FAA, RSA standards cannot be modified or waived and a continuous evaluation of all practicable alternatives for improving RSA conformity are required. The No-Action/No-Build Alternative, depicted in **Exhibit 1.5**, assumes that Runway 27 enhancements would not occur and routine maintenance at the airport would continue.

Although the No-Action alternative does not have any environmental impacts due to construction, this alternative does not provide adequate safety area to prevent, in case of an aircraft undershoot or overrun, the aircraft from entering the harbor. A plane crash in the harbor would have a large negative impact on virtually all the regulated resources.

DRAWING LEGEND

- RUNWAY PAVEMENT
- HIGH ENERGY RUNWAY AREA
- TAXIWAY/APRON PAVEMENT
- BUILDING
- WATER
- ILS HOLDBAR
- HOLDBAR
- POTENTIAL DISPLACED THRESHOLD
- POTENTIAL PAVEMENT PAINTING
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)

EXISTING RUNWAY 9 DECLARED DISTANCES

TORA, TODA, ASDA, LDA- 7,000'

1,000'

500'

150'

TORA, TODA, ASDA, LDA - 7,000'

EXISTING RUNWAY 27 DECLARED DISTANCES

TIDAL FLAT

BOSTON HARBOR

WINTHROP BOSTON

MASSPORT FIRE–RESCUE STATION 2

MASSPORT FIRE–RESCUE STATION 1 (HQ)

GOVERNORS ISLAND

FIRE TRAINING FACILITY

FAA ASR9 SITE

APPROX. AIRPORT BOUNDARY

EMAS

PERIMETER ROAD

TERMINAL ROAD

BARTLETT PARKWAY

BARTLETT RD.

ORLANDO AVE.

ROSSIDE AVE.

ROFA

RSA

DRAFT - NOT FOR PUBLIC DISSEMINATION

bostonlogan

GRAPHIC SCALE IN FEET

0 400 800 1600

NORTH

EXHIBIT 1.5

RUNWAY 9-27 RSA ALTERNATIVE 5 - NO ACTION

DIMENSIONAL GAP ALTERNATIVES

This Page Intentionally Left Blank.

1.4 Preferred Alternative

The preceding sections have described several alternatives to address the RSA deviations from design standards for Runway 9-27. Based on consideration of these alternatives and their attributes and constraints, the preferred alternative for the resolution of RSA deficiencies on Runway 9-27 is the implementation of **Alternative 4B – EMAS on a 300'-wide deck** (the actual width of the deck would be 306' to allow for safety rails). This alternative is preferred as it will provide the highest level of aircraft safety without reducing the operational capability of the BOS airfield while also minimizing environmental impacts from additional construction in the harbor.

This preferred alternative recognizes the fact that EMAS is not currently available until at least 2021, pending the planned sunset of a legal agreement between EMASMAX and the FAA on the sales of the RunwaySafe EMAS system in the United States. However, considering this reality, all indications from FAA and airport industry resources have been that an EMAS system will be available once the legal agreement sunsets. The availability of the EMAS system will likely coincide with the completion of the estimated 2 to 3 year permitting process required for the EMAS deck (see below). This alternative closely follows the previously adopted mitigation for Runway 33L.

Considerations

Alternative 1 is not preferred as it would result in a reduction in the operational capability of Runway 9-27 such that many aircraft would require weight penalties for departures on Runway 9 with a reduction in ASDA to approximately 6,150'. The resulting reduction in LDA on Runway 27 would also likely pose impact to runway occupancy time and airfield capacity through the reduction of rollout distance available to the existing Taxiway E exit point.

Alternative 2 was also considered as a near-term incremental improvement in order to gain an RSA beyond the departure end of Runway 9 in advance of implementing an EMAS system by creating a displaced threshold and shifting the start end of Runway 9 takeoffs approximately 195 feet to the west. However, this improvement would require an estimated two to three-year court review process due to existing injunction agreements for Runway 9 which could delay the implementation of this improvement such that it could ultimately nearly coincide with the implementation of the recommended alternative. It should be noted that the improvements described in Alternative 2 are still being considered as part of the overall RIM geometric alternatives for this study to mitigate an existing aligned taxiway at Runway 9.

Alternative 3A is not preferred due to the likely high environmental impact and required habitat and species mitigation from the fill of the harbor. Both Alternative 3A and 3B are not preferred because their impacts to the adjacent navigation channel are unlikely to be permittable.

Environmental Review and Permitting for the Preferred Alternative

Alternative 4B will result in construction on upland and in the marine environment. A brief overview of the environmental review and permitting process is outlined below:

Federal Approvals and Permits

- NEPA – Likely an EA and FONSI
- US Army Corps of Engineers Section 10 (Navigable Waterways)
    - National Marine Fisheries – Protected Species Assessment, Essential Fish Habitat Assessment, and Marine Mammal Assessment
- US Army Corps of Engineers Section 404 (Wetlands)
- Coastal Zone Management (CZM) – Determination

State and Local Approvals and Permits

- MEPA – ENF and Likely Draft and Final EIR
- MA Wetlands Protection Act (via Boston Cons. Comm. and MassDEP)
- Water Quality Certificate (MassDEP 401 WQC)
- Chapter 91 (Structures Below Mean High Tide) (MassDEP)
- Mass. Endangered Species Act – Possible Conservation Permit

It is anticipated that the environmental review and approval process would take 1 ½ to 2 years for the NEPA/MEPA review and another 1 ½ to 2 years for permitting, for a total of 3 to 4 years.

Appendix C- Agency Correspondence

This Page Intentionally Left Blank

Appendix C.1- Massachusetts Division of Marine Fisheries

This Page Intentionally Left Blank

Runway 27 End RSA Improvements Project
Boston Logan International Airport
East Boston, Massachusetts

Meeting Notes

Date and Time:	May 4, 2022, at 1:30 PM	Notes Taken By:	Kristen Bergassi/VHB
Place:	Online Meeting via Zoom		
Project No.:	14792.02	Re:	Runway 27 End RSA Improvements Project Massachusetts Division of Marine Fisheries Coordination

ATTENDEES:

Sarah Dennechuk, Massport	Stewart Dalzell, Massport	Brad Washburn, Massport
Greg Bettencourt, DMF	Jeff Kennedy, DMF	Forest Schenck, DMF
Kristen Bergassi, VHB	Gene Crouch, VHB	

Summary

The purpose of this meeting was to review Massport's Runway 27 End Runway Safety Area (RSA) Improvements Project (the Project) at Logan Airport with the Massachusetts Division of Marine Fisheries (DMF). Massport is continuing coordination in accordance with the Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs' (EEA) Certificate on the Environmental Notification Form. Coordination includes discussion of the Project's location within Boston Harbor, its associated permanent and construction period impacts, and minimization, avoidance, and mitigation to reduce impact to the DMF's interests and resources. An interagency briefing was hosted by Massport on February 23, 2021. The DMF, through this coordination, was briefed on the extent of this Project at that meeting, and DMF provided recommendations in advance of the June 2022 filing of the Draft Environmental Impact Report (DEIR). The construction impacts and commitments section of the DEIR will reflect the time-of-year (TOY) restriction for Winter Flounder, include double silt curtains, and expedite pile-driving activities to the greatest extent practicable. The DMF representatives at this meeting were Forest Schenck (Environmental Review), Greg Bettencourt (Regional Shellfish Biologist), and Jeff Kennedy (Shellfish Program Manager).

Discussion

- S. Dalzell, Massport project permitting lead, provided a project overview.
- At the Runway 27 End, Massport's preference would be to follow procedures used at the adjacent Runway 33L RSA which adhered to the Winter Flounder TOY restriction (February 15 to June 30).
- Turbidity curtains were used during improvements made to the Runway 33L RSA area. With use of turbidity curtains, adding the soft-shell clam TOY restriction (July 1 to November 15) would substantially limit the window available for construction.
- Once piles start going in for the Runway 27 deck support, the Contractor can start using turbidity curtains. Higher grade turbidity curtain material could be used to prevent deployment issues.

› Shellfish soft-shell clams

- DMF considers this area prime soft shell clam habitat. Recently, there have been juvenile sets of soft-shell clams. Most have not successfully matured to suitable harvesting size due to a harbor-wide disease affecting the clams.
- Work should be focused during low or outgoing tide.
- DMF prefers implementation of silt curtains.
- The preferred alternative has 312 piles that are 20-square inches diameter. Some piles would be constructed along the shoreline, some in the water. Dredging and backfilling are not proposed under this project. Piles will be vibrated in, rather than driven in as much as possible, which reduces impacts from sedimentation.
- DMF believes the level of turbidity could be detrimental to the soft-shell clams. G. Bettencourt does not know if there is an established turbidity impact threshold. G. Crouch believes the activities would not be detrimental to the soft-shell clams.

› Scour and sedimentation

- G. Crouch discussed the outcomes of the scour analysis that was done as a part of the coastal analysis. Results showed there is little to no scour anticipated because of the Project.
- F. Schenck asked if we can we quantify the siltation in and out of the curtains? G. Crouch noted this would require sampling in and out of the turbidity curtains, which is not currently programmed.
- Using coffer dams may be difficult. G. Crouch has not seen that used in other similar projects.
- B. Washburn shared pictures of the tidal conditions. The Project site has less exposure than the prior RSA project (Runway 33L), which may make erosion less of an issue.

› Construction impacts

- The bigger pre-cast structural beams will require multiple cranes at once.
- DMF wants to minimize impacts to fisheries.
- At Runway 4R, turbidity monitoring during pile installation did not measure turbidity over 10 NTUs (Nephelometric Turbidity Units). Turbidity curtains were employed.
- S. Dennechuk – Construction would be working within noise time of day limitations. Construction of the preferred alternative is estimated at approximately 120 days total in or on water and will need to be staged to demobilize quickly for weather conditions and operational flexibility.
- Massport has not received many requests for shellfishing at Logan Airport recently. DMF noted the shellfishers have spread out across available grounds. G. Bettencourt wants to see if there are any harvestable soft-shell clams near Wood Island as they have experienced some die off.
- The DEIR will need to reflect TOY restrictions and siltation curtains.

The DEIR will reflect the TOY restriction for only Winter Flounder, include double silt curtains, have pile driving activities expedited over one season, and turbidity monitoring during construction.

Appendix C.2- U.S. Coast Guard

This Page Intentionally Left Blank

Runway 27 End RSA Improvements Project
Boston Logan International Airport
East Boston, Massachusetts

Meeting Notes

Date and Time:	May 9, 2022, at 11:00 AM	Notes Taken By:	Kristen Bergassi/VHB
Place:	Online Meeting via Zoom		
Project No.:	14792.00	Re:	Runway 27 End RSA Improvements Project U.S. Coast Guard (USCG) Coordination

ATTENDEES:

Timothy Chase, USCG	Sarah Dennechuk, Massport	Stewart Dalzell, Massport
Brad Washburn, Massport	Gene Crouch, VHB	Kristen Bergassi, VHB

Summary

The purpose of this meeting was to review Massport's Runway 27 End RSA Improvements Project (the Project) occurring at Logan Airport with the U.S. Coast Guard (USCG). This coordination is taking place as directed by the Secretary of Energy and Environmental Affairs' (EEA) Certificate on the Environmental Notification Form to discuss the Project's location within Boston Harbor, its associated permanent and construction period impacts, and minimization, avoidance, and mitigation (if required) to reduce impact to the USCG's interests and resources. The USCG through this coordination has been briefed on the extent of this Project and have provided recommendations to assist in the progression of the Project as the Draft Environmental Impact Report (DEIR) is prepared. As a result of this coordination, the USCG does not have any immediate questions or concerns with this Project.

Notes

- S. Dalzell and T. Chase provided an introduction of meeting attendees.
- S. Dalzell noted the purpose of the meeting was to brief USCG of the project in advance of the DEIR filing in late June 2022, and future National Environmental Policy Act (NEPA) Environmental Assessment anticipated for the Federal Aviation Administration (FAA) environmental review process.
- S. Dalzell provided a project overview and showed proposed graphics of the Project Site and navigational channel. The Runway 27 End is closer to the navigation channel than Runway 33L. For this Project, there is no extended light pier.
  - The navigation chart shows the Massport buoyed area security zone.
  - All direct work will occur within the City of Boston, with some temporary maneuvering of barges through a portion of the navigational channel in Winthrop during construction. Massport would notify USCG during construction in these instances.
  - Massport has identified a sheltered safety area away from the navigation channel to relocate water-based construction equipment in event of heavy weather. The USCG agrees this is a good approach.

- Security zone and lighting
  - All meeting attendees agreed the existing buoy at 250-foot security zone within the project footprint will need to be relocated.
    USCG recommends a change or relocation of the existing white flashing light buoy and suggests adding another white flashing light buoy.
  - S. Dennechuk will check within Massport to confirm which ones are blinking.
  - USCG will update local mariners ahead of construction period. There is little concern for impacts to local mariners, as the navigation channel is wide in vicinity of the Project Site.
  - For lights at the end of the new deck structure, USCG prefers no flashing, or red or green lights.
  - As design proceeds, Massport will work with the FAA to figure out best type of lights for aviation purposes. The goal is to keep boaters away from deck, not attract them to the deck.
- Permits
  - Section 10 and Section 404 U.S. Army Corps of Engineers (USACE) permits will be required.
  - Additional permitting may be needed for docks, piles, and sheet piles. Massport will work with the USACE to confirm. No disposal activities are proposed for this Project. Paul Sneeringer (USACE) is the current contact for permitting coordination.
- USCG will notify Massachusetts Department of Environmental Protection (MassDEP) operators, mariners, equipment, and Port Operators Group (POG) in June/July 2022.
- The construction period for the Project is anticipated for 2025-2026.
- USCG does not see any issues with this project.
- There is a new Winthrop Harbormaster. T. Chase volunteered to brief him on the Project (Massport will provide slides from today's meeting to assist in that coordination).
- Once available, the USCG asked Massport to provide a list of construction requirements the contractor will adhere to, including number of tugs (hours of work, name operator, phone), cranes, and safety zone.
- Massport does not see much mariner traffic around the Project Site and does not believe a safety zone is needed. The bulk of construction would occur during daylight hours. Time-of-year (TOY) restrictions for Winter Flounder will be used as recommended by the Division of Marine Fisheries. Currently, Massport is assuming two 60-day construction windows, one each in 2025 and 2026.

Appendix C.3- National Oceanic and Atmospheric Administration

This Page Intentionally Left Blank.

Meeting Notes

Date:	May 27, 2022	Notes Taken By:	Kristen Bergassi/VHB
Place:	Online Meeting via Zoom	Re:	Logan Airport Runway 27 End Runway Safety Area Improvements Project, Essential Fish Habitat Discussion with NOAA
Project No.:	14792.00		

ATTENDEES:
Stewart Dalzell, Massport
Gene Crouch, VHB
Kaitlyn Shaw, NOAA
Kristen Bergassi, VHB
Joe Choi, WSP

Summary

The purpose of this call was to brief the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service (NOAA Fisheries) prior to the finalization of the Runway 27 End Runway Safety Area (RSA) Draft Environmental Impact Report (DEIR) and prior to filing with the Massachusetts Environmental Policy Act (MEPA) Office at the end of June 2022. The National Environmental Policy Act (NEPA) review will be conducted by FAA in the next document.

Notes

- S. Dalzell provided K. Shaw of NOAA Fisheries an introduction of RSAs and a project overview of the Runway 27 End RSA Improvements Project.
  - Total pile impact area proposed for the project within coastal zone is approximately 850 sq ft.
  - Numbers of soft shell clams have substantially reduced due to shellfish disease. Shellfish mitigation will consist of in-lieu fee for soft shell clam and shellfish habitat restoration with the Massachusetts Division of Marine Fisheries (DMF).
  - Objective is to balance natural and wildlife habitat needs while protecting human safety/aircraft hazards.
  - Massport has coordinated with the U.S. Coast Guard (USCG), who had no preliminary concerns.
  - Shellfish diggers are legally allowed to harvest in this area.
- Intertidal areas below crushed stone to the mean lower low water (MLLW) line are of most interest to NOAA, intertidal and mudflats. Add MLLW line to graphics. NOAA is not as concerned about area modified with crushed stone.
- FAA will lead the NEPA effort for proposed changes to the Airport Layout Plan. FAA has not made a final Class of Action determination, but Massport anticipates an Environmental Assessment (EA). Massport is coordinating with the U.S. Army Corps of Engineers (USACE).
- The Final Environmental Impact Report (FEIR) is expected to be a joint document with the Draft EA. A draft Finding of No Significant Impact (FONSI) would be prepared as part of that document.

- The lead federal agency during Essential Fish Habitat (EFH) consultation may designate Massport as the coordination agency. K. Shaw confirmed during the call that Massport is approved to represent federal lead agency during EFH consultation.
- G. Crouch presented the Runway 33L example deck and showed where existing crushed stone areas/disturbance limits are located, and the emergency egress ramps.
- G. Crouch described the Benthic survey, Shellfish survey, and Mussel beds survey conducted, which revealed greatly reduced populations in this area than what was identified in Runway 33L. After construction, monitoring conducted during Runway 33L showed mussels benefited from the RSA installation.
- For Runway 33L, no targeted sampling or monitoring was done for winter flounder habitat. Massport has previously mapped eelgrass on this side of the Airport, but recent surveys confirmed it is not present within the project area.
- G. Crouch to provide Runway 33L monitoring report to NOAA Fisheries. Many polychaetes and amphipods were seen, and mysids observed in the water column. Winter flounder were seen during the eelgrass survey. Due to this, Massport will incorporate the time-of-year (TOY) restriction in the construction period. Project Team considered and evaluated multiple alternatives for this deck. The selected alternative - quickest amount of construction time and least impactful (fewest number of piles), least expensive.
- The Project area is flat then drops off quickly before flattening again. "Mud flat" was identified as special aquatic site for USACE documentation.
- K. Shaw inquired about the plan for disposing the existing plastic grid at the runway end in terms of reducing "microplastics."
  - S. Dalzell to discuss this internally at Massport, and report back to NOAA. Some of it will be replaced by ramps that will have riprap protections and bulkhead with stone.
- NOAA would like to see calculations and graphics from the high tide water line to the mean lower low water line. Page II should update the summary sections in table for mud flats and intertidal flats (updated in the Final EIR).
- K. Shaw will connect Massport with Roosevelt Mesa to confirm Section 7 documentation for other protected species. She assumed the programmatic form would be required.
- If Massport cannot meet TOY restriction (preference), NOAA recommends dewater and install coffer dams prior to construction. S. Dalzell noted Massport has accepted the TOY restriction (less impactful to habitat and airfield operations), and Massport will deploy turbidity curtains outside of TOY restriction during construction. Construction will occur in 2025-2026.
- K. Shaw will review EFH letter example from Runway 33L.

Appendix C.4- Shellfishers and Massachusetts Division of Marine Fisheries

This Page Intentionally Left Blank

Runway 27 End RSA Improvements Project
Boston Logan International Airport
East Boston, Massachusetts

MEETING MINUTES

Project Name:	Logan International Airport – Runway 27 End Runway Safety Area (RSA) Improvements
Project Number:	MPA L1633
Place Held:	Online Meeting via Zoom
Date:	June 2, 2022
Written By:	Joseph Choi
Subject:	Meeting with Shellfishers and Massachusetts DMF
Attendees:	Massachusetts Port Authority (Massport): Stewart Dalzell Massachusetts Division of Marine Fisheries (DMF): Jeff Kennedy, Greg Bettencourt Shellfishers: Bob Stanley, Paul Cereno, Chris Crafton WSP: Amanda DeCesare, Joseph Choi VHB: Kristen Bergassi, Gene Crouch

Summary of Discussion Topics and Comments

Project Overview and Scope Progress

S. Dalzell presented an overview of the project, describing that it will comprise a pile-supported deck like Runway 33L. It is anticipated that the piles will be concrete and there will be fill behind a bulkhead where the cobbles and riprap are currently. For the shellfishers' benefit, J. Kennedy of DMF explained that the project is in Clam Flat area GBH5.2 just south of the former Boat Safety Shack (aka "Candy Shack"). G. Crouch of VHB stated that the deck will be supported on 326 concrete piles, 240 of the piles fall within 'Land Under Ocean' area and 125 piles in the area of clam flats at the lowest of low water. The mud surface in this area is extremely soft.

Questions and Answers

The following questions, statements, and answers were discussed:

- How big around are the pilings? Answer: They are expected to be 20-inch square (G. Crouch).
- Can we dig around the piles? Answer: Yes (G. Crouch).
- Can you get a boat under the deck? Answer: Shellfishers will have the same access at Runway 27 as they do at Runway 33L (S. Dalzell). It was later restated by shellfisher P. Cereno that they are not allowed to go under the pier and that they are required to go around. Massport will look to confirm any restrictions.
- Are shellfishers allowed to under the deck? Answer: Massport to follow-up on access under the pier (Action – S. Dalzell).
- How much of the clam flats will be lost? Answer: Total area of lost seabed is approximately 350 square feet (G. Crouch).

- How wide is the mud flat area at MLW? Answer: From MLW, it's about 100 feet wide at extreme low tides (EL. -8 feet MLW). Beyond that point it drops off to EL. -23 feet MLW (G. Crouch). At more typical low tides (EL. -5 feet MLW) the mud flat area was closer to 25 feet wide (S. Dalzell).
- Would the state be able to provide compensation at other locations such as Belle Isle or Thompson Island? Answer: DMF stated that clamming can take place on Thompson Island now. Belle Isle and Carson Beach locations are currently closed and would require environmental and sanitary evaluations (G. Bettencourt). As part of the environmental permitting process for mitigation, Massport will be asked for funding for the DMF restoration program like in the past. Massport expects that DMF will receive compensation for the loss of shellfish habitat (S. Dalzell).
- The shellfishers stated that the reseeding at Thompson Island didn't work and that the last time the nets were dug, there were minimal clams. DMF responded that there were two mitigation proposals in the past that performed reseeding and acknowledged that the reseeding had mixed results and that the clam neoplasia disease and predators are impacting the clam growth (J. Kennedy).
- P. Cereno stated that the project site area once was one of the most productive clam flats. DMF Responded that GBH5, the area north of the project site at the "Candy Shack" is the most productive habitat. J. Kennedy of DMF noted that the area at Runway 27 has higher currents and the spat doesn't settle out as easy therefore the clam growth around the project site is much less productive. G. Bettencourt stated that it's possible that the piles may slow down the current allowing the spat to settle.
- The shellfishers asked if there will be additional meetings related to the development of this project before construction begins? Construction is slated to start in 2025. Massport is working on the state environmental report and as part of the process there will be another public meeting. Then in another year or so there will be number of individual permits developed so there will be additional opportunities for public comment during that process as well. Through these meetings, Massport will be developing the best methods for construction and remediation to minimize the environmental impacts. S. Dalzell stated that this is the first of such meetings and Massport will continue to keep the shellfishers and DMF informed.

Action Items

1) S. Dalzell of MPA to follow-up on whether shellfishers are allowed under the pier decks.

These minutes represent the author's understanding of the discussion that occurred at the above referenced meeting. Comments, corrections, revisions, or amendments will be accepted in writing within three (3) business days of receipt of these minutes. Upon receipt of comments, revised meeting minutes will be issued; absent of comments, these minutes will be deemed the final record of the subject meeting.

Appendix C.5- Interagency Meeting

This Page Intentionally Left Blank

Runway 27 End RSA Improvements Project
Boston Logan International Airport
East Boston, Massachusetts

Meeting Notes

Date and Time:	June 6, 2022, at 9:00 AM	Notes Taken By:	Kristen Bergassi/VHB
Place:	Online Meeting via Zoom		
Project No.:	14792.00	Re:	Logan 9/27 Runway Safety Area Interagency Meeting

ATTENDEES:

Sarah Dennechuk, Massport	Stewart Dalzell, Massport	Brad Washburn, Massport
Kaitlyn Shaw, NOAA Fisheries	Daniel Padien, MassDEP Chapter 91	David Wong, MassDEP
Forest Schenck, DMF	Greg Bettencourt, DMF	Nicholas Moreno, BCC
Katherine Oetheimer, BCC	Amy Hoenig, NHESP	Rachel Croy, USEPA
Phil Colarusso, USEPA	Ed Reiner, USEPA	Joanna Yelen, CZM
Amanda DeCesare, WSP	Marla Engel, WSP	Joe Choi, WSP
Kristen Bergassi, VHB	Gene Crouch, VHB	

Summary

The purpose of this meeting was to review the proposed Runway 27 End Runway Safety Area (RSA) Improvements Project (the Project) at Logan Airport with the following agencies:

- National Oceanic and Atmospheric Administration (NOAA) Fisheries Service
- U.S. Environmental Protection Agency (USEPA)
- National Heritage and Endangered Species Program (NHESP)
- Massachusetts Department of Environmental Protection (MassDEP)
- Massachusetts Division of Marine Fisheries (DMF)
- Massachusetts Office of Coastal Zone Management (CZM)
- Boston Conservation Commission (BCC)

This coordination is taking place as directed by the Secretary of Energy and Environmental Affairs' (EEA) Certificate on the Environmental Notification Form to discuss the Project's location within Boston Harbor, its associated permanent and construction period impacts, and minimization, avoidance, and mitigation to reduce impact to the different agencies interests and resources. Agencies through this coordination have been briefed on the extent of this Project and have provided recommendations to assist in the progression of the Project as the Draft Environmental Impact Report (DEIR) is prepared.

Discussion

- S. Dalzell provided the following overview of the meeting and Project for the participants. It is important to note that this Project is comparable to past RSA projects at Logan Airport, such as the Engineered Material Arresting System (EMAS) installation in 2004-2005 at the Runway 22R End and in 2012 at the Runway 33L End.
- Project Purpose
  - Increase safety for aircraft and their passengers in emergency situations by enhancing the Runway 27 End safety area consistent with FAA requirements.
- Background
  - The Runway 27 End was last enhanced in 1992 with the construction of an Inclined Safety Area (ISA). While the ISA enhanced safety, it pre-dated the technologies that now allow adherence to FAA safety standards while minimizing environmental impacts.
- Existing RSA Conditions
  - The east end of Runway 9-27 does not meet FAA RSA design standards for undershoot or overrun protection. The existing ISA is 500-feet wide with a length of 150-feet along the centerline.
  - Standard FAA RSA length requirements are 1,000 feet for overrun protection and 600 feet for undershoot protection.
- Six alternatives were evaluated by FAA and Massport to bring the Runway 27 End RSA into compliance with current FAA RSA standards:
  - Alternative 1 - Declared Distances
  - Alternative 2 - Displaced Threshold Markings
  - Alternative 3A - Full RSA in Boston Harbor – Fill Option
  - Alternative 3B - Full RSA in Boston Harbor – Deck Option
  - Alternative 4A - EMAS on 500-Foot-Wide Deck
    - EMAS has been accepted by the FAA to reduce the RSA length[1]
  - Alternative 4B - EMAS on 306-Foot-Wide Deck (Preferred Alternative)
  - No Action Alternative
    - The No Action Alternative would retain existing conditions at the Runway 27 End. The No Action Alternative was dismissed by FAA because it does not meet RSA design criteria.

1 An EMAS is a bed of energy-absorbing material; in an emergency, if an aircraft rolls onto the EMAS, it is slowed down in a way that minimizes damage to the aircraft and potential injuries. An EMAS is often used when a full-dimension RSA is not possible due to lack of available land or to minimize environmental impacts; an EMAS provides an FAA-approved level of safety equivalent to an RSA built to the full-length dimensions.

› **Runway 27 End Runway Safety Area Environmental Resource Areas**

› Eelgrass Survey

- S. Dalzell noted no eelgrass was found this location. Massport to provide video, with notes from those surveys.
- P. Colarusso noted the eelgrass bed at Runway 33L has substantially reduced. He would like to see the eelgrass survey video from June 2021. Construction blasting noise from Presidents' Road (by others) may have impacted eelgrass.
- S. Dennechuk to check within Massport for any data from those activities.

› Pile Support Alternatives Screening

- The Preferred Alternative (4B) was identified by FAA as part of the RIM study. For this option, Massport evaluated four different deck support alternatives to determine the least impactful options in terms of environmental impacts and constructability.
- Wave detection monitors were deployed as part of the project coastal analyses required. The study looked at anticipated impacts from scour and any tidal changes, not only within project site, but also Snake Island and Winthrop Yacht Club.

› Pile Support Option Construction Considerations. Runway 9-27 is used in a majority of Logan Airport's runway use configurations – unlike Runway 15R-33L, there are no seasons with significantly lower utilization. Consideration was given for the following criteria:

- Impacts to airport operations
  - Minimize runway shutdowns
  - Evaluate temporary runway shifts/community impacts
- Coordination with other airfield construction projects
- Seasonal weather conditions
- Time-of-year restrictions in harbor (winter flounder, etc.)
  - No in-water work February 15 through June 30 of any year
- Harbor navigation - all physical work in City of Boston
- Community impacts (noise, truck trips, hours/duration of construction)

› Pile Support Options Comparison

- Criteria Considered during Development of Options
  - Support deck and EMAS
  - Support critical design aircraft fully loaded (Boeing 747-400)
  - Support Emergency Vehicles
  - Design life of 75 years
  - Withstand the most anticipated severe coastal scenarios
- Four substructure scenarios were studied: 2 pile options and 2 caisson/drilled shaft options

› Pile Support Alternatives Screening Summary

Screening Criteria	Deck Support Alternatives			
	1	2	3	4
	416 Concrete Piles	**326 Concrete Piles**	160 Caissons	128 Caissons
Permanent Coastal Wetlands Resource Area Impact:				
Total footprint of piles/caissons (total sq ft)	1,156	**867**	3,140	2,512
Total scour of piles/caissons (total meters^3)	291	**258**	826	873
Runway Closure/Airfield Disruption: Can construction be completed in 2 seasons @ 60 days/season?[a]	No	**Yes**	No	No
Other Considerations				
Impact to Surrounding Neighborhoods: Maximum construction noise levels (Lmax)[b]	69 dBA for 41 days	**69 dBA for 27 days**	52 dBA for 216 days	52 dBA for 168 days
Flexibility to demobilize/remobilize in event of emergency[c]	High	**High**	Low	Low
Permanent wetland resource area shading impacts from deck	same for all alternatives			

› Other Design/Construction Considerations

- Targeting two 60-day windows similar to Runway 33L RSA project considering:
  - Time-of-year restrictions for winter flounder
  - Maneuverability of barges
  - Constructability
- Perimeter road to be realigned at the Runway 27 End
- Land/deck interface requires sheet piling and other earthwork
- Emergency egress ramps to be installed on either side of deck
- Anticipated work hours would be limited to: Monday-Friday from 7 AM to 7 PM, Saturday from 8 AM to 7 PM, and Sunday from 9 AM to 7 PM. Occasional special deliveries or construction activities could occur outside these windows.
- In the event of a major storm, like Irene, the pile option offers more flexibility with the barges and cranes to demobilize and relocate. This is important also to the USCG since it will want the site 'made safe' and notified as to where the equipment is stored should there be a hurricane or other extreme weather event.

Agency/Department	Permit/Approval/Action	Status
Federal		
Federal Aviation Administration	National Environmental Policy Act (NEPA)	NEPA documentation forthcoming.
U.S Army Corps of Engineers	Section 10 of the Rivers and Harbors Act/ Section 404 of the Clean Water Act	To be obtained prior to construction.
National Oceanic and Atmospheric Administration Fisheries Service	Section 7 Consultation	To be completed prior to construction.
U.S. Environmental Protection Agency (EPA)	National Pollutant Discharge Elimination System Construction General Permit (NPDES CGP)	The Study Area may exceed 1 acre and require registration with the U.S. EPA. If needed, a Notice of Intent for registration with the NPDES CGP will be filed by the contractor. The associated Stormwater Pollution Prevention Plan will be developed by the contractor.
Commonwealth of Massachusetts		
Executive Office of Energy and Environmental Affairs	Massachusetts Environmental Policy Act (MEPA) Review Public Benefit Determination	Draft Environmental Impact Report (DEIR) submitted herein. To be issued by MEPA after the EIR review process.
Coastal Zone Management	Consistency Statement with Massachusetts Coastal Zone Management Plan	To be obtained prior to construction.
Massachusetts Department of Environmental Protection	Individual Section 401 Water Quality Certification for filling and for dredging Chapter 91 Waterways Program License Modification	To be obtained prior to construction. To be obtained prior to construction.
Massachusetts Natural Heritage and Endangered Species Program	Conservation and Management Permit	If required, prior to construction.
City of Boston		
Boston Conservation Commission	Massachusetts Wetlands Protection Act (WPA) Order of Conditions	To be obtained prior to construction.

› Anticipated Permits/Approvals Required

› Environmental Impact Updates
- There will be temporary and permanent impacts because of this project, although none are considered 'significant'.
- Although early in the overall permitting process, Massport is still determining required mitigation
  - Possible mitigation option: in-lieu fees for off-site replications
  - On-site stormwater: Potential to install additional stormceptors, if required
  - Project location entirely within City of Boston limits and filings with multiple agencies will be required as previously noted.

› Resiliency
- Grade of Runway 27 threshold was raised 10" during the 2020 runway rehabilitation as part of profile correction, taking this project into consideration as well.
- Elevation of 15.72 feet is below design flood elevations for new structures of 17.00 feet (Runway 4R light pier elevation is 14.5 feet, Runway 33L deck elevation is 15.43 feet).

› Innovation - ENVISION
- Conducting pre-assessment to determine if the project is qualified for verification under the Institute for Sustainable Infrastructure, Envision Infrastructure Framework.
- Framework includes 64 sustainability and resilience indicators organized into 5 categories.
- First for a Massport airfield project.
- Envision kickoff meeting will be held in conjunction with the Envision meeting for the Runway 15R-33L Rehabilitation project.

› Planned MEPA/NEPA and Permitting Schedule
- MEPA ENF filing - August 2021
- ENF Meeting - September 2021
- Draft EIR - June 2022
- Final EIR/EA* - Late 2022
- FONSI/MEPA Certificate issued - Late 2022/early 2023
- File permit applications - 2022-2023
- All permits/approvals issued - Summer 2023
- Final Design - 2023-2024
- Construction - 2025-2026

* The NEPA (federal/FAA) and MEPA (state) environmental reviews include multiple opportunities for public comments, as do the individual local, state, and federal environmental permit processes; where possible, these reviews will be combined.

› Next Steps

- File DEIR June 30, 2022 and hold public meeting
- MEPA closes comment period August 8, 2022
- Final EIR submitted; expected to be combined with NEPA EA
- Individual permit applications prepared and, when feasible, submitted: (some require final design to be completed)

› Questions and Discussion

- A. Hoenig of NHESP – Does the DEIR document Snake Island species?
  - State-listed species (Common Tern and Least Tern) are not nesting yet. Summary memo will be part of the DEIR.
- F. Schenck of DMF – Requests the DEIR describe turbidity and minimization measures to be used during construction.
  - Plan to use silt curtains for the pile-driving activities.
  - Forest confirmed no TOY restriction required for shellfish.
- K. Oetheimer of BCC – DEIR should show delineation of Coastal Bank.
  - New DEIR graphic will display this correctly. It roughly follows Elevation 9 ft. along where the slope of shoreline changes from 8:1 to 15:1. This is more defined by elevation than by constructed features.
- F. Schenck of DMF – Asked if Massport had coordinated with the badged shellfishers. Massport confirmed a coordination call was held June 2, 2022 with J. Kennedy and G. Bettencourt from DMF and 3 diggers. Forest expressed concern about availability to access under pier with boats.
  - S. Dalzell doesn't believe they are prohibited if there are resources under the pier (just no boat access).

This Page Intentionally Left Blank.

Appendix C.6- DEIR Filing Public Meeting

This Page Intentionally Left Blank

Runway 27 End RSA Improvements Project
Boston Logan International Airport
East Boston, Massachusetts

Meeting Notes

Date:	July 20, 2022	Notes Taken By:	Kristen Bergassi/VHB
Place:	Online Meeting via Zoom	Re:	DEIR Public Meeting
Project No.:	14792.00		

Panelists:

Sarah Dennechuk, Massport
Flavio Leo, Massport
Anthony Guerriero, Massport
Jennifer Hughes, MEPA Analyst
Meredith Avery, VHB
Sol Nemeth, Spanish Interpreter
Stewart Dalzell, Massport
Brad Washburn, Massport
Alaina Coppola, Massport
Amanda DeCesare, WSP
Kristen Bergassi, VHB
Corina, Interpreter LSI
Michael Vatalaro, Massport
Thomas Butler, Massport
Joe Choi, WSP
Daniel Tortoledo, PM LSI

Attendees:

Aaron Toffler, Massport CAC
Andrew Karedes
Bill Schmidt
Boston 25 News
Fernando Requena
John Nucci, Massport Board
John Vitagliano
Kim Friend
Liam Horsman, Senator Markey's Office
Margaret Roberts
Maura Zlody, Boston Environmental Dept.
Stephen Fox, Boston South End

Presentation

- S. Dalzell opened and provided an introduction of Massport, consultant panelists and Spanish translators. Massport noted this was the third public meeting on the project. Previous meetings included (1) a Pre-ENF meeting in compliance with MEPA's new Environmental Justice protocol, and (2) the formal ENF scoping meeting. This is a voluntary meeting on the DEIR.
- S. Dalzell and S. Dennechuk provided a PowerPoint presentation.
- After the presentation, Massport opened the meeting for questions and comments.

Questions and Answers

- Question (Aaron Toffler #1): Do all runways have RSAs? What is the schedule for compliance?
  - *Answer (Flavio Leo): Logan Airport was constructed before these latest FAA standard procedures. Massport does periodic reviews and assessments for each specific project. We are reviewing other runway ends, which take time for review. Together with FAA, more runways will be reviewed in future (such as Runway 4R-22L). We don't know what the recommended action will be. There is an EMAS bed at the end of Runway 22R, which has a shorter RSA.*
- Question (Aaron Toffler #2): Is there less traffic on Runway 27 because it does not have a conforming RSA?
  - *Answer (Flavio Leo): There is no restriction on use of Runway 27 due to the existing RSA.*

- Question (Stephen Fox): Which runways do and do not have RSAs? Do RSAs allow for use of heavier aircraft?
  - *Answer (Flavio Leo): All runways have RSAs, including at Logan Airport, but there are reviews to improve them. When pilots select runways to use, length of RSA is not a deciding factor nor is type of aircraft factored in.*
- Question (Aaron Toffler #3): How many trucks? How many barges? And where will they come from?
  - *Answer (S. Dennechuk): Specific construction details won't be known until the contractor is selected. Based on previous RSA projects, there are several locations where barges could come from, but the available sites change every year. For the Runway 4R light pier RSA project, barges came from South Boston, but that was an independent decision by the contractor.*
  - *The number of barges will be constrained by the limited construction space (possibly 2-4 barges), and safety is top priority. Truck traffic will not be significant as majority of equipment is coming from water, not land.*
- Comment (Margaret Roberts): Concerned about noise impacts and wants update on sound insulation.
  - *Answer (F. Leo): The residential sound insulation program is based on FAA eligibility and is separate program from this project. That process will start this summer. This project will not change the DNL (Day-Night Sound Level) sound levels.*
- Question (Aaron Toffler #4, representing the Massport CAC): What resources were evaluated for flight shifts?
  - *Answer (S. Dennechuk and F. Leo): Under normal operating conditions, flight patterns (use of different runways) shift based on variable weather and wind patterns. Resources evaluated included noise and environmental justice populations. Short-term construction impacts will be minimized to the extent possible.*

Appendix C.7- Massachusetts Department of Environmental Protection- Stormwater

This Page Intentionally Left Blank

Runway 27 End RSA Improvements Project
Boston Logan International Airport
East Boston, Massachusetts

Meeting Notes

Date:	October 18, 2022 at 1:00 PM	Notes Taken By:	Kristen Bergassi/VHB
Place:	Microsoft Teams	Re:	MassDEP Logan Runway 9-27 Improvements-DEIR Stormwater Discussion
Project No.:	14792.00		

ATTENDEES:

Sarah Dennechuk, Massport	Philip DiPietro, MassDEP	Christopher Conley, WSP
Brad Washburn, Massport	Thomas Maguire, MassDEP	Kristen Bergassi, VHB
Stewart Dalzell, Massport	Amanda DeCesare, WSP	Gene Crouch, VHB
David Hilgeman, MassDEP	Marla Engle, WSP	

Summary

The purpose of this meeting was to review Massport's Runway 27 End RSA Improvements Project (the Project) occurring at Logan Airport with the Massachusetts Department of Environmental Protection (MassDEP). This coordination is taking place as directed by the Secretary of Energy and Environmental Affairs (EEA) Certificate on the Draft Environmental Impact Report (DEIR) and in response to MassDEP comments to discuss the Project's location within Boston Harbor, its associated permanent and construction period impacts, and minimization, avoidance, and mitigation to reduce impact to the MassDEP's interests and resources.

Notes

- S. Dalzell provided a brief introduction of meeting attendees.
- T. Maguire and D. Hilgeman worked with Mike Stroman at Massport on prior RSA permitting projects.
- MassDEP determined the Project may require a local permit and a variance from the regional office.
- MassDEP looked at National Pollution Discharge Elimination System (NPDES) permitting for the composition and Total Suspended Solids (TSS) of runoff was at other RSAs.
- Additionally, MassDEP noted there was a drop-off from the deck to the Land Under the Ocean.
- Massport stated the deck is a discrete area and would not collect runway runoff.
- MassDEP stated certain limited projects and their adherence to performance standards would trigger a variance.
- Partially dependent if a surface is impervious or pervious; MassDEP noted the surface is concrete (impervious).
- C. Conley stated the RSA has zero slope but slight crown with EMAS blocks which will work to capture any runway runoff. Advised to avoid runoff from runway going onto deck. The roadway has been realigned for

safety and maintenance while the deck is only for emergency use only. Stormwater could be collected via scuppers along the deck, and then released.

- T. Maguire recalls for Runway 33L there was a scupper system and required energy dissipation so turbidity would not increase at low tides. The variance for Runway 33L should be consulted as he doesn't specifically recall what was piped back to landside, or if it was just dispersion.
- G. Crouch noted that at low water the runoff could be discharged at the end of the deck in 22 feet of water. Energy dispersers could be put into scuppers or could be piped off deck.
- S. Dalzell asked if it would be preferable to take the stormwater collected from the deck and carry it to the outer, seaward end of deck. For several reasons, including that this area is tidally influenced, underground storage is not feasible. Similarly, surface detention must be avoided as it is a hazardous wildlife attractant.
- MassDEP referred Massport to the alternatives analysis for prior variance. MassDEP stated that stormwater measures in the DEIR seemed dismissive/not applicable.
- Massport stated that the deck is subject to minimal vehicle use, like a clean roof under stormwater standards. Roof runoff doesn't have to pre-treat prior to infiltration.
- T. Maguire brought up the mitigating factor of stormwater standards do apply.
- T. Maguire asked if in the roadway is there a sag or crowned? Is the roadway salted or sanded?
- S. Dennechuk stated it would be chemical treatment, mirroring what is used on runway.
- T. Maguire replied that it may still be salt based. If acetate-based chemical used near the edge of the water. Design roadway to mitigate that.
- G. Crouch stated there is no salt marsh here. No mud flat (per regulations based on elevations) but Land Under the Ocean here. Going to need a 401 certification (will use Waters of U.S. measures).
- Massport noted review of prior study from other runway for shadow survey. Very low shellfish clam numbers exist here. Habitat is there but quantity is very low. Construction on finfish and shellfish will be coordinated with DMF. DMF does not want Massport to relocate shellfish with neoplasia.

Action Items

- Massport to confirm stormwater management measures included in past variance. May need different treatment between landside and waterside.
- FEIR should address stormwater standards, understanding specifics may not be available at this conceptual level of design.
- MassDEP cannot accept in-lieu fee contributions. Massport to commit to offset impacts. (U.S. Army Corps of Engineers can accept in-lieu fee contributions for Section 10 and Section 404. Massachusetts DMF can accept in-lieu fee for shellfish restoration program.)
- Massport to look at shading impacts. MassDEP suggests that the entire deck is impact area (not just piling impact area).
- Massport to confirm if looking for replacement of mud flat.

Appendix D- FONSI

This Page Intentionally Left Blank

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT

DRAFT FOR REVIEW AND COMMENT

The draft Finding of No Significant Impact (FONSI) is being made available by the Federal Aviation Administration (FAA) for review by other federal agencies with jurisdiction by law or regulation over the proposed action and interested members of the public. The draft FONSI will be available for a 30-day review period from the notice of availability of the Environmental Assessment to which this draft FONSI is attached. Comments on the draft FONSI should be directed to the attention of Cheryl Quaine, Environmental Protection Specialist, FAA.

Runway 27 End Runway Safety Area Improvements Project
Boston Logan International Airport (Logan Airport)
East Boston, Massachusetts

Proposed Action

The Massachusetts Port Authority (Massport) is the sponsor of the Boston Logan International Airport (Logan Airport) **Runway 27 End Runway Safety Area Improvements Project** (the Project or the Proposed Project). The purpose of the Proposed Project is to increase safety for aircraft, passengers, and crew in emergency situations by enhancing the Runway Safety Area (RSA) at the end of Runway 27 consistent with FAA design standards. The proposed safety improvements include:

- A pile-supported deck structure, approximately 450 feet long and 306 feet wide, with an area of approximately 137,700 square feet (3.2 acres), elevated above the surface of Boston Harbor.
- An approximately 350-foot-long wall (bulkhead) at the inshore limit of the deck and within the existing Inclined Safety Area (ISA) footprint to prevent settlement and erosion of the upland areas.
- A supporting structure for the deck comprised of 326 twenty-inch square concrete piles driven to rock spaced 50 feet apart with cast in place (CIP) pile caps, precast girders, and a CIP 15-inch deck slab that sits above the surface of the water.
- An Engineering Materials Arresting System (EMAS), approximately 500 feet long by 170 feet wide, located atop the RSA deck.
- Realignment and straightening of the existing 20-foot-wide airport perimeter road on the north side of the Runway 27 End to enhance vehicular sight lines and situational awareness for vehicles crossing the runway end, while remaining clear of the EMAS.
- Two 25-foot-wide emergency egress ramps, located on either side of the proposed RSA deck.
- Life rings on the sides and end of the deck to enhance access in and out of the water in an emergency.
- Safety railings along the sides and end of the proposed RSA deck.

Federal actions include federal funding decisions for any portion of this Project and approval of the revised Airport Layout Plan. The Proposed Project also requires a Department of the Army Section 404 and Section 10 Permit, which is issued by the U.S. Army Corps of Engineers.

Massport and FAA prepared an Environmental Assessment (EA) to assess this proposed action. The EA incorporates an Environmental Impact Report (EIR) in accordance with the provisions of the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations.

Alternatives Considered

The EA/EIR included a summary of the two-step process undertaken by Massport and FAA to identify reasonable alternatives for enhancing the safety of the existing RSA at the end of Runway 27. The first step of the analysis examined six alternatives for enhancing the RSA at the end of Runway 27, as well as the No Action Alternative. This analysis is detailed in the *Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study* (the RIM Study), which is included as Appendix B. The analysis concluded that the only reasonable alternative for enhancing the RSA at the end of Runway 27 consistent with the FAA requirements is an approximately 650-foot-long RSA with an EMAS on a 306-foot-wide deck extending into Boston Harbor. This alternative, which is named RSA Alternative 4B, would provide the highest level of aircraft safety without reducing the operational capability of the runway, while also minimizing environmental impacts in Boston Harbor. The FAA's 2019 RSA Determination (Appendix B) directed Massport to construct an improved RSA with EMAS on a deck but did not specify the type of deck support structure to be constructed, nor did it specify the size of the EMAS. See the RIM Study for more detail on the Tier 1 screening.

The second step of the analysis, which is summarized in Section 2.3.2 of the EA/EIR, considered structural options for supporting the deck. The analysis found that compared to the other alternatives considered, Deck Support Alternative 2, which would be constructed on 326 twenty-inch square piles and could be constructed in 120 days, would have the least impact on environmental resources and could be constructed with the least operational impacts to the airfield. Thus, RSA Alternative 4B, constructed on Deck Support Alternative 2, was carried forward as the Proposed Action for further analysis and evaluation in the EA/EIR.

Assessment

The proposed safety improvements are required to enhance the RSA, to the extent feasible, to be consistent with FAA's airport design criteria for RSAs and to enhance rescue access in the event of an emergency. Like most airports, Logan Airport was constructed before many of the current safety standards were developed and several of the runway ends are at the water's edge. Standard RSAs at commercial service airports like Logan Airport, based on FAA requirements, extend 1,000 feet beyond the ends of the runway and are 500 feet wide. RSAs are safety improvements and do not extend runways or have any effect on normal runway operations, runway capacity or types of aircraft which can use the runways. Logan Airport is a commercial service airport that receives federal funding for airport improvement projects and is required by the FAA to meet the

RSA design criteria contained in the FAA Advisory Circular 150/5300-13B, *Airport Design*,[1] to the extent feasible.

The project was evaluated in a combined state/federal document, **Draft Environmental Assessment/Final Environmental Impact Report, EEA No. 16433, December 15, 2022**. Chapter 3 provides a review of the impact of the Proposed Project across 16 environmental categories in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA). The report was accepted as a federal document by the FAA on [DATE]. On [DATE], the Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs issued a Certificate finding the Final EIR "adequately and properly complies with the Massachusetts Environmental Policy Act."

Consistency with Community Planning

The enhancement of safety at Logan Airport is consistent with local, state, and community planning.

Mitigation Measures

The proposed action includes mitigation for unavoidable impacts to mud flats. Massport has committed to provide the following mitigation measures, as detailed in Chapter 4 of the EA/EIR:

- Any in-water silt production construction activities will conform to a time of year restriction of February 15 to June 30 of any year to protect spawning winter flounder.
- Turbidity curtains will be used to surround the in-water construction work area to contain any turbidity that may be created.
- Erosion controls will be installed at the limit of the upland work area to provide a visual boundary of the work area and prevent release of sediment from the work area.
- Approximately 1,200 square feet of mud flat will be impacted by the placement of deck piles and the emergency egress ramps. In accordance with state requirements, the impacted intertidal and subtidal habitat will be replaced or restored elsewhere in Boston Harbor on a 1:1 area basis.
- In accordance with federal requirements, loss of mud flat and subtidal areas will be mitigated using USACE In-lieu Fee Program. Estimated value is $17,200.
- The DMF determined the collecting and relocating the soft shell clams was not warranted. Massport will contribute funding to the DMF shellfish restoration program.
- Approximately 20,300 square feet of grassland habitat of state listed rare bird species will be permanently impacted by the Project and an additional 22,000 square feet of grassland will be temporarily impacted. Massport will work with the NHESP to look for opportunities to reduce impacts and identify suitable locations within the airfield where an equivalent area of existing pavement can be removed and converted to grass. The temporarily altered grassland habitat will be fully restored in place.

1 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

- Construction-phase noise reduction measures to include using a vibratory pile driver as much as possible, using a ramp-up or soft start for hammer driving and padding on top of the pile to lessen the sound.

Massport commits to follow appropriate construction management practices to minimize minor temporary construction related impacts. Air quality emissions are below *de minimis* levels for each criteria pollutant. All federal and state water quality requirements will be met.

Finding of No Significant Impact

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information, I find the proposed federal action is consistent with existing national environmental policies and objectives of Section 101(a) of NEPA and other applicable environmental requirements. I also find the proposed federal action, with the required mitigation referenced above, will not significantly affect the quality of the human environment, or include any condition requiring any consultation pursuant to section 102(2)(C) of NEPA. As a result, FAA will not prepare an EIS for this action.

APPROVED:

_____ _____
Cheryl Quaine Date
Environmental Protection Specialist

DISAPPROVED:

_____ _____
Cheryl Quaine Date
Environmental Protection Specialist

Appendix E- Technical Memoranda

This Page Intentionally Left Blank.

Appendix E.1- Air Quality and Noise Supporting Documentation

This Page Intentionally Left Blank

Air Quality

E.1.1 Introduction

This Appendix contains the methodology, technical data, and background data used to prepare the air quality analysis for the construction of the proposed Runway 27 End Runway Safety Area (RSA) Improvements Project (the Project or the Proposed Project) at Boston Logan International Airport (Logan Airport or the Airport). Because the Proposed Project would not extend runways nor have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway, once construction is complete, the presence of the RSA would have no impact on airfield or aircraft emissions. Accordingly, the air quality analysis evaluates the temporary impacts associated with construction of the safety improvements.

E.1.2 Construction Period Air Quality Methodology

For this Project, construction-related emissions are primarily associated with the exhaust from heavy equipment (i.e., excavators, bulldozers, graders, etc.); delivery trucks and marine vessels traveling to and from the site; dust from site preparation, land clearing, material handling, equipment movement on unpaved areas, and demolition activities; and fugitive emissions from the storage/transfer of raw materials. These emissions are temporary in nature and generally confined to the construction area and the access/egress roadways.

Emissions from construction activities were estimated based on the number of vehicles/pieces of equipment, the types of equipment/type of fuel used, vehicle/equipment utilization rates, and the projected duration and schedule of construction activity (construction of the Project is anticipated to occur for 120 days total during two separate 60-day periods, one each in the third quarter of 2025 and 2026).

The emission inventories for off-road (non-highway) equipment were calculated using emission factors obtained from the U.S. Environmental Protection Agency's (USEPA) NONROAD module contained within the USEPA's Motor Vehicle Emissions Simulator (MOVES3) mobile source model.[1] Emission factors for on-road (highway) pickups, delivery trucks, escort vehicles, and other on-road regulated vehicles were obtained from the on-road module in MOVES3. Emissions model input parameters were developed to be as consistent with regional meteorological conditions and vehicle data as possible. Emissions model default parameters were assumed where data were unavailable. Finally, marine vessel

1 U.S. Environmental Protection Agency, Motor Vehicle Emissions Simulator (MOVES3), January 2021.

emissions factors were derived from the EPA's *Port Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions*, published in April 2022.[2]

Emission factors for each off-road equipment type were applied to the anticipated equipment work output (horsepower-hours of expected equipment use). Operating times for the equipment were conservatively based on a 12-hour workday which represents the maximum amount of time equipment may be operating. A load factor accounting for the average throttle setting relative to capacity were used. That is, a load factor of 0.62 equates to 62 percent of capacity during operation. For the off-road equipment, sulfur dioxide (SO_2), and particulate matter emission factors, diesel sulfur content was consistent with the assumptions and data used in other local and regional air quality analyses.

To estimate exhaust emissions from on-road vehicles and construction equipment, emissions factors were developed using the USEPA's Motor Vehicle Emissions Simulator model (MOVES3) (on road and nonroad modules). The factors were applied to the anticipated levels of activity identified in the Project construction schedule. Marine vessel emissions were quantified according to separate guidance published by USEPA and incorporated usage and travel estimates contained within the construction schedule. Asphalt paving and fugitive dust emissions factors were obtained from the USEPA emission factor document AP-42 and other relevant publications and were applied to estimated Study Areas to be paved and/or disturbed by the construction activities. For on-road vehicles, the anticipated vehicle miles traveled (VMT) were estimated to determine annual emissions. Emissions from marine tugs, work boats, man boats, and crew boats were estimated using updated USEPA emission factors and engine load factors for Harbor Craft. The following equations were used to obtain annual emission rates for off-road equipment, on-road vehicles, materials barge tugs, work boats and personnel boats:

- Off-Road Emission Rate (tons per year) = Emission Factor (grams per horsepower-hour) * size (horsepower) * 12 hours per day * shifts/quarter * quarters/year * Load Factor * (453.59/2,000 tons/gram)
- On-Road Emission Rate (tons per year) = Emission Factor (grams per mile) * average trip VMT * shifts per quarter * quarters per year * (453.59/2,000 tons/gram)
- Material Barge, Work Boat, and Personnel Vessel Emission Rate (tons/year) = Emission Factor (grams per kilowatt hour) * size (kilowatts) * Load Factor * 12 hours/day * shifts/quarter * quarters per year * (453.59/2,000 tons/gram)

To estimate emissions associated with on-road motor vehicles, including vehicles utilized for the purposes of materials delivery, security, escorting and project management, the following assumptions were applied. For a conservative estimate of air emissions, all vehicles were assumed to travel round trip distance of 5 miles to the off-site materials source at an average speed of 20 miles per hour. Where applicable, 12 hours per day of work was conservatively applied to calculations (as noted above). Marine vessels were assumed to travel round trip to a staging area located in Quincy, Massachusetts (where applicable).

2 U.S. Environmental Protection Agency, Office of Transportation and Air Quality, Transportation and Climate Division, *Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions*, EPA-420-B-22-011, April 2022.

Additionally, the construction emissions inventories for fugitive dust sources were calculated using emission factors within USEPA's *Compilation of Air Emissions Factors* (AP-42)[3] and the Western Regional Air Partnership (WRAP) Fugitive Dust Handbook.[4]

Fugitive dust emissions can result from the following activities: grading, moving soil, and digging, loading/unloading of trucks, movement of trucks on unpaved surfaces, and wind erosion of stockpiles. A fugitive dust emission factor of 0.011 tons per month per acre disturbed and 0.059 tons per 1,000 cubic yards of soil disturbed was used. For a conservative estimate, twice the project area was assumed to be disturbed on a typical construction day. Additionally, fine particulate matter (particulate matter smaller than or equal to 2.5 microns in diameter [$PM_{2.5}$]) was assumed to be 10 percent of particulate matter (PM_{10}) based on AP-42. Dust control measures and best management practices would be implemented to minimize fugitive dust and particulate emissions. A dust control efficiency of 75 percent due to daily watering and other measures was estimated based on AP-42.

Evaporative volatile organic compounds (VOC) emissions associated with the application of hot mix asphalt on areas requiring paving were not directly included in the construction emission estimate. The quantity of raw material used for asphalt paving are not available in the projected construction schedule. However, similar to construction for the adjacent Runway 33L RSA deck, which is a similar scope construction project, determined VOC emissions from asphalt paving were 0.11 tons per year. A similar quantity of VOC emissions would be expected for the Proposed Project and would add a minimal amount of VOC to the Project construction total.

The following tables document the emissions factors used in the analysis and the resulting emissions estimates for the Proposed Project (RSA Deck Support Alternative 2).

3 U.S. Environmental Protection Agency, AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, January 1995, as amended.
4 Western Regional Air Partnership, *WRAP Fugitive Dust Handbook*, prepared for the Western Governors' Association by Countless Environmental, September 7, 2006.

Table E.1-1 Off-Road Emission Factors (from MOVES3 – Nonroad)

Equipment Type	Horsepower	Load Factor	Emission Factor (grams per horsepower hour)					
			VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
250 Ton Crane	400	0.47	0.229	0.046	1.057	0.002	0.036	0.035
300 Ton Crane	500	0.47	0.229	0.046	1.057	0.002	0.036	0.035
Bulldozer	170	0.59	0.092	0.013	0.274	0.001	0.023	0.022
Cold Planer	630	0.59	0.570	0.074	1.556	0.002	0.075	0.073
Tandem Roller	134	0.62	0.181	0.025	0.423	0.001	0.047	0.045
Tandem Paver	173	0.66	0.129	0.018	0.355	0.001	0.033	0.032
Compressor	265	0.43	0.133	0.035	0.549	0.001	0.027	0.026
Concrete Pump	66	0.59	2.484	0.507	5.452	0.002	0.460	0.446
Dozer	130	0.59	0.092	0.013	0.274	0.001	0.023	0.022
Excavator	272	0.59	0.031	0.011	0.139	0.001	0.009	0.008
Fork Lift	100	0.59	0.052	0.007	0.857	0.002	0.012	0.012
Heavy Duty Concrete Power Screed	13	0.59	245.863	4.874	2.729	0.006	0.112	0.103
Hydraulic Hammers with Powerpak	350	0.48	0.631	0.082	1.702	0.002	0.083	0.081
Hydraulic Pile Cutting Machine	142	0.48	0.184	0.038	0.546	0.001	0.042	0.041
Loader	140	0.48	1.034	0.306	2.090	0.002	0.220	0.213
Mortar Concrete Mixer	8	0.59	245.864	4.874	2.729	0.006	0.112	0.103
Portable Generator	5.6	0.68	182.970	6.451	3.293	0.007	0.313	0.288
Ready Mix Concrete Truck	425	0.59	0.033	0.011	0.139	0.001	0.009	0.008
Ride On Power Trowel	31	0.49	10.405	0.349	1.631	0.004	0.069	0.064
Tack Coat Truck	210	0.59	0.020	0.009	0.114	0.001	0.007	0.006
Truck Mounted Concrete Pump	400	0.59	1.066	0.206	4.614	0.002	0.137	0.133
Vacuum Sweeper Truck	205	0.59	0.020	0.009	0.114	0.001	0.007	0.006
Vibratory Roller	157	0.62	0.181	0.025	0.423	0.001	0.047	0.045
Vibro Hammer with Powerpak	350	0.48	0.631	0.082	1.702	0.002	0.083	0.081
Welder Machine	23.5	0.21	2.555	0.541	4.116	0.003	0.308	0.299

Source: U.S. Environmental Protection Agency, Motor Vehicle Emissions Simulator, Version 3.
VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; PM_{10} = particulate matter; $PM_{2.5}$ = fine particulate matter.

Table E.1-2 On-Road Emission Factors (from MOVES3 – On-Road)

	Emission Factor (grams per mile)					
Emission Source	**VOC**	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
2,500 Gallon Water Truck	1.252	0.098	1.956	0.003	0.035	0.032
Delivery Truck	1.015	0.085	0.801	0.002	0.028	0.025
Dump Truck	2.189	0.129	4.084	0.005	0.065	0.060
EMAS Tractor Trailer	2.189	0.129	4.084	0.005	0.065	0.060
Escort Vehicle	1.413	0.017	0.025	0.002	0.001	0.001
Mechanic Truck	1.015	0.085	0.801	0.002	0.028	0.025
Pickup Truck	1.413	0.017	0.025	0.002	0.001	0.001
Survey Van	1.413	0.017	0.025	0.002	0.001	0.001
Worker Van	1.413	0.017	0.025	0.002	0.001	0.001

Source: U.S. Environmental Protection Agency, Motor Vehicle Emissions Simulator, Version 3.
VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; PM_{10} = particulate matter; $PM_{2.5}$ = fine particulate matter.

Table E.1-3 Estimated Proposed Project Construction Emissions (tons/year)

	VOC		CO		NO_x		SO_2		PM_{10}		$PM_{2.5}$	
Emission Source	**2025**	**2026**	**2025**	**2026**	**2025**	**2026**	**2025**	**2026**	**2025**	**2026**	**2025**	**2026**
Off-Road	7.96	2.65	0.49	0.17	5.19	1.65	0.01	0.00	0.29	0.10	0.28	0.10
On-Road	0.079	0.062	0.004	0.003	0.101	0.076	0.0002	0.0001	0.002	0.001	0.002	0.001
Marine Vessels	0.23	0.21	1.46	1.32	8.60	7.77	0.01	0.01	0.18	0.16	0.17	0.15
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.87	0.13	0.12
Total	**8.27**	**2.93**	**1.95**	**1.49**	**13.89**	**9.50**	**0.02**	**0.01**	**1.38**	**1.13**	**0.58**	**0.37**
General Conformity *de minimis* Threshold	*50*	*50*	*100*	*100*	*100*	*100*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Proposed Project *de minimis* Applicability Result (Pass/Fail)[1]	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

Source: WSP 2022.

VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; PM_{10} = particulate matter; $PM_{2.5}$ = fine particulate matter.

1 Determined by comparing the estimated total emissions for each pollutant in each year to the applicable *de minimis* value.

Noise

E.1.3 Introduction

Because the Proposed Project would not extend runways nor have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway, once construction is complete, the presence of the RSA would have no impact on airfield or aircraft noise levels. Accordingly, the discussion of potential noise impacts focuses on the temporary impacts associated with construction of the safety improvements.

E.1.4 Construction Period Noise Methodology

For this Project, construction-related emissions are primarily associated with the exhaust from heavy equipment (i.e., excavators, bulldozers, graders, etc.); delivery trucks and marine vessels traveling to and from the site; dust from site preparation, land clearing, material handling, equipment movement on unpaved areas, and demolition activities; and fugitive emissions from the storage/transfer of raw materials. These emissions are temporary in nature and generally confined to the construction area and the access/egress roadways.

E.1.4.1 Construction Period Aircraft Operations

Construction associated with the Proposed Project would result in the temporary closure of Runway 9-27 during each of the planned 60-day construction periods in 2025 and 2026 (120 days total). During the temporary closure of Runway 9-27, aircraft operations are anticipated to temporarily shift from Runway 9-27 to other runways already in use, temporarily increasing the number of operations along the flight paths of the other runways. Overall operations would remain the same with the equivalent decrease in Runway 9-27 operations. There may be some temporary changes in aircraft noise due to the closure of Runway 9-27 during each of the 60-day construction periods in 2025 and 2026. As described in the Air Quality section above, no new flight paths will be created during the construction period, rather flights would be temporarily reallocated to existing runways and flight paths. The short-term shift in aircraft runway use will depend on wind, weather, and Federal Aviation Administration (FAA) air traffic control safety determinations. There is expected to be minimal impact from the Project on the continued preferential use of Runway 15R for late-night departures and Runway 33L for late-night arrivals (a noise abatement procedure to route late-night operations over water rather than over noise-sensitive land uses).

If FAA is utilizing a northeast flow aircraft traffic pattern, aircraft that would have departed from Runway 9 are expected to shift primarily to Runway 4R; in a southwest flow, aircraft that would have landed on Runway 27 are expected to primarily shift to Runway 22L. In a northwest flow, aircraft that would have landed or departed on Runway 27 are expected to shift primarily to Runway 33L or Runway 32.

During the summer of 2021, approximately 10 percent of arrivals used Runway 27 and based on a similar closure in 2020 to Runway 9-27, these arrivals primarily used Runway 22L instead. During the 2021 period,

approximately 24 percent of departures used Runway 9 and 9 percent used Runway 27. During the similar closure of Runway 9-27 in 2020, the majority of the Runway 9 departures shifted to Runway 4R and a small portion to Runway 15R and the Runway 27 departures shifted primarily to Runway 22R. However, it is not possible to predict what the weather and wind patterns will be during the 2025/2026 construction periods.

Since no new flight paths will be in use during construction, there would be no additional impact to neighboring communities, including environmental justice communities. Short-term changes in air traffic procedures not to exceed six months to accommodate airport construction, such as during the proposed Runway 9-27 closures, are categorically excluded from environmental analysis because the FAA has determined that this type of action does not have a significant effect on the human environment (Section 5-6 of FAA Order 1050.1F). The proposed RSA improvements would not change how Logan Airport operates and therefore, no permanent changes to the Airport noise profile would occur with this project.

Construction Period Activities

Construction-period noise is anticipated for 120 days total during two separate 60-day periods. As described in Section 3.11 of the Draft Environmental Assessment/Final Environmental Impact Report, noise levels are not anticipated to exceed the City of Boston's construction noise limit criteria. Massport will minimize noise from surface traffic during construction by having much of the construction materials and workers access the Project site by water on barges and boats. Trucks used to transport concrete and the Engineered Materials Arresting System (EMAS) materials would access the site by Route lA, Interstate 90, and the main Airport roadways only. Trucks would be prohibited from using local streets unless they are seeking construction-related access to or from local businesses.

Appendix E.2- Draft Coastal Zone Management Consistency Statement

This Page Intentionally Left Blank

Runway 27 End Runway Safety Area Improvements Project Draft Coastal Zone Management Consistency Review

Boston Logan International Airport
East Boston, Massachusetts

Prepared for **Massachusetts Port Authority**
One Harborside Drive
East Boston, MA 02128-2909

Prepared by

101 Walnut Street
Watertown, Massachusetts

December 2022

This Page Intentionally Left Blank

Contents

Tables

Figures

1 Introduction

The Massachusetts Port Authority (Massport) is proposing to improve the Runway Safety Area (RSA) at the end of Runway 27 at Boston Logan International Airport (Logan Airport or the Airport), adjacent to Boston Harbor (refer to **Figure E.2-1**). The proposed Runway 27 End RSA Improvements Project (the Project or the Proposed Project) is required to meet the RSA design criteria in the Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5300-13B, *Airport Design*,[1] and to enhance rescue access in the event of an emergency**.**

The Massachusetts Office of Coastal Zone Management (CZM) implements the state's coastal program under the federal Coastal Zone Management Act (CZMA) of 1972. The CZM reviews federal projects to ensure they meet state standards articulated in the Massachusetts Coastal Zone Management Plan through a process called federal consistency review. The federal consistency review requirement of the CZMA holds that federal actions that have reasonably foreseeable effects on any land or water use or natural resources of a state coastal zone must be consistent with the enforceable policies of the federally approved coastal management program for that state. Federal consistency review is required for most projects that:

1) Are in or can reasonably be expected to affect a use or resource of the Massachusetts coastal zone, and/or
2) Require certain federal licenses or permits, receive certain federal funds, are a direct action of a federal agency, or are part of outer continental shelf plans for exploration, development, and production.

The proposed safety project is within the Massachusetts Coastal Zone (Boston Harbor) region. Massport has prepared this draft federal consistency review for CZM in accordance with Title 301 of the Code of Massachusetts Regulations (CMR) 20.00, *Coastal Zone Management Program.* The Project will be partially funded by the FAA and will require a Section 10/404 permit from the U.S. Army Corps of Engineers (USACE).

The proposed activity complies with the program policies of the Massachusetts approved coastal management program and will be conducted in a manner consistent with such policies.

1 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

FIGURE E.2-1: Logan Airport Aerial **Runway 27 End RSA Improvements Project**

Proposed Project Site
Logan Airport Property Line
Political Jurisdictions

0 1000 2000 4000 Feet

Sources: VHB 2021, ESRI, Nearmap Imagery March 2022

As required by 301 CMR 20.00 and as described in the CZM Policy Guide,[2] this application includes:

- A description of the proposed safety project (Chapter 2, *Project Description*);
- A listing of the specific CZM enforceable program policies relevant to the Project and complete analysis and descriptions of how the Project is consistent with these policies and their underlying authorities (Chapter 3, *Compliance with CZM Program Policies*); and
- A certification that "the proposed activity complies with the program policies of the Massachusetts approved coastal management program and will be conducted in a manner consistent with such policies" (Chapter 1, *Introduction*).

The USACE authorization would require an approved Coastal Zone Management Consistency Statement from the CZM demonstrating the Proposed Project is consistent with the approved Massachusetts Coastal Zone Management Program and program policies. Massport believes that the proposed Runway 27 End RSA Improvements Project can be designed and constructed to be consistent with the CZM Program and program policies as set forth in 301 CMR 20.00.

1.1 Purpose of the Project

The purpose of the Project is to enhance safety for aircraft and their passengers in emergency situations by providing an RSA at the end of Runway 27 that is consistent with current FAA requirements. **This Project is a required FAA safety project that would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway.**

1.2 Need for the Project

Logan Airport, certificated under 14 Code of Federal Regulations (CFR) Part 139, is a commercial service and general aviation airport that receives federal funding for airport improvement projects, and is therefore federally obligated by FAA Order 5200.8[3] to meet the RSA design criteria contained in FAA AC 150/5300-13B, *Airport Design*, to the extent practicable.[4]

2 Massachusetts Office of Coastal Zone Management, Policy Guide, October 2011.
3 U.S. Department of Transportation, Federal Aviation Administration, Order 5200.8, *Runway Safety Area Program*, October 1, 1999.
4 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

1.3 MEPA and NEPA Status

On August 31, 2021, Massport filed an Environmental Notification Form (ENF) with the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), in accordance with the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations specified in 301 CMR 11.00. The ENF was circulated to interested parties in accordance with 301 CMR 11.16(2) and a Public Notice of Environmental Review was published on September 2, 2021. A virtual public consultation session on the ENF was held on September 22, 2021, to receive comments on the Project, and for MEPA's and the FAA's use in determining the scope for a state Environmental Impact Report (EIR) and the National Environmental Policy Act (NEPA) review document. The Secretary of Executive Office of Energy and Environmental Affairs (EEA) issued a Certificate on the ENF on October 8, 2021, confirming the need to prepare an EIR and describing the Draft Environmental Impact Report (DEIR) scope elements.

On June 30, 2022, Massport filed a DEIR with the Massachusetts EEA, in accordance with the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations specified in 301 CMR 11.00. The ENF was circulated to interested parties in accordance with 301 CMR 11.16(2) and a Public Notice of Environmental Review was published on July 8, 2022. A virtual public consultation session on the DEIR was held on July 20, 2022, to receive comments on the Project, and for MEPA's and the FAA's use in determining the scope for a state EIR and the National Environmental Policy Act (NEPA) review document. The Secretary of EEA issued a Certificate on the DEIR on August 29, 2022, confirming the need to prepare a Final Environmental Impact Report and describing the scope elements.

The Project constitutes a federal action and therefore requires FAA to comply with the requirements of NEPA. This document is a combined Draft Environmental Assessment (EA)/Final EIR. It is anticipated that the FAA will issue its decision document on the Proposed Action at the completion of the EA review process. The Final EIR was prepared in accordance with the scope outlined in the DEIR Certificate. There have been no changes to the project since the DEIR.

The Draft EA/Final EIR will be circulated to those who commented on the ENF, the DEIR, and other interested parties. A Public Notice of Environmental Review will be published in the Environmental Monitor in accordance with MEPA regulations 301 CMR 11.05 and 301 CMR 11.15. There will be a 30-day public comment period following publishing of the Environmental Monitor. The Secretary of EEA will issue a Certificate on the FEIR. It is anticipated that the FAA will issue its decision document at the completion of the NEPA review process.

The USACE authorization requires a CZM Consistency Statement demonstrating the proposed RSA improvements are consistent with the approved Massachusetts Coastal Zone Management Plan. The DEIR and this Draft EA/Final EIR document the evaluation and impacts analysis to resource areas, resulting changes in water flow that may result in scour, and shaded areas. Massport will continue to consult Massachusetts Department of Environmental Protection (MassDEP), Massachusetts Division of Marine Fisheries (DMF), National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, and the U.S. Coast Guard on potential Project impacts to ensure consistency with the Coastal Zone Management Plan.

1.4 Permits and Approvals

In addition to compliance with the CZM Consistency Statement, it is anticipated that the following federal, state, and local/city permits are also needed for the proposed Runway 27 End RSA Improvements Project, as listed in **Table E.2-1**.

Table E.2-1 Anticipated Project Permits and Approvals

Agency/Department	Permit/Approval/Action
Federal	
Federal Aviation Administration (FAA)	• National Environmental Policy Act (NEPA)
U.S. Army Corps of Engineers (USACE)	• Section 10 of the Rivers and Harbors Act • Section 404 of the Clean Water Act
National Oceanic and Atmospheric Administration (NOAA) Fisheries Service	• Section 7 Endangered Species Consultation
U.S. Coast Guard (USCG)	• Navigation Coordination
U.S. Environmental Protection Agency (USEPA)	• National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP)
Commonwealth of Massachusetts	
Executive Office of Energy and Environmental Affairs (EEA)	• Massachusetts Environmental Policy Act (MEPA) Review • Public Benefit Determination
Massachusetts Department of Environmental Protection (MassDEP)	• Individual Section 401 Water Quality Certification • Chapter 91 Waterways Program License Modification
Massachusetts Natural Heritage and Endangered Species Program (NHESP)	• Conservation and Management Permit (if required)
City of Boston	
Boston Conservation Commission (BCC)	• Massachusetts Wetlands Protection Act (WPA) Order of Conditions

Note: This is a preliminary list of local, state, and federal permits and approvals that may be sought for the Project. This list is based on current information about the Project and is subject to change as the design of the Project evolves.

This Page Intentionally Left Blank

2 Project Description

As described in FAA Order 5100.38D, Change 1, *Airport Improvement Program Handbook*,[5] RSAs are one of the most critical safety features on an airfield. An RSA is a flat surface surrounding the runway that is clear of obstructions. The FAA requires airports to provide RSAs at runway ends and on the sides of a runway to reduce the risk of injury to persons and damage to aircraft in the event of an overrun (an arriving aircraft fails to stop before the end of the runway), an undershoot (an aircraft arriving on a runway touches down before the start of the paved runway surface), or a veer-off to one side of a runway. The proposed Runway 27 End RSA Improvements Project would advance an overriding public interest of safety consistent with Title 49 of U.S. Code Section 47101, which states "that the safe operation of the airport and airway system is the highest aviation priority."[6]

In November 2005, Congress mandated that all commercial service airports (including Logan Airport) improve their RSAs to meet FAA minimum standards, to the extent feasible, by 2015.[7] On March 3, 2009, the U.S. Department of Transportation Office of Inspector General (DOT OIG) released a report[8] indicating that, while the FAA had made significant progress in improving RSAs, further action is needed. The DOT OIG report recommended that the FAA take action at 11 of the nation's largest airports, which includes Logan Airport. Logan Airport, certificated under 14 CFR Part 139, receives federal funding for airport improvement projects and is therefore federally obligated by FAA Order 5200.8[9] to meet the RSA design criteria contained in FAA AC 150/5300-13B, *Airport Design,* to the extent practicable.[10]

Logan Airport Runway 9-27 is 7,001 feet long and 150 feet wide. The FAA design standards require a standard RSA measuring 1,000 feet long beyond each end of the runway and 500 feet wide.[11] As shown in **Figure E.2-1**, the Runway 27 End (east end of Runway 9-27) is on the eastern edge of the airfield, adjacent to Boston Harbor. While the RSA at the west end of Runway 9-27 (Runway 9 End) meets the design requirement, the RSA at the

5 U.S. Department of Transportation, Federal Aviation Administration, Order 5100.38D, *Airport Improvement Program Handbook*, Change 1, February 26, 2019.
6 U.S. Code, Title 49, Subtitle VII, Part B, Chapter 471, Subchapter I, Section 47101 – Policies, (a) General (1).
7 Congressional Bill H.R. 3058: *Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia, and Independent Agencies Appropriations Act, 2006*; Public Law 109–115, November 30, 2005, 119 STAT. 2401.
8 U.S. Department of Transportation, Federal Aviation Administration, *Actions Taken and Needed to Improvement FAA's Runway Safety Area Program Report*, Report Number: AV-2009-039, March 3, 2009, https://www.oig.dot.gov/sites/default/files/11WEB_FILE_RSA_Report_03-3-09_Issued.pdf.
9 U.S. Department of Transportation, Federal Aviation Administration, Order 5200.8, *Runway Safety Area Program*, October 1, 1999.
10 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.
11 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, Runway Safety Area Determination, Appendix B, RSA Determination Form, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

east end (Runway 27 End) is only 150 feet long and therefore does not meet the RSA length requirement of 1,000 feet for a full-dimension RSA as specified in FAA AC 150/5300-13B (refer to **Figure E.2-2**).

Figure E.2-2 Runway 27 End – Existing Runway Safety Area

Like many established airports, Logan Airport today is subject to different design and safety standards than were in effect when airport facilities were constructed. In particular, the design criteria contained in FAA AC 150/5300-13B are a substantial upgrade over earlier standards. As the FAA's design criteria have evolved, Massport has continued to enhance its RSAs as part of an ongoing program of airfield safety improvements.

Previous improvements to the RSA at the Runway 27 End were made in 1992 through construction of an Inclined Safety Area (ISA), a graded crushed stone ramp into Boston Harbor (visible in **Figure E.2-2** east of the outlined 150-foot-long RSA). While the ISA provides some additional degree of safety, it does not meet the current RSA length requirements of 1,000-foot overrun or 600-foot undershoot protection. The ISA was installed prior to the formation of the FAA Runway Safety Area Program, the FAA's current RSA standards, and current technologies and research conducted by the FAA and the National Transportation Safety Board on runway safety improvements. Therefore, physical improvements to the Runway 27 End RSA remain needed.

Terrain, natural obstacles, and local development can limit the availability of land and make a full dimension RSA not practicable. Providing a full-dimension RSA is also challenging for runways that were constructed prior to the 1,000-foot-long RSA standard adopted about 20 years ago. To address these challenges, Engineered Materials Arresting System (EMAS) technology was invented to arrest overrunning aircraft and was approved by the FAA to be used in place of a full-dimension RSA. An EMAS is a bed of energy-absorbing material with predictable deceleration forces; it is either collapsible concrete blocks or foamed silica within a high-strength plastic mesh system covered with concrete.[12] In an emergency, when an aircraft rolls into an EMAS, the tires of

12 U.S. Department of Transportation, Federal Aviation Administration, "Engineered Material Arresting System (EMAS)," updated January 5, 2022, https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=13754.

the aircraft collapse the energy-absorbing material, and the aircraft is slowed down in a way that minimizes damage to the aircraft and potential injuries to passengers and crew members. An EMAS is often used when a full-dimension RSA is not possible due to lack of available land or to minimize environmental impacts. An EMAS provides an FAA-approved level of safety that is equivalent to a full-dimension RSA.[13]

2.1 Alternatives Considered

In 2017, the FAA directed Massport to conduct a *Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study* to determine feasible and reasonable alternatives to bring the Runway 27 End RSA into compliance.[14] Six build alternatives and the No-Build Alternative were evaluated in the Tier 1 Alternatives Screening, as summarized in **Table E.2-2**. The RIM Study is included as Appendix B.

Table E.2-2 Tier 1 Alternatives Screening Results

	Alternative						
Screening Criteria	**1 Declared Distances[1]**	**2 Displaced Thresholds**	**3A Full RSA, Fill**	**3B Full RSA, Deck**	**4A EMAS on 500' Deck**	**4B EMAS on 306' Deck**	**No-Build**
Provide overrun and undershoot protection for aircraft consistent with FAA design criteria	●	●	●	●	●	●	●
Preserve airfield utility and efficiency	●	●	●	●	●	●	●
Retain perimeter road	●	●	●	●	●	●	●
Avoid triggering runway injunction requirements	●	●	●	●	●	●	●
Avoid impacts to the navigation channel	●	●	●	●	●	●	●
Avoid and minimize environmental impacts	●	●	●	●	●	●	●

Key:
● Green indicates the criterion is met and/or no negative effect is anticipated; the alternative is favorable in comparison to the other alternatives.
● Orange indicates the criterion is partially met and/or there is some negative effect anticipated.
● Red indicates the criterion is not met and/or a negative effect is anticipated; the alternative is not favorable in comparison to the other alternatives.

1 Although RSA Alternative 1 scored positively against several of the screening criteria, it would adversely affect airfield operations and pose significant takeoff limitations.

Source: U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B, *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

Based on the findings of the RIM Study, the FAA concluded that Alternative 4B, which consists of an EMAS on a 306-foot-wide deck, was the Preferred Alternative. A No-Build Alternative was also carried forward as part of the environmental review process, per MEPA requirements.

A second-tier alternatives evaluation was conducted to determine the appropriate deck support structure. Two types of support structures were considered: piles and caissons/drilled shafts. Piles are long, circular or square

13 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.
14 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B, *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

driving). Caissons, which are circular columns typically much larger than piles, would involve drilling a hole into the bedrock into which structural steel would be placed and concrete pumped to form a column.

Four alternatives for supporting the RSA deck at the end of Runway 27 were identified and evaluated, as summarized in **Table E.2-3.**

Table E.2-3 Tier 2 Screening Results of Deck Support Alternatives

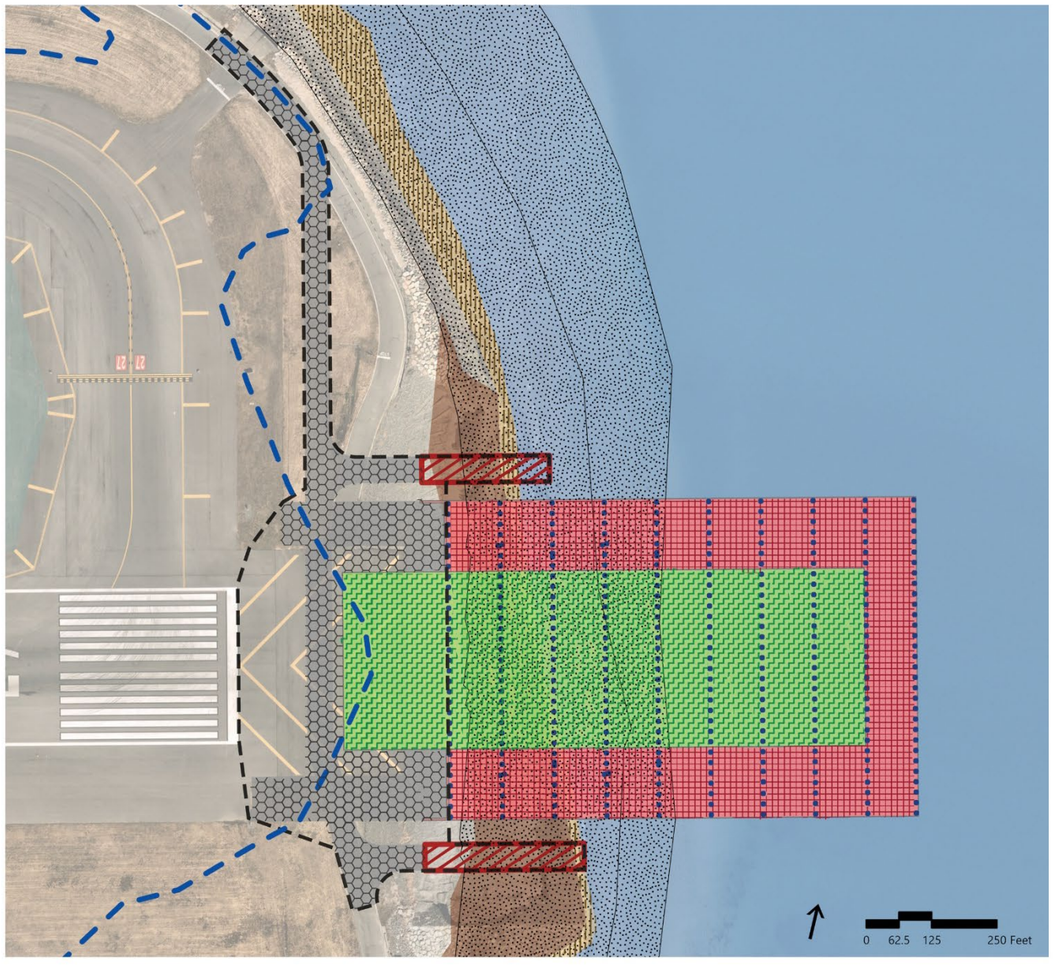
Screening Criteria	Deck Support Alternatives			
	Alternative 1: 416 Piles	Alternative 2: 326 Piles	Alternative 3: 160 Caissons	Alternative 4: 128 Caissons
Coastal Wetlands Resource Area Impact:				
Permanent total footprint of piles/caissons (total square feet)	1,160	910	3,140	2,510
Permanent total scour (total cubic yards)	380	340	1,060	1,120
Runway Closure/Airfield Disruption: Can construction be completed in 120 days or less?	No	Yes	No	No

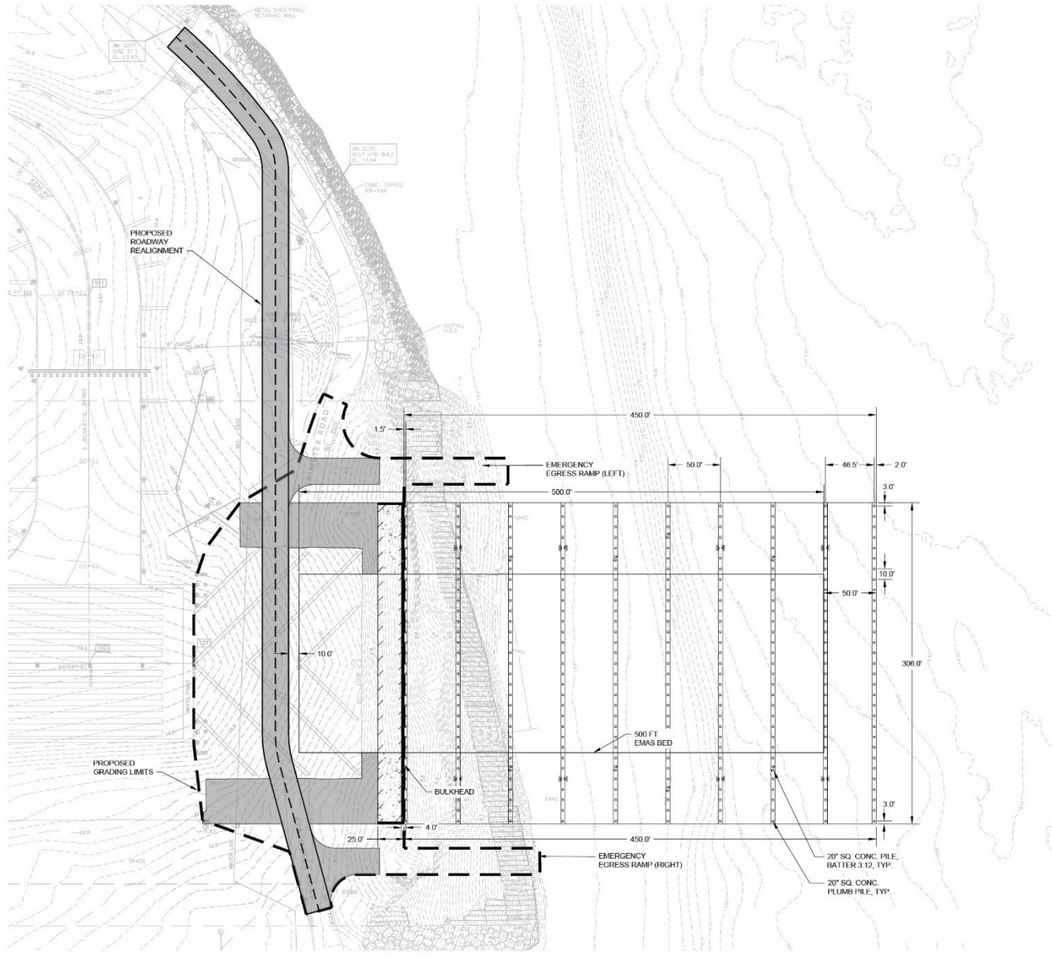
The analysis found that Deck Support Alternative 2 would have the least impact on environmental resources and could be constructed with the least operational impacts to the airfield. Deck Support Alternative 2 was carried forward as the Proposed Project for further analysis, along with the No-Build Alternative.

2.2 Summary of Proposed Improvements

As shown in **Figure E.2-3**, the Project would construct a 650-foot-long RSA with an EMAS on a pile-supported deck (approximately 450 feet long by 306 feet wide). The Project would consist of the following components:

- Extend the existing Runway 27 End RSA to accommodate a steel sheet pile wall at the inshore limit of the deck to prevent settlement and erosion of the upland areas;
- Install a transition slab spanning from the land to the pile-supported structure;
- Install a deck structure approximately 450 feet long and 306 feet wide (an area of approximately 137,700 square feet [3.2 acres]), supported by 326 twenty-inch square concrete piles;
- Install an EMAS approximately 500-feet long by 170-feet wide located within the RSA deck;
- Straighten and realign the existing 20-foot-wide airport perimeter road to enhance vehicular sight lines and situational awareness;
- Install two emergency access ramps, one on each side of the proposed deck;
- Add life rings on the sides and end of the deck to enhance access in and out of the water in an emergency; and
- Install safety railings along the sides and end of the proposed RSA deck.





326 20-Inch Square Concrete Piles

The pile configuration includes:

- 326 total piles (294 vertical piles and 32 batter piles)
- 20-inch square concrete piles driven to rock in 10 bents[1] of 31 piles each
- Bents spaced 50 feet apart and piles within each bent spaced 11 feet apart

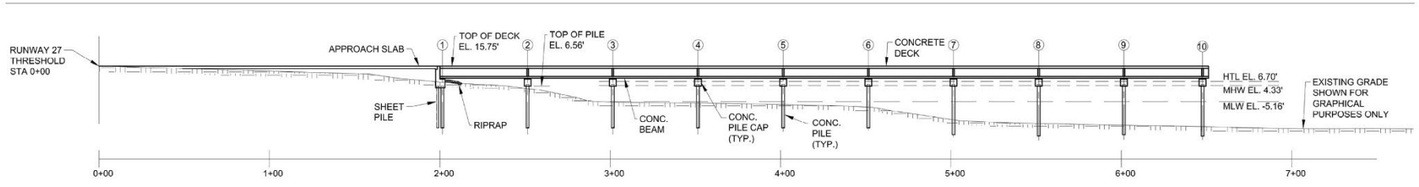


FIGURE E.2-3: RSA Deck Support Alternative 2 **Runway 27 End RSA Improvements Project**

Proposed Grading Limits
Proposed Pile-Supported Deck
Proposed Engineered Materials Arresting System (EMAS) Bed
Proposed Pavement
Proposed Piles
Proposed Approach Slab
Proposed Emergency Ramp
Coastal Beach
Land Under Ocean
Land Subject to Tidal Action
Federal Emergency Management Agency (FEMA) 100-Year Flood Level
Land Containing Shellfish

1 A bent is an array of piles in a row and fastened together at the top by a pile cap.

\\rhbglbl\proj\Wat-EV\14792.00 WSP - MPA Runway 9-27\Reports\DEIR-EA\Drafts\Figures

This Page Intentionally Left Blank

3 Compliance with CZM Program Policies

The proposed Runway 27 End RSA Improvements Project and associated mitigation would be designed and constructed in compliance with the program policies of the federally approved Massachusetts CZM Coastal Zone Management Program set forth in 301 CMR 20.00. The CZM Policy Guide is the official statement of the Massachusetts coastal program policies and legal authorities, especially as they relate to the process of federal consistency review.[15] These program policies provide the legal frame of reference for project reviews undertaken by CZM and also inform non-regulatory aspects of other programs. A subset of these policies is known as the CZM enforceable program policies. Per 16 U.S. Code Section 1453, "The term "enforceable policy" means State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone."[16] Proponents must demonstrate that projects subject to federal consistency review are consistent with these policies. **Table E.2-4** presents the CZM enforceable program policies and identifies which polices are applicable to the proposed Runway 27 End RSA Improvements Project.

Table E.2-4 Enforceable Program Policies

Enforceable Program Policy	Applicability
Coastal Hazards Policy 1	**Applicable**
Coastal Hazards Policy 2	**Applicable**
Coastal Hazards Policy 3	**Applicable**
Energy Policy 1	Not applicable; the Proposed Project is not for the development or siting of an energy facility.
Habitat Policy 1	**Applicable**
Habitat Policy 2	**Applicable**
Ocean Resources Policy 1	Not applicable; aquaculture is not proposed as part of the Project.
Ocean Resources Policy 2	Not applicable; the Proposed Project does not involve the extraction of oil, natural gas, or marine minerals.
Ocean Resources Policy 3	Not applicable; offshore sand and gravel extraction are not proposed as part of the Project.

15 Massachusetts Office of Coastal Zone Management, Policy Guide, page 18, October 2011.
16 U.S. Code, Title 16 – Conservation, Chapter 33 – Coastal Zone Management, Section 1453 Definitions, (6a), 2020.

Enforceable Program Policy	Applicability
Ports and Harbors Policy 1	Not applicable, the Proposed Project does not include dredging or disposal of dredged material associated with a navigation improvement project.
Ports and Harbors Policy 2	Not applicable; the Proposed Project does not include channel dredging.
Ports and Harbors Policy 3	Not applicable; the Proposed Project is not within a Commonwealth Designated Port Area (DPA).
Ports and Harbors Policy 4	**Applicable**
Protected Areas Policy 1	Not applicable; no work is proposed in a Massachusetts Area of Critical Environmental Concern (ACEC).
Protected Areas Policy 2	Not applicable; no designated Scenic and Recreational Rivers and Streams of the Commonwealth are in the vicinity of the Proposed Project.
Protected Areas Policy 3	Not applicable; the Proposed Project is not in or near a designated or registered historic district or site.
Public Access Policy 1	Not applicable; the Proposed Project is within a site where public access is prohibited and is not near any public recreation sites.
Water Quality Policy 1	**Applicable**; there are no new point-source discharges proposed.
Water Quality Policy 2	**Applicable**
Water Quality Policy 3	Not applicable; there are no subsurface waste discharges proposed.

Source: Massachusetts Office of Coastal Zone Management, Policy Guide, October 2011.

The following sections describe the CZM's enforceable program policies and the associated authorizing legislation that are applicable to the Project and explains how the Proposed Project is consistent with these policies.

3.1 Coastal Hazard Policy 1

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

The CZM implements the Coastal Hazard Policy 1 through technical assistance to project proponents and to other public agencies and review of projects proposed on coastal landforms. The proposed Runway 27 End RSA Improvements Project would not affect the flood control or storm damage functions of the coastal bank at the Runway 27 End.

The proposed Runway 27 End RSA Improvements Project, including the pile-supported deck, would not have any effect on the stability of the man-made shoreline. The existing placed stone and riprap shoreline stabilization north and south of the Project Site contribute to the stability of the shoreline and would continue to contribute to the prevention of storm damage and flooding. A new sheet steel bulkhead at the landward edge of the RSA deck at the top of the coastal bank would help stabilize the shoreline and prevent erosion.

3.2 Coastal Hazard Policy 2

Ensure construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Approve permits for flood or erosion control projects only when it has been determined that there will be no significant adverse effects on the project site or adjacent or downcoast areas.

Design and construction of solid fill piers, bulkheads, groins, jetties, revetments, or other permanent structures in coastal waters will be examined by CZM to determine:

- *The Project's alteration of wave- or tide-generated sediment transport at the project site or on adjacent or downcoast areas (of particular concern are significant adverse changes in depositional patterns or natural storm damage prevention or buffering functions);*
- *Alterations to bottom topography that may result in increased storm damage or erosion of coastal beaches, coastal banks, coastal dunes, or salt marshes;*
- *Sediment transport processes that may increase flood or erosion hazards by affecting the natural replenishment of beaches; and*
- *Erosion rates and the form and volume of adjacent or downdrift beaches; and Littoral drift volumes and patterns, as well as flushing rates and discharge capacity in estuaries and coastal embayments.*

The proposed Runway 27 End RSA Improvements are not part of a flood or erosion control project. The construction of the proposed pile-supported deck structure at the Runway 27 End is not a solid fill structure. The deck supports may have a minor change to coastal processes. Currents in the vicinity of the deck would not be significantly altered and only negligible erosion may occur at the pilings. The two proposed emergency access ramps are solid fill structures, but these structures would not affect coastal processes. The proposed ramps would be constructed primarily within the existing crushed rock ISA (refer to **Figure E.2-3**). The crushed rock area surrounding the proposed ramps is designed not to be easily erodible or transportable material and it has remained stable for nearly 30 years. Impacts would be localized and generally affect the area under the deck and along the immediately adjacent shoreline. The Project Site is not a source or fine-grained sediment that could erode or be transported to replenish nearby beaches. The proposed pile-supported deck design, in addition to substantially reducing fill, seeks to minimize changes to coastal processes.

The proposed pile-supported deck was evaluated to determine if it could cause localized scour impacts over time resulting from water movement around the piles underneath the deck within the Land Under the Ocean. A study of the potential sediment transport and scour impacts due to the construction of the proposed pile-supported RSA deck was conducted. The modeling analysis focused on the local seabed and nearby shorelines of Snake Island, and the Cottage Park and Winthrop Yacht Clubs. The study used available seabed mapping and two months of site-specific tidal and current modeling. As velocity (of the water) and bed shear stress (pressure exerted along the seabed surface) are core attributes to the processes of sediment transport and scour (i.e., increased bed sheer stress and velocity indicate increased sediment transport capacity and scour conditions), a model was developed to evaluate these two parameters under existing conditions as compared to proposed conditions.

Based on the coastal modeling results, there are no appreciable changes to the movement of sediments at the Project Site, and none anticipated for Snake Island, or the Cottage Park or Winthrop Yacht Clubs. By adding an array of deck support piles, the RSA deck was projected to result in a small increase in the velocity of the water.

However, the values are well below the critical velocity and bed shear stress values required to result in movement of the seabed material. The maximum velocities in the vicinity of the Project Site are 0.116 meters per second (or 0.226 knots) for the existing condition compared to 0.212 meters per second (or 0.412 knots) for the proposed condition. These values are well below the critical velocity value of 0.69 meters per second (or 1.34 knots). Similarly, the model predicted minor increases in bed shear stresses. The maximum shear stresses in the vicinity of the Proposed Project are 0.025 Pascals (0.0005 pounds per square foot) for the existing condition and would be 0.199 Pascals (0.0004 pounds per square foot) for the proposed condition. Based on the properties of the seabed material, the critical shear stress required to move the existing seabed material would be 2.24 to 2.33 Pascals (0.047-0.049 pounds per square foot), which is an order-of-magnitude higher than the predicted increase in bed shear stress under the proposed condition.

3.3 Coastal Hazard Policy 3

Ensure that state and federally funded public works projects proposed for location within the coastal zone will:

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

The Coastal Hazard Policy 3 is aimed at ensuring the soundness of public investment for public works projects in hazardous coastal areas. The CZM implements the policy through technical assistance to project proponents and to other public agencies.

The proposed pile-supported deck at the Runway 27 End has been designed to withstand flood and erosion related damage as it would be elevated above the annual high tide line (Elevation 6.7 feet), thereby diminishing damage from erosion. The emergency access ramps would be stable structures reinforced by riprap.

The Project Site is within a hazard prone area and a velocity zone but has been designed to withstand the forces that can reasonably be anticipated. The safety project would not be promoting additional growth or development by creating support for other development (like a public road) in the coastal zone.

3.4 Habitat Policy 1

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

The CZM implements Habitat Policy 1 policy through participation in and review of the Massachusetts Wetlands Protection Act (WPA), the Clean Water Act (CWA) 401 Water Quality Certification, the Chapter 91 License program, and the Massachusetts Endangered Species Act. Coastal Beach, Coastal Bank, and Land Under the Ocean wetlands resources will be protected through careful design of the Project. Minor impacts to shellfish

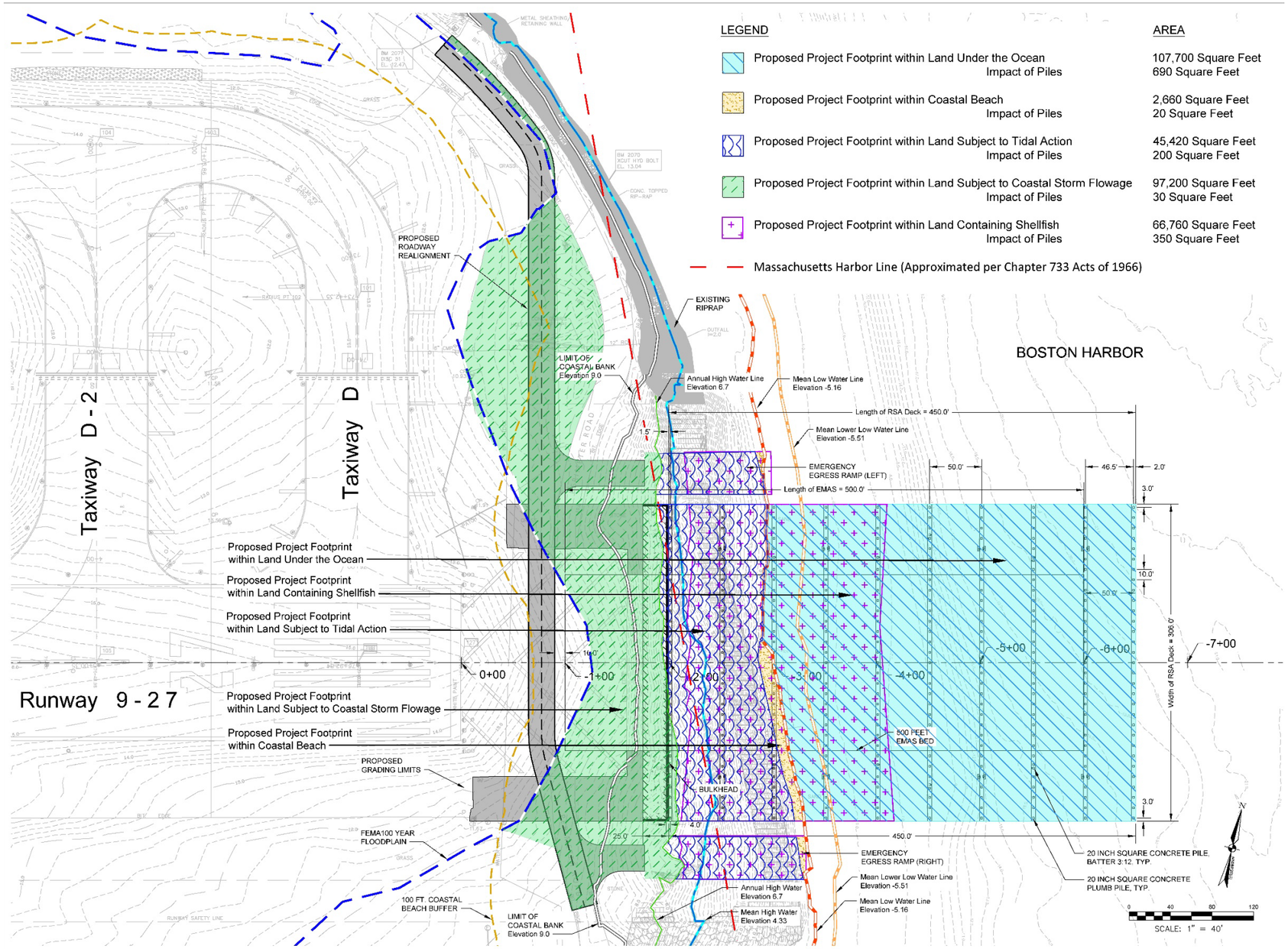
beds are unavoidable to accomplish the safety goals. Massport would mitigate for the loss of these resources and work collaboratively with the DMF and the USACE to develop an appropriate mitigation plan during project permitting. The proposed Runway 27 End RSA Improvements Project would comply with the policy.

At the Runway 27 End, there are no salt marshes, dunes, barrier beaches, salt ponds, or freshwater wetlands. The resources present at the Runway 27 End are shellfish beds supporting soft shell clams (*Mya arenaria*), razor clams (*Ensis directus*), surf clams (*Spisula solidissima*), and blue mussel (*Mytilus edulis*). The proposed Runway 27 End RSA Improvements Project would have unavoidable impacts to shellfish beds present at the runway end. Of about 58,130 square feet of Land Containing Shellfish, the proposed pile driving would impact approximately 350 square feet or less than one percent of the available habitat. Based on the low density of soft-shell clams present and the small area impacted by the deck piles, the impact to Land Containing Shellfish would not be significant (**Figure E.2-4**). Impacts to mussel beds are approximately 900 square feet of direct impact from construction of the emergency egress ramp on the north side of the RSA deck and shading to approximately 1,460 square feet of the northern mussel bed and the small cluster of mussels near the center of the RSA deck. The mussel bed on the south side of the RSA deck would not be impacted.

As noted above, Massport will work with DMF and USACE to mitigate for these unavoidable impacts. The DMF has determined that due to the low numbers of clam individuals, recovery, and relocation of clams from the impact area is not warranted. Rather, the DMF has suggested as mitigation that Massport contribute to their shellfish restoration program. Massport anticipates the USACE will require in-lieu fee payment as mitigation for impact to mud flat and subtidal seabed from the deck piles and emergency egress ramps. Additionally, Massport proposes a wetland mitigation goal of 1:1 restoration or replacement of 1,200 square feet of filled wetland area (piles and emergency egress ramps) via construction or restoration of mud flat based on current USACE and MassDEP guidance. In close coordination with the resource agencies, mud flat mitigation is expected to be provided in the form of shoreline restoration within Boston Harbor/Chelsea Creek or could involve mud flat creation similar to what Massport previously conducted to offset impacts associated from the Runway 33L End RSA project at Rumney Marsh in Saugus, Massachusetts. These mitigation measures will be developed during the permitting phase of the Project.

Page Left Intentionally Blank.

Figure E.2-4 Coastal Resources Located within the Project Site



This Page Intentionally Left Blank

The Runway 27 End RSA Improvements Project would also impact upland grassland habitat for upland sandpiper (*Bartramia longicauda*) and Eastern meadowlark (*Sturnella magna*) (**Figure E.2-5**); species that are state-listed as endangered or species of special concern, respectively. Approximately 20,300 square feet of grassland would be lost primarily from the realignment of the perimeter roadway (refer to **Figure E.2-4**). Massport will work with Massachusetts Natural Heritage and Endangered Species Program (NHESP) during permitting to offset any reductions in this grassland habitat by removing excess pavement elsewhere on the airfield and reestablishing those areas with a grass mix approved by the U.S. Department of Agriculture (USDA) and the NHESP.

The impacts to shellfish beds or upland grassland habitat will not compromise the ability of the coastal area to provide critical wildlife habitat functions, nutrient and sediment attenuation, wave and storm damage protection, or landform movement and processes. There are no anticipated permanent impacts to wildlife as the loss of habitat is minor. Wildlife can use similar habitat on Airport property or elsewhere in Boston Harbor. The proposed RSA improvements would not prevent the coastal resources from providing nutrient and sediment attenuation. The proposed improvements would not create a barrier to nutrient or sediment attenuation. The impacts are a small percentage of the entire resource available in the vicinity to perform the same function. The RSA improvements would not impact the ability of the coastal resources to provide wave and storm damage protection and would benefit wave and storm damage protection through the installation of a bulkhead providing the shoreline increased stability and erosion prevention. The existing coastal resources do not contribute to landform movement and processes and therefore would not be impacted by the proposed RSA improvements.

Massport would provide mitigation for the unavoidable impacts that would occur from the Project and the construction of the proposed RSA pile-supported deck is anticipated to enhance habitat used by blue mussels and other bivalves by reducing exposure to sunlight (desiccation) and by providing new hard substrate area (pilings). The shellfish mitigation commitments will be finalized with the DMF during the Project permitting.

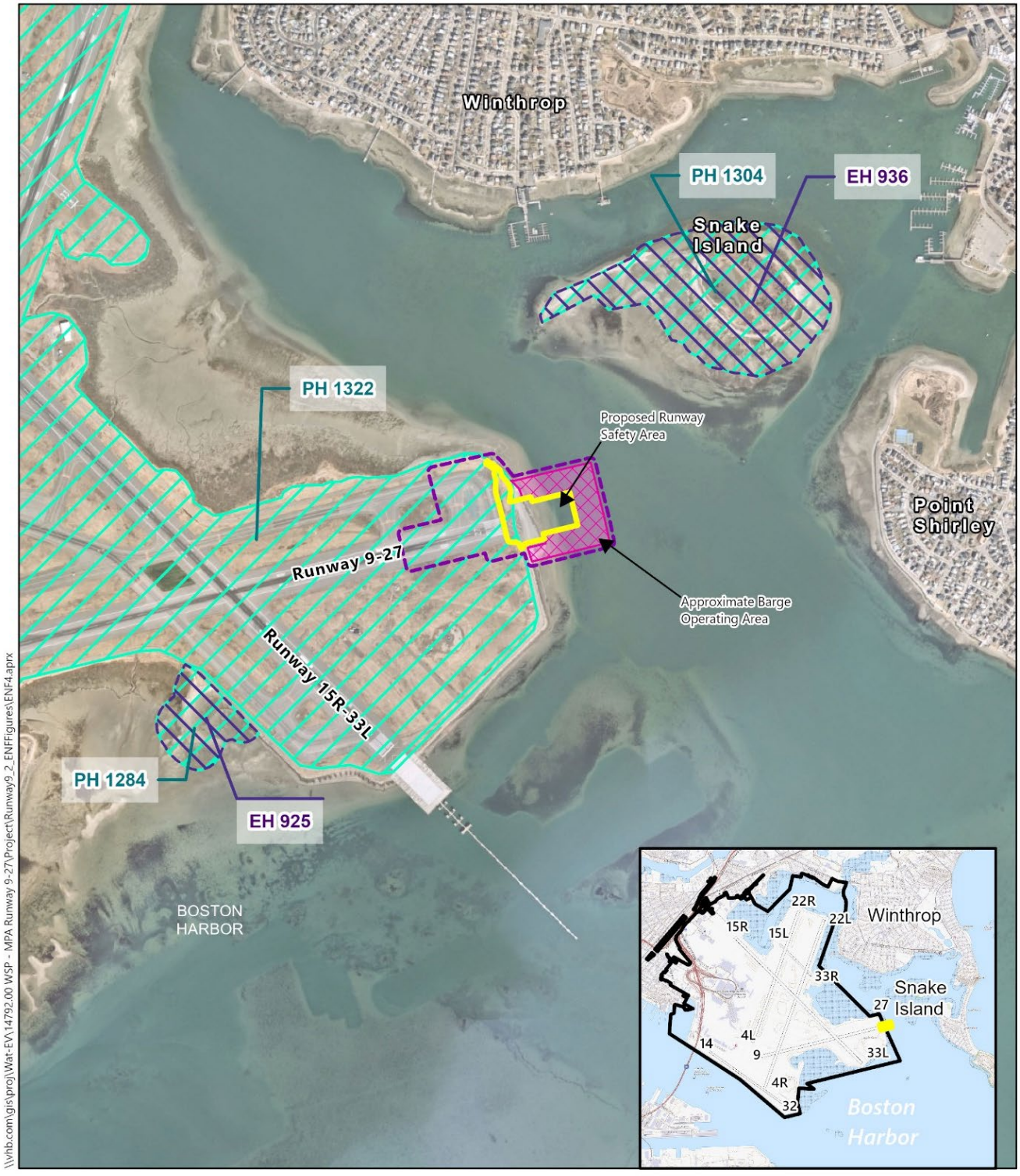


FIGURE E.2-5: NHESP Resource Areas **Runway 27 End RSA Improvements Project**

Proposed Project Site
Study Area
Approximate Barge Operating Area
Natural Heritage & Endangered Species Program Estimated Habitat
Natural Heritage & Endangered Species Program Priority Habitat

0 600 1200 2400 Feet

Sources: VHB 2021, ESRI, Nearmap Imagery March 2022, MassGIS: NHESP 2021

3.5 Habitat Policy 2

Restore degraded or former wetland resources in coastal areas and ensure that activities in coastal areas do not further wetland degradation but instead take advantage of opportunities to engage in wetland restoration.

The CZM implements Habitat Policy 2 through participation in and review of the WPA and CWA 401 Water Quality Certification programs. Survey of the Project Site determined that the nearest area of salt marsh is approximately 800 feet to the north, around the corner of the shoreline and well removed from the in-water construction area. The subtidal portions of the Project Site were investigated for the presence of eelgrass or submerged aquatic vegetation (SAV) using side scan sonar and underwater video (**Figure E.2-6**). No SAV was identified within or near the Project Site. Therefore, with the appropriate construction measures, the Proposed Project would not impact or degrade any vegetated coastal wetlands such as salt marsh or SAV.

3.6 Ports and Harbors Policy 4

For development on tidelands and other coastal waterways, preserve and enhance the immediate waterfront for vessel-related activities that require sufficient space and suitable facilities along the water's edge for operational purposes.

The Project Site is within Logan Airport property on the secured airfield in an area where public access in the coastal zone is restricted and highly regulated. The waterfront adjacent to the Project Site is not available for water dependent or vessel related activities development (**Figure E.2-7**). The Massachusetts Legislature has recognized the paramount importance of maintaining safety and security of Logan Airport and Logan Airport's waterside perimeter, as indicated in M.G.L. Chapter 91, Section 61. By virtue of M.G.L. Chapter 90, Section 61, the public rights that typically exist in flowed and submerged tidelands have been either completely extinguished or greatly curtailed within the Logan Airport Security Zone. The Logan Airport Security Zone extends 500 feet seaward of and parallel to the Mean High Water (MHW) line at Logan Airport.[17] With extremely limited exceptions and subject in all events to Massport's oversight and permission, public access is not permitted within the Logan Airport Security Zone.

Non-airport-related activity is generally prohibited within the inner 250 feet of the Logan Airport Security Zone. Boating is conditionally permitted within the outer 250 feet of the Logan Airport Security Zone. Limited shellfishing authorized by the DMF is the only non-airport-related activity permissible within the Logan Airport Security Zone, which is regulated and authorized by Massport. Badged shellfishers are allowed to access the shellfish beds around Logan Airport for clamming purposes and that will continue after the Project is completed. Currently, with low densities of softshell clams in Boston Harbor, there are only five badged shellfishers. No other public access is permitted within the legislated Logan Airport security zone which is 500 feet seaward of the MHW line (refer to **Figure E.2-7**).

17 Massachusetts General Law, Chapter 90, Section 61(a).

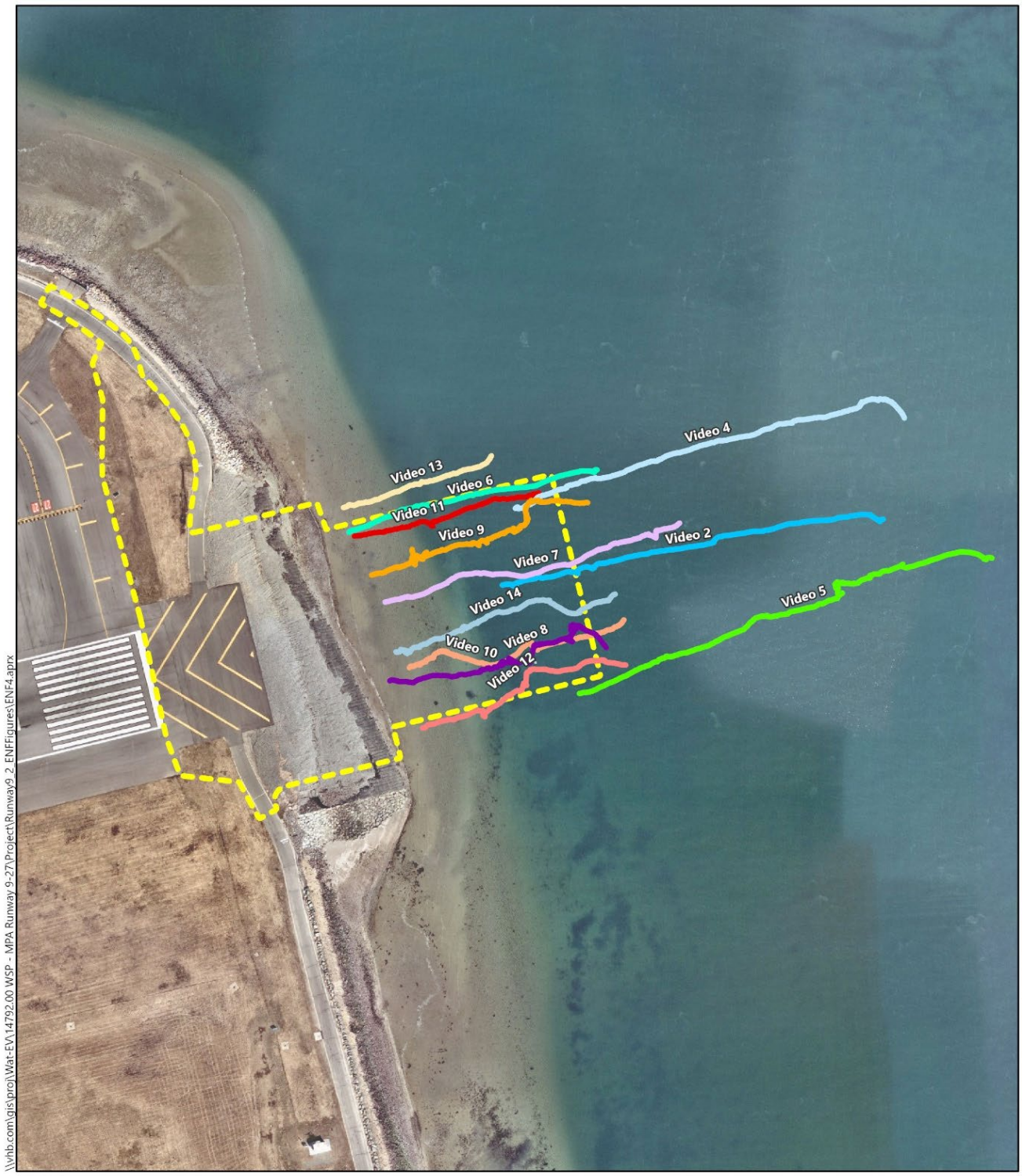


FIGURE E.2-6: Video Tracks for Eelgrass Survey (June 10, 2021)

Runway 27 End RSA Improvements Project

Proposed Project Site

Video Tracks

Video 2
Video 4
Video 5
Video 6
Video 7
Video 8
Video 9
Video 10
Video 11
Video 12
Video 13
Video 14

0 100 200 400 Feet

Sources: CR Environmental June 10, 2021, Nearmap Imagery March 2022

Figure E.2-7: Environmental Resource Areas **Runway 27 End RSA Improvements Project**

Sources: WSP, VHB, NOAA 2021, FIRM Panel Number 25025C0101J, Effective Date 3/16/2016, Nearmap Imagery March 2022 Massachusetts Bureau of Geographic Information, MassGIS Data: Shellfish Suitability Areas, May 2011.

3.7 Water Quality Policy 1

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

There are airfield stormwater outfalls on either side of the Project Site. Stormwater runoff from the Project will either enter one of these existing closed systems and be discharged through the outfall or by overland flow drainage. The stormwater runoff from the proposed RSA deck would enter scuppers along each side of the deck and discharge directly to Boston Harbor. The Project Site consists of the RSA deck that would not receive maintenance during winter months other than blowing snow off the EMAS. The RSA deck would not be treated and would not be used by motor vehicles except during maintenance activities or emergency situations. Therefore, any runoff from the RSA deck would be considered clean water consistent with how roof runoff is considered in the Massachusetts Stormwater Management Standards. Massport will evaluate stormwater runoff treatment features during the final design of the Project for suitable measures that may be installed in the vicinity of the Project.

Low motor vehicle traffic use of the perimeter road would not change due to the Proposed Project. Maintenance of the perimeter road includes weekly sweeping throughout the year and during the winter, environmentally friendly deicing agents (sodium acetate) are used only as needed. The realigned perimeter road and additional pavement for the proposed RSA deck and approach slab would add approximately 3.8 acres of impervious area (refer to **Table E.2-5**). Since the runoff would drain to tidal waters, rate control is not a concern.

Table E.2-5 Proposed Stormwater Management

Element	Existing Cover Type	New Impervious Area	Stormwater Management
RSA Deck [1]	Open Water	3.3 acres	Drains to Boston Harbor through scuppers distributed along edges of deck
RSA Approach Slab and Perimeter Road	Pavement (perimeter road), grass infield, concrete, and riprap slope	0.5 acres	Drain to Boston Harbor via overland flow or existing catch basins to outfalls

1 Runways, taxiways, safety areas, and aprons of the airfield generate negligible amounts of contaminants or suspended solids, because these areas are not typically sanded and convey limited vehicular traffic which consists only of safety and maintenance equipment.

3.8 Water Quality Policy 2

Ensure that nonpoint source (NPS) pollution controls promote the attainment of state surface water quality standards in the coastal zone.

The CZM implements Water Quality Policy 2 through the provisions of the following statutes and regulations that are applicable to the proposed Runway 27 End RSA Improvements Project:

- Clean Water Act 401 Water Quality Certification;
- Massachusetts Surface Water Quality Standards (314 CMR 4.00);
- WPA (M.G.L. c. 131, Section 40) and Regulations (310 CMR 10.00); and
- Massachusetts Stormwater Management Standards (part of WPA regulations).

The Proposed Project is anticipated to require a Water Quality Certificate (WQC). The final design of the Project will establish the extent of impacts and determine if a WQC for both filling and dredging is required.

Rain that falls on the surface of the proposed Runway 27 End RSA deck would not result in an increase of runoff volume to the Harbor and would not be detained. The runoff would be directly discharged to the Harbor, closely matching the existing hydrology of the site and would not increase freshwater inputs to the habitat. Stormwater runoff from the deck is anticipated to be collected by scuppers located along the edges of the deck. It is assumed that these scuppers would convey runoff from the surface through the deck and would direct flows away from the supporting structure. From a construction perspective, the proposed deck and pilings closely resemble a bridge. Stormwater runoff from the deck would not erode sediments adjacent to the deck because discharge would be connected to trunk lines to carry the runoff to the outer end of the deck to be released into deep water (17 to 22 feet deep). Discharge would not fall onto exposed coastal beach or mud flats during any tide cycle).

Two emergency access ramps are proposed as part of the Project – one on either side of the proposed deck. Because the emergency access ramps would likely consist of concrete mats over a compacted gravel bed, negligible amounts of runoff would be expected to occur, even during rainfall events that coincide with low tide. Other than first responders attending to an airplane accident, the emergency access ramps would not receive any vehicular traffic. No total suspended solid (TSS) or other pollutants would be generated or captured by the emergency access ramps other than through the normal atmospheric deposition.

The National Pollutant Discharge Elimination System (NPDES) permit regulates stormwater discharges from all Logan Airport outfalls. The Proposed Project would be in the Airfield Outfall Drainage Area. The Airfield Outfall Drainage Area consists of a closed conveyance system that includes catch basins and pipes to convey stormwater from runways, taxiways, and the perimeter roadway (approximately 910 acres) to Airfield Outfalls A-1 through A-44 discharging into Boston Harbor (see **Figure E.2-8**). The open stormwater system uses the airfield's grass swales and open channels to infiltrate stormwater from runway surfaces.

The industrial activities conducted at the airport include, but are not limited to, aircraft and runway deicing, aircraft and vehicle fueling, aircraft and vehicle maintenance, lavatory waste handling, runway rubber removal. Massport and its Co-Permittees are subject to an extensive Stormwater Pollution Prevention Plan (SWPPP) which contains Best Management Practices (BMPs) that are designed to address all activities at the airport and minimize the discharge of pollutants from such activities. The SWPPP is updated every year. The Logan Airport SWPPP addresses stormwater pollutants, including deicing and anti-icing chemicals, bacteria, fuel and oil, and other sources of stormwater pollutants. BMPs specific to aviation activities are included in the SWPPP. In accordance with the other requirements of the NPDES permit, Massport conducts training for personnel responsible for implementing activities identified in the SWPPP.

FIGURE E.2-8: Stormwater Outfalls and Associated Drainage Areas

Runway 27 End RSA Improvements Project

Proposed Project Site
Drainage Area
Fire Training Facility Outfall
Airfield Stormwater Outfalls

0 900 1800 3600 Feet

Sources: WSP, Nearmap Imagery March 2022

The proposed relocated perimeter roadway is in an upland portion of the Airport. The existing closed drainage system in the upland area consists of a series of catch basins and pipes with limited drainage areas which discharge to separate outfalls. Outfalls A-25, A-26, and A-27 discharge stormwater flows from portions of the end of Runway 27 to the west-southwest, northwest, and east (**Figure E.2-8**). The construction of the upland portion of the proposed Runway 27 End RSA would result in minor changes to stormwater runoff by adding impervious area (0.5 acres) in upland areas that are currently pervious (refer to **Table E.2-5**). The increase of impervious area will be offset by removal of pavement in other locations on the airfield. Runoff from the new impervious pavement associated with the relocated perimeter road and the runway approach and shoulders will sheet flow onto adjacent grassed or crushed stone surfaces. Water will be allowed to infiltrate in these pervious areas or may runoff overland to Boston Harbor. A stormwater collection system of scuppers along the sides of the RSA deck will be sized to collect flows from the 10-year storm event as required under State standards. The scuppers will be connected to trunk lines to carry the runoff to the outer end of the proposed deck to be released into deep water (17 to 22 feet deep). Overland sheet flow from the RSA and adjacent areas do not constitute regulated discharges under the NPDES permit. Because the shoreline is protected from erosion with riprap and the crushed rock ISA and the runoff from these areas contains negligible quantities of pollutants, these changes are not anticipated to impact wetland resources. The perimeter roadway receives comparably little vehicular traffic, is swept frequently, and is de-iced with sodium acetate as necessary during winter. These management practices would continue following the construction of the proposed Runway 27 End RSA Improvements Project. All outfalls will continue to be regulated under the Airport's existing NPDES permit. Stormwater sampling of the airfield outfalls is an ongoing requirement of the NPDES permit and would continue following the construction of the RSA.

The runways, taxiways, safety areas, and aprons of the airfield generate negligible amounts of contaminants or suspended solids, because these areas are not typically sanded and convey limited vehicular traffic which consists only of safety, security, and maintenance equipment. Due to its crushable composition, the proposed EMAS would not be accessed by vehicles other than during an emergency or maintenance activities. There is a negligible contribution of nutrients to the receiving waters because no fertilizers are used on airfield grassed areas. Frequent sweeping of the paved portions of the airfield further reduces the quantity of sediments that are available for transport by stormwater runoff.

Rates of atmospheric deposition of pollutants would not be altered by the construction of the proposed Runway 27 End RSA Improvements. The majority of the increased impervious surfaces would occur as the result of the construction of the EMAS and deck. Under existing conditions, the area is open water and currently receives direct deposition of air-borne pollutants. Following construction of the deck, the same quantity of air-borne pollutants would be deposited and temporarily captured by the deck. These pollutants would be washed off the deck into Boston Harbor by rain events, rather than falling directly into Boston Harbor as it does under existing conditions.

Management of snow and ice within the airfield is a critical component of airport operations. Logan Airport is prohibited from disposing snow into Boston Harbor except under very limited emergency situations and with prior approval. Snow is removed from runways and perimeter roads onto the grassed infield areas as soon as possible after it has fallen. De-icing is performed with potassium acetate (runways and taxiways) and sodium acetate (RSAs and roadways). Sodium acetate is used for traction control and de-icing on the perimeter roadways, which does not generate suspended solids or water pollutants. Because sodium acetate dissolves completely once applied, the practice does not generate sediment. Snow management operations result in

negligible impacts to water quality and are performed in accordance with the SWPPP and the NPDES discharge permit.

The Runway 27 End RSA, because of the unique safety requirements of the FAA and unique characteristics of Logan Airport (which is located in Boston Harbor, with tidally influenced fill materials), presents challenges to constructing these safety improvements in compliance with the Massachusetts Stormwater Standards 3, 4, and 6. However, because the proposed pile-supported RSA deck would not generate stormwater pollutants other than through atmospheric deposition, the Proposed Project is not anticipated to adversely affect water quality or groundwater supply. Massport will evaluate stormwater runoff treatment features during the final design of the Project for suitable measures that may be installed in the vicinity of the Project.

E.3- RMAT Output Report

This Page Intentionally Left Blank.

Climate Resilience Design Standards Tool Project Report

Logan Airport Runway 27 End RSA Improvements Project
Date Created: 10/17/2022 4:32:32 PM
Created By: jgoldberg
Date Report Generated: 10/18/2022 1:34:15 PM
Tool Version: Version 1.2
Project Contact Information: Stewart Dalzell (sdalzell@massport.com)

Project Summary

Link to Project

Estimated Capital Cost: $110000000.00
End of Useful Life Year: 2100
Project within mapped Environmental Justice neighborhood: Yes

Ecosystem Service Benefits	Scores
Project Score	Low
Exposure	**Scores**
Sea Level Rise/Storm Surge	High Exposure
Extreme Precipitation - Urban Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	Not Exposed
Extreme Heat	High Exposure

Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Urban Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Runway Safety Area & Deck	High Risk	High Risk	Low Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Runway Safety Area & Deck	2070	2050		200-yr (0.5%)	
Extreme Precipitation					
Runway Safety Area & Deck	2070			50-yr (2%)	Tier 3
Extreme Heat					
Runway Safety Area & Deck	2070		50th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "High Exposure" because of the following:

- Located within the predicted mean high water shoreline by 2030
- Exposed to the 1% annual coastal flood event as early as 2030
- Historic coastal flooding at project site

Extreme Precipitation - Urban Flooding

This project received a "High Exposure" because of the following:

- Historic flooding at the project site
- Increased impervious area
- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- Existing impervious area of the project site is between 10% and 50%

Extreme Precipitation - Riverine Flooding

This project received a "Not Exposed" because of the following:

- No historic riverine flooding at project site
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is more than 500ft from a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Increased impervious area
- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No tree removal

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Runway Safety Area & Deck
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would not be expected to result in injuries
- Cost to replace is between $30 million and $100 million
- There are no hazardous materials in the asset

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Runway Safety Area & Deck — Infrastructure

Sea Level Rise/Storm Surge — High Risk

Target Planning Horizon: 2070
Intermediate Planning Horizon: 2050
Return Period: 200-yr (0.5%)

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Projected Tidal Datums: APPLICABLE

Planning Horizon	MHHW	MHW	MTL	MLW	MLLW
	(ft-NAVD88)				
2050	7.7	7.3	2.5	-2.3	-2.6
2070	9.6	9.2	4.3	-0.7	-0.9

Projected Water Surface Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Runway Safety Area & Deck	2050	0.5% (200-Year)	12.6	12.4	12.5
	2070		14.3	14.3	14.3

Projected Wave Action Water Elevation: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(ft - NAVD88)		
Runway Safety Area & Deck	2050	0.5% (200-Year)	16.3	12.5	13.6
	2070		18.4	14.3	15.9

Projected Wave Heights: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average
			(Feet)		
Runway Safety Area & Deck	2050	0.5% (200-Year)	11.0	0.0	7.2
	2070		11.5	0.0	7.2

Projected Duration of Flooding: APPLICABLE
Methodology to Estimate Projected Values

Projected Design Flood Velocity: APPLICABLE
Methodology to Estimate Projected Values

Projected Scour & Erosion: APPLICABLE
Methodology to Estimate Projected Values

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 50-yr (2%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Runway Safety Area & Deck	2070	50-Year (2%)	9.4	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat — High Risk

Target Planning Horizon: 2070
Percentile: 50th Percentile

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

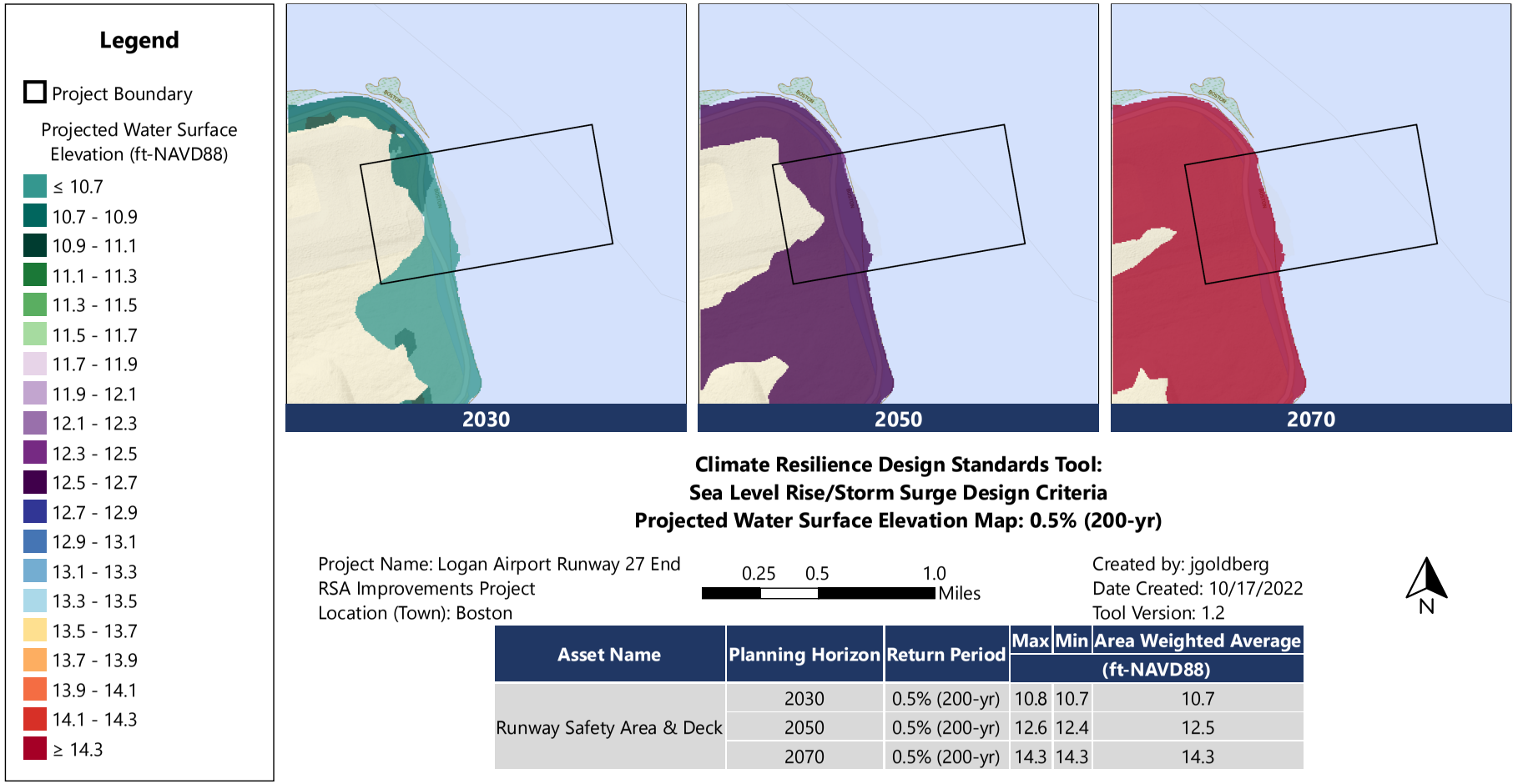
Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Sea Level Rise/Storm Surge Project Maps

The following three maps illustrate the Projected Water Surface Elevation for the 2030, 2050, and 2070 planning horizons corresponding to the lowest return period (largest design storm) recommended across the assets identified for this project in the Tool. For projects that only have Natural Resource assets, the maps will show the Projected Water Surface Elevations corresponding to the 5% (20-year) return period. Refer to the Climate Resilience Design Standards Output - Sea Level Rise/Storm Surge Section for additional values associated with other assets. The maps include the project area as drawn by the user with a 0.1 mile minimum buffer, but do not reflect the location of specific assets on the site.

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values and maps provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, maps, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surge Design Criteria
Projected Water Surface Elevation Map: 0.5% (200-yr)

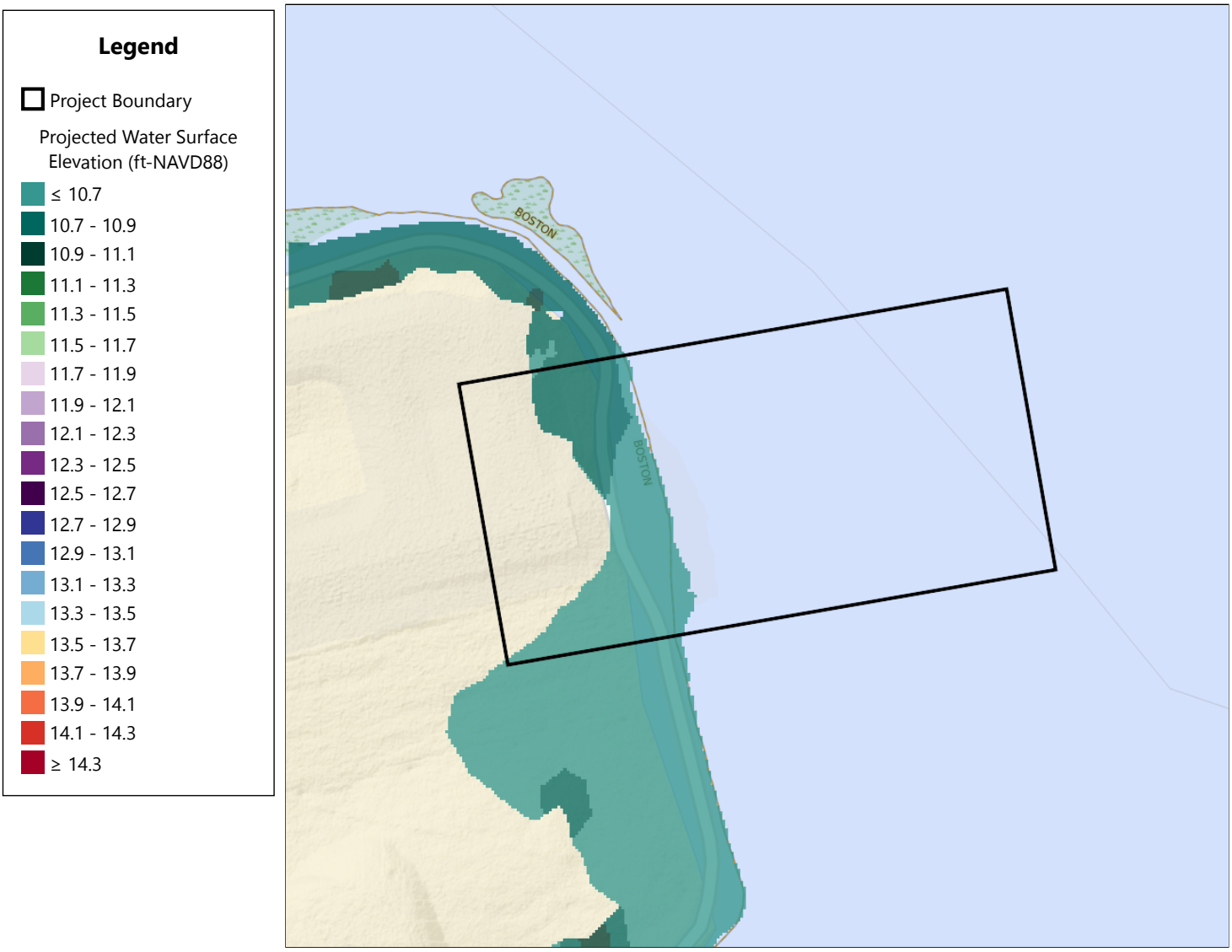
Project Name: Logan Airport Runway 27 End RSA Improvements Project
Location (Town): Boston

0.25 0.5 1.0 Miles

Created by: jgoldberg
Date Created: 10/17/2022
Tool Version: 1.2

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average (ft-NAVD88)
Runway Safety Area & Deck	2030	0.5% (200-yr)	10.8	10.7	10.7
	2050	0.5% (200-yr)	12.6	12.4	12.5
	2070	0.5% (200-yr)	14.3	14.3	14.3



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surve Design Criteria
Projected Water Surface Elevation Map: 2030, 0.5% (200-yr)

Project Name: Logan Airport Runway 27 End RSA Improvements Project
Location (Town): Boston

0.05 0.1 0.25 Miles

Created by: jgoldberg
Date Created: 10/17/2022
Tool Version: 1.2

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average (ft-NAVD88)
Runway Safety Area & Deck	2030	0.5% (200-yr)	10.8	10.7	10.7

Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surve Design Criteria
Projected Water Surface Elevation Map: 2050, 0.5% (200-yr)

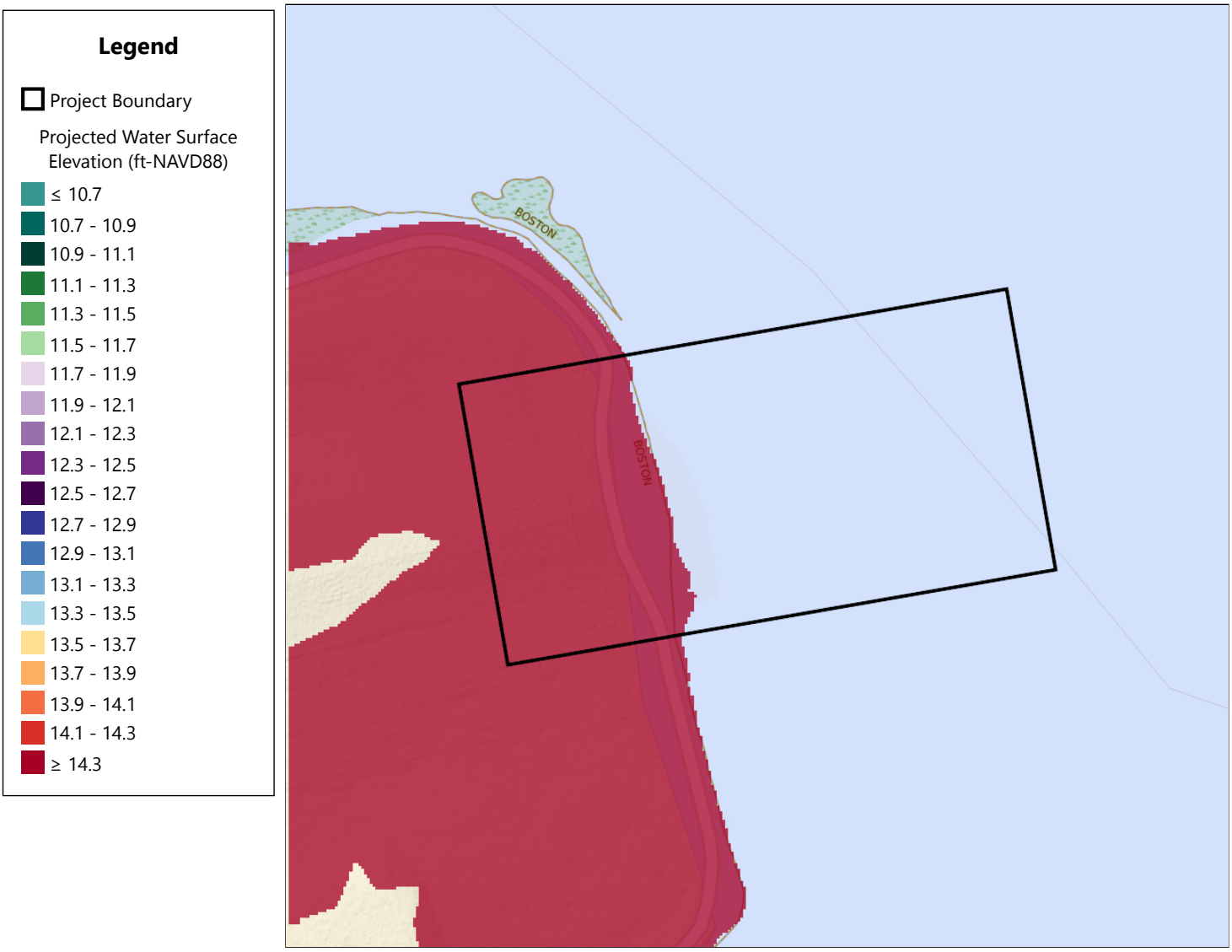
Project Name: Logan Airport Runway 27 End RSA Improvements Project
Location (Town): Boston

0.05 0.1 0.25 Miles

Created by: jgoldberg
Date Created: 10/17/2022
Tool Version: 1.2

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average (ft-NAVD88)
Runway Safety Area & Deck	2050	0.5% (200-yr)	12.6	12.4	12.5



Climate Resilience Design Standards Tool:
Sea Level Rise/Storm Surve Design Criteria
Projected Water Surface Elevation Map: 2070, 0.5% (200-yr)

Project Name: Logan Airport Runway 27 End RSA Improvements Project
Location (Town): Boston

0.05 0.1 0.25 Miles

Created by: jgoldberg
Date Created: 10/17/2022
Tool Version: 1.2

N

Asset Name	Planning Horizon	Return Period	Max	Min	Area Weighted Average (ft-NAVD88)
Runway Safety Area & Deck	2070	0.5% (200-yr)	14.3	14.3	14.3

Project Inputs

Core Project Information

Name:	Logan Airport Runway 27 End RSA Improvements Project
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2100
Location of Project:	Boston
Estimated Capital Cost:	$110,000,000
Who is the Submitting Entity?	Private Other Massachusetts Port Authority (Massport) Stewart Dalzell (sdalzell@massport.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	Massport is proposing to improve the runway safety area (RSA) at the end of Runway 27 at Logan Airport. The improvements are part of a continuing safety program and are required to enhance the RSA, to the extent feasible, to be consistent with the FAA's current airport design standards for RSAs and to enhance rescue access in the event of an emergency. This project is subject to MEPA review and meets a mandatory EIR threshold: 11.03(3)(a)5. Provided that a Chapter 91 License is required, New non-water dependent use or Expansion of an existing non-water dependent structure, provided the use or structure occupies one or more acres of waterways or tidelands; and 11.03(3)(b)1.f. alteration of one half or more acres of any other wetlands.
Project Submission Comments:	

Project Ecosystem Service Benefits

Factors Influencing Output

✓ Project reduces storm damage

Factors to Improve Output

✓ Incorporate nature-based solutions that may provide flood protection
✓ Protect public water supply by reducing the risk of contamination, pollution, and/or runoff of surface and groundwater sources used for human consumption
✓ Incorporate strategies that reduce carbon emissions
✓ Incorporate green infrastructure or nature-based solutions that recharge groundwater
✓ Incorporate green infrastructure to filter stormwater
✓ Incorporate nature-based solutions that improve water quality
✓ Incorporate nature-based solutions that sequester carbon carbon
✓ Increase biodiversity, protect critical habitat for species, manage invasive populations, and/or provide connectivity to other habitats
✓ Preserve, enhance, and/or restore coastal shellfish habitats
✓ Incorporate vegetation that provides pollinator habitat
✓ Identify opportunities to remediate existing sources of pollution
✓ Provide opportunities for passive and/or active recreation through open space
✓ Increase plants, trees, and/or other vegetation to provide oxygen production
✓ Mitigate atmospheric greenhouse gas concentrations and other toxic air pollutants through nature-based solutions
✓ Identify opportunities to prevent pollutants from impacting ecosystems
✓ Incorporate education and/or protect cultural resources as part of your project

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	Yes
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	No
Improves water quality	No
Promotes decarbonization	No
Enables carbon sequestration	No

Provides oxygen production	No
Improves air quality	No
Prevents pollution	No
Remediates existing sources of pollution	No
Protects fisheries, wildlife, and plant habitat	No
Protects land containing shellfish	No
Provides pollinator habitat	No
Provides recreation	No
Provides cultural resources/education	No

Project Climate Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	Yes
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Yes
Does the project site have a history of riverine flooding?	No
Does the project result in a net increase in impervious area of the site?	Yes
Are existing trees being removed as part of the proposed project?	No

Project Assets

Asset: Runway Safety Area & Deck
Asset Type: Transportation
Asset Sub-Type: Other Transportation
Construction Type: Major Repair/Retrofit
Construction Year: 2025
Useful Life: 75

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Infrastructure may be inaccessible/inoperable during natural hazard event, but must be accessible/operable within one day after natural hazard event.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.
Less than 5,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?
No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the infrastructure would not be expected to result in injuries

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?
There are no hazardous materials in the infrastructure

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Minor – Inoperability will not likely affect other facilities, assets, or buildings

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?
Between $30 million and $100 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.
No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?
Loss of infrastructure is not expected to reduce the ability to maintain government services

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?
No Impact

Report Comments

N/A

Appendix E.4- Environmental Justice Supporting Documentation

- Massachusetts Department of Public Health EJ Tool Analysis
- U.S. Environmental Protection Agency EJ Screen Report

This Page Intentionally Left Blank

Massachusetts Department of Public Health EJ Tool Analysis

To understand potential existing vulnerabilities faced by environmental justice (EJ) populations within the Study Area, Vulnerable Health EJ Criteria, as defined by the Massachusetts Department of Public Health (DPH) EJ Tool (DPH EJ Tool),[1] were identified within a 1-mile radius of the Project Site. The Vulnerable Health EJ Criteria are as follows:

- **Heart Attack:** This is evaluated as the 5-year average age-adjusted rate of hospitalizations for heart attacks that is equal to or greater than 110 percent of the state rate. Heart attack data are only gathered from people greater than or equal to 35 years of age, and were based on their residential locations, not where the health incident occurred. This is a criterion because air pollution exposure, including particulate matter, can increase the risk for heart attack and other forms of heart disease. This vulnerable health criteria are shown at the community level in the DPH EJ Tool.
- **Elevated Blood Lead**: This is evaluated as the 5-year average prevalence of elevated childhood blood lead levels that is equal to or greater than 110 percent of the state rate. This is a criterion because lead exposure from sources including soil and drinking water contamination, housing, and household items and toys, disproportionately impacts EJ communities. Low levels of lead exposure to children can cause severe and irreversible health effects. This vulnerable health criteria are shown at the census tract and community level in the DPH EJ Tool.
- **Low Birth Weight**: This is evaluated as the 5-year average low birth weight rate among full-term births that is equal to or greater than 110 percent of the state rate. A baby is considered low birth weight if they are less than 5.5 pounds, and data only consider singleton births. This is a criterion because there is an increased risk of delivering a low-birth-weight baby or a baby having other birth defects when exposed to air and environmental contaminants. Additionally, women of color and women of low income are at a higher risk. This vulnerable health criterion is shown at the census tract and community level in the DPH EJ Tool.
- **Childhood Asthma**: This is defined as the 5-year average rate of emergency department visits for childhood asthma that is equal to or greater than 110 percent of the state rate. This is a criterion because EJ populations experience a greater risk of asthma due to an increased exposure to asthma triggers, including air pollution, which impacts one's overall health and wellbeing. EJ communities also have more limited access to health care services, which is considered a contributing factor. This vulnerable health criteria are shown at the community level in the DPH EJ Tool.

Tables E.4-1 and **E.4-2** provide a summary of the census tracts within the 1-mile radius that have Elevated Blood Lead Prevalence and Low Birth Weight Rate per 1,000, respectively. Census tracts that include EJ block groups identified in **Table 3.13-1** of Chapter 3, *Affected Environment and Environmental Consequences* are noted within these tables. The EJ block groups within the 1-mile of the Project Site are

1 Commonwealth of Massachusetts. 2021. MA DPH Environmental Justice Tool. https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html.

not within census tracts that have rates of Elevated Blood Lead Prevalence and Low Birth Weight Rate per 1,000 that are significantly higher.

The Heart Attack and Childhood Asthma criteria are only shown at the community level. **Tables E.4-3** and E.4-4 present these vulnerabilities, as well as Elevated Blood Lead Prevalence and Low Birth Weight Rate per 1,000 at the community level, for the City of Boston and the Town of Winthrop, respectively, using a 1-mile radius from the Project Site. No vulnerable health criteria at the community level in the Town of Winthrop were identified as significantly higher. Elevated Blood Lead Prevalence, Low Birth Weight, and Childhood Asthma were identified as significantly higher at the community level in the City of Boston; however, these findings do not directly correlate to the census tracts that include EJ block groups because this data is presented at the community level.

All data counts identified in the DPH EJ tool were included in the tables for transparency. The following bullets provide additional explanation from the DPH EJ Tool about the data presented in these tables:

- **Statistical Significance and Confidence Intervals:** With a 95 percent confidence interval, there is a possibility that those identified as "not statistically different" or "statistically significantly lower" are actually not due to chance, and that those "statistically significantly higher" are actually due to chance. The Massachusetts Environmental Public Health Tracking (MA EPHT) defines statistical significance as the likelihood that the difference found between groups was not due to chance alone. Statistical significance can be based on the use of statistical tests and comparison of confidence intervals. Overlapping confidence intervals indicate that any difference in the screening or prevalence observed may be due to chance. Confidence intervals that do not overlap are considered statistically significant and indicate a small likelihood that the difference is due to chance.[2]
- **Stability:** Stability refers to the reliability of the rate; when there are too few cases, the rate is unstable or considered unreliable.[3]

Table E.4-1 Elevated Blood Lead Prevalence by Census Tract

Census Tract	Community	Statistical Significance	Stability	Case Count	Rate per 1,000	Confidence Intervals	Statewide Rate Per 1,000	110% Statewide Rate per 1,000	>110% Statewide Rate? [2]
1804 [1]	Winthrop	Not statistically different	Unstable	2	33.7	11.7-55.7	14.985	16.484	Yes
1805	Winthrop	Not statistically different	Unstable	2	22.1	8.4-35.8	14.985	16.484	Yes
9801.01 [1]	Boston	Not statistically different	Unstable	0	0	0-6,394.8	14.985	16.484	No
9901.01 [1]	Winthrop	Statistically significantly lower	Unstable	0	0	0-0	14.985	16.484	No

2 Commonwealth of Massachusetts. 2021. Massachusetts Environmental Public Health Tracking, MA EPHT All Inclusive glossary. https://matracking.ehs.state.ma.us/Glossary/index.html.
3 Commonwealth of Massachusetts. 2021. MA DPH Environmental Justice Tool. https://dphanalytics.hhs.mass.gov/ibmcognos/.

Census Tract	Community	Statistical Significance	Stability	Case Count	Rate per 1,000	Confidence Intervals	Statewide Rate Per 1,000	110% Statewide Rate per 1,000	>110% Statewide Rate? [2]
Elevated Blood Lead Prevalence Not Shown									
9813 [1]	Boston	Not Shown	Not Shown	Not Shown	Not Shown	Not Shown	14.985	16.484	N/A

Source: DPH EJ Tool, 2022.
Notes: Year Range 2016-2020.
All census tracts in this table are also classified as "Low Birth Weight Rate per 1,000" in **Table E.4-2**.
For determining prevalence, children can be counted only once per year, but can appear in multiple years. Prevalence is the number of tests in a given blood lead level category out of all the children screened in that year within specific age ranges, per 1,000 children."
1 EJ block group present within.[4]
2 The determination of greater than 110 percent statewide rate was made by comparing the rate per 1,000 to the 110 percent statewide rate per 1,000.

Table E.4-2 Low Birth Weight Rate per 1,000 by Census Tract

Census Tract	Community	Statistical Significance	Stability	Case Count	Rate per 1,000	Confidence Intervals	Statewide Rate Per 1,000	110% Statewide Rate per 1,000	>110% Statewide Rate? [2]
1803.01	Winthrop	Not statistically significantly different	Unstable	0	0	0-546.6	216.8	238.5	No
1804 [1]	Winthrop	Not statistically significantly different	Unstable	0	0	0-735	216.8	238.5	No
1805	Winthrop	Not statistically different	Unstable	1	271.7	33.5-509.9	216.8	238.5	Yes
9801.01 [1]	Boston	Statistically significantly lower	Unstable	0	0	0-0	216.8	238.5	No
9813 [1]	Boston	Not statistically significantly different	Unstable	0	0	0-1,776.4	216.8	238.5	No
9901.01 [1]	Winthrop	Statistically significantly lower	Unstable	0	0	0-0	216.8	238.5	No

Source: DPH EJ Tool, 2022.
Notes: Year Range 2011-2015.
All census tracts in this table are also classified as "Elevated Blood Lead Prevalence" in **Table E.4-1**.
1 EJ block group present within.
2 The determination of greater than 110 percent statewide rate was made by comparing the rate per 1,000 to the 110 percent statewide rate per 1,000.

4 Commonwealth of Massachusetts. 2021. Massachusetts Environmental Public Health Tracking, Childhood Lead Poisoning. https://matracking.ehs.state.ma.us/Health-Data/Childhood_Blood_Lead_Levels.html.

Table E.4-3 Vulnerabilities by Community (Boston)

Year Range	Health Topic	Statistical Significance	Stability	Case Count	Rate per 1,000	Confidence Intervals	Statewide Rate per 1,000	110% Statewide Rate per 1,000	>110% Statewide Rate?[2]
2016 - 2020	Elevated Blood Lead Prevalence [1]	Statistically significantly higher	Stable	257	16.2	15.3-17.1	14.985	16.484	No
2011 - 2015	Low Birth Weight	Statistically significantly higher	Stable	197	282.4	264.8-300.1	216.8	238.5	Yes

Year Range	Health Topic	Statistical Significance	Stability	Case Count	Rate per 10,000 Label	Confidence Intervals	Statewide Rate per 10,000	110% Statewide Rate per 10,000	>110% Statewide Rate?[2]
2013 - 2017	Heart Attack	Statistically significantly lower	Stable	719	23.8	23-24.5	26.423	29.065	No
2013 - 2017	Pediatric Asthma Emergency Department Visits	Statistically significantly higher	Stable	1,059	172.8	168.2-177.5	83.1	91.4	Yes

Source: DPH EJ Tool, 2022.
1 Rate Type: BLL Rate per 1,000.
2 The determination of greater than 110 percent statewide rate was made by comparing the rate per 1,000 or 10,000 to the 110 percent statewide rate per 1,000 or 10,000.

Table E.4-4 Vulnerabilities by Community (Winthrop)

Year Range	Health Topic	Statistical Significance	Stability	Case Count	Rate per 1,000	Confidence Intervals	Statewide Rate per 1,000	110% Statewide Rate per 1,000	>110% Statewide Rate?[2]
2016 - 2020	Elevated Blood Lead Prevalence[1]	Not statistically different	Stable	8	18.5	12.9-24	14.985	16.484	Yes
2011 - 2015	Low Birth Weight	Not statistically significantly different	Unstable	3	171.5	78.3-264.7	216.8	238.5	No

Year Range	Health Topic	Statistical Significance	Stability	Case Count	Rate per 10,000 Label	Confidence Intervals	Statewide Rate per 10,000	110% Statewide Rate per 10,000	>110% Statewide Rate?[2]
2013 - 2017	Heart Attack	Statistically significantly lower	Stable	30	21.2	17.8-24.6	26.423	29.065	No
2013 - 2017	Pediatric Asthma Emergency Department Visits	Statistically significantly higher	Unstable	8	45.4	31.2-59.7	83.1	91.4	No

Source: DPH EJ Tool, 2022.
1 Rate Type: BLL Rate per 1,000.
2 The determination of greater than 110 percent statewide rate was made by comparing the rate per 1,000 or 10,000 to the 110 percent statewide rate per 1,000 or 10,000.

Table E.4-5 Sources of Pollution Within 1 Mile

DPH Source	Number of Sources within 1 Mile
MassDEP Major Air and Waste Facilities	
Air Operating Permits	0
Hazardous Waste Treatment, storage/disposal	0
Hazardous Waste Recycler	0
Large Quantity Generators	0
Large Quantity Toxic Users	0
MassDEP Tier Classified 21E Sites[1]	0
MassDEP Tier II Facilities	0
MassDEP Sites with Activity and Use Limitations (AUL)	0
Underground Storage Tanks	1 (Pico Avenue Sewage Pumping Station)
USEPA Facilities	
Toxic Release Inventory sites 2017	0
Superfund Site Boundaries	0

Source: DPH EJ Tool, 2022.
MassDEP Massachusetts Department of Environmental Protection
EPA U.S. Environmental Protection Agency
1 The approximate location of oil and/or hazardous material disposal sites that have been Tier Classified under M.G.L. Chapter 21E and the Massachusetts Contingency Plan (MCP).

EJScreen Report (Version 2.1)

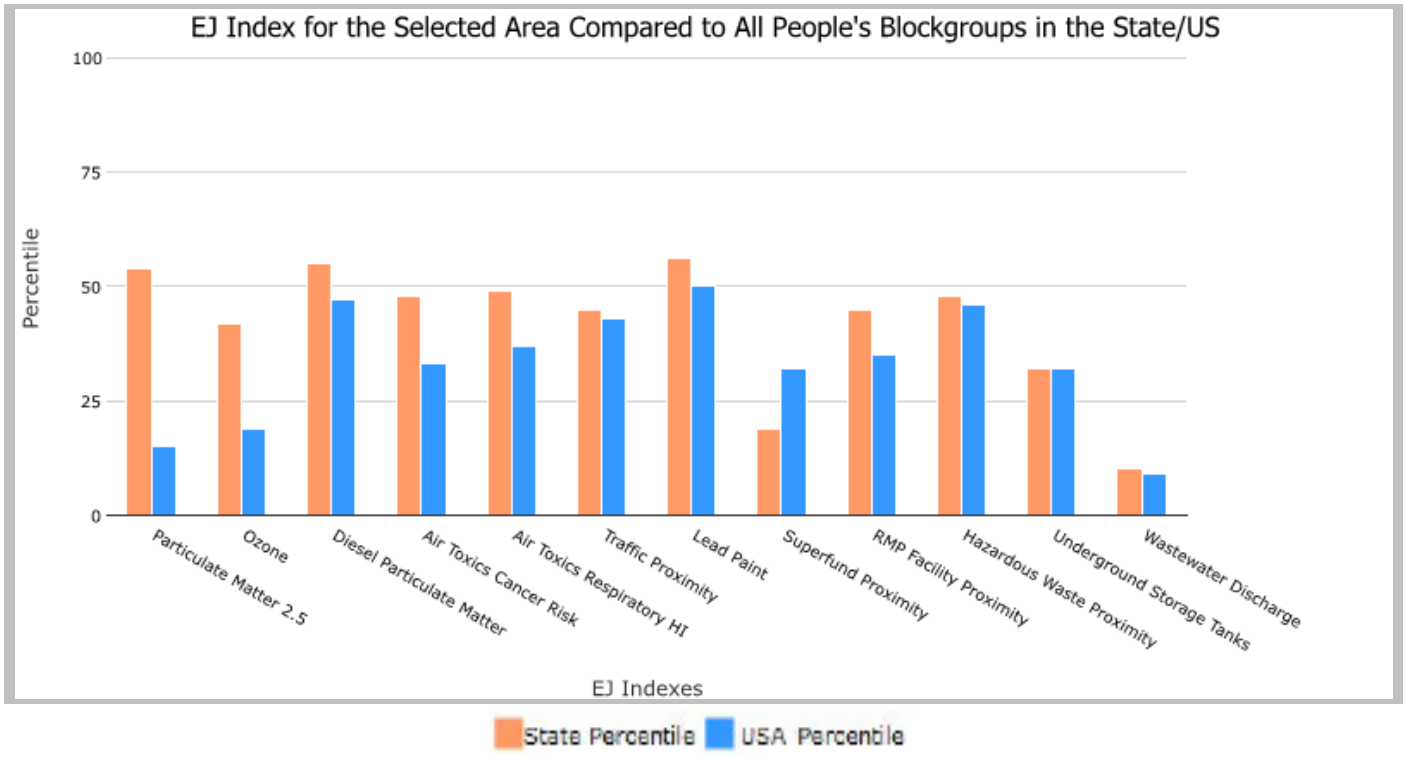
1 mile Ring around the Area, MASSACHUSETTS, EPA Region 1

Approximate Population: 6,527

Input Area (sq. miles): 3.78

Runway 27 End RSA Improvements Project (The study area contains 1 blockgroup(s) with zero population

Selected Variables	State Percentile	USA Percentile
Environmental Justice Indexes		
EJ Index for Particulate Matter 2.5	54	15
EJ Index for Ozone	42	19
EJ Index for Diesel Particulate Matter*	55	47
EJ Index for Air Toxics Cancer Risk*	48	33
EJ Index for Air Toxics Respiratory HI*	49	37
EJ Index for Traffic Proximity	45	43
EJ Index for Lead Paint	56	50
EJ Index for Superfund Proximity	19	32
EJ Index for RMP Facility Proximity	45	35
EJ Index for Hazardous Waste Proximity	48	46
EJ Index for Underground Storage Tanks	32	32
EJ Index for Wastewater Discharge	10	9



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

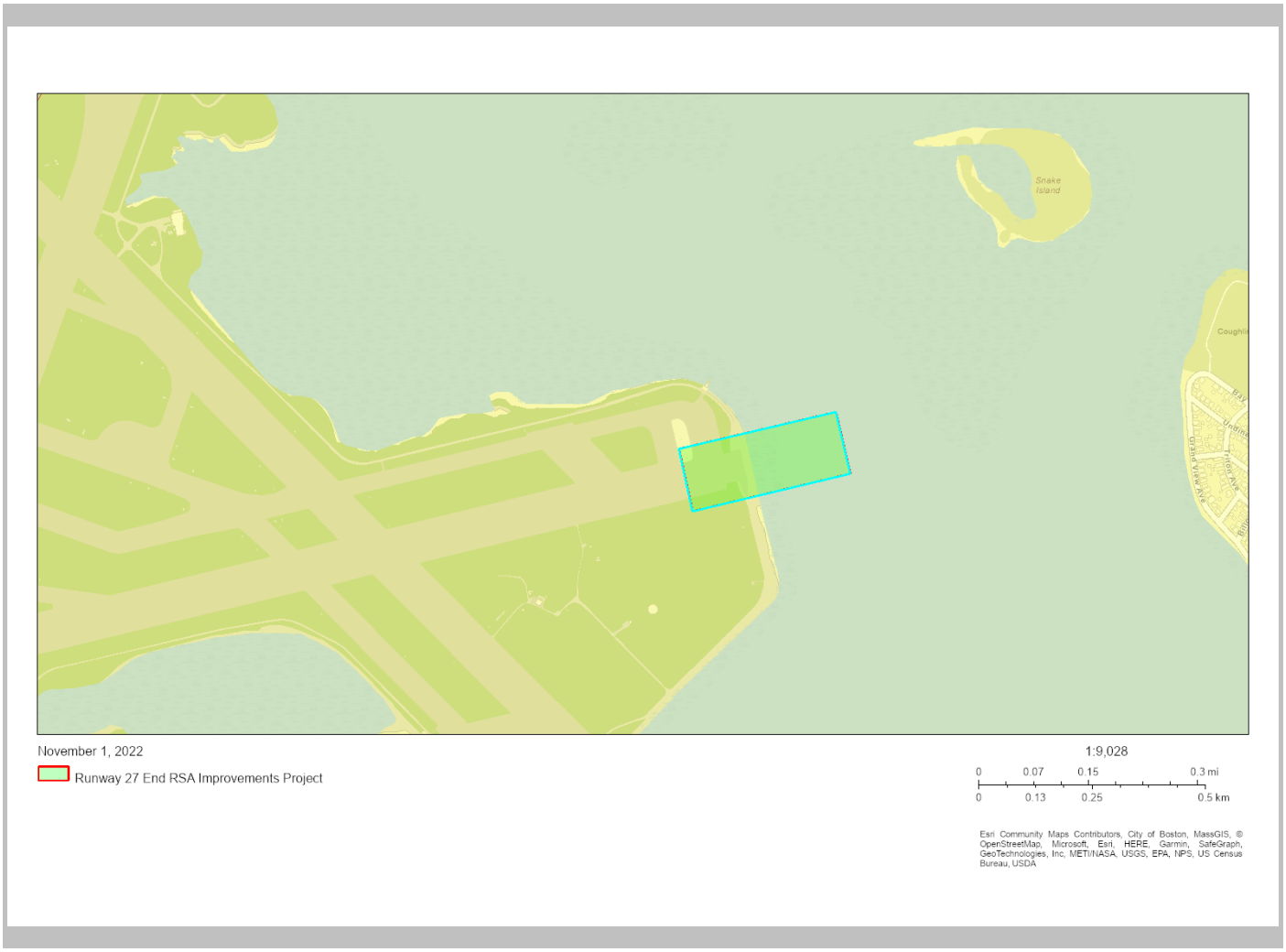
EJScreen Report (Version 2.1)

1 mile Ring around the Area, MASSACHUSETTS, EPA Region 1

Approximate Population: 6,527

Input Area (sq. miles): 3.78

Runway 27 End RSA Improvements Project (The study area contains 1 blockgroup(s) with zero population



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJScreen Report (Version 2.1)

1 mile Ring around the Area, MASSACHUSETTS, EPA Region 1

Approximate Population: 6,527

Input Area (sq. miles): 3.78

Runway 27 End RSA Improvements Project (The study area contains 1 blockgroup(s) with zero population

Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
Pollution and Sources					
Particulate Matter 2.5 (µg/m^3)	7.39	6.79	75	8.67	19
Ozone (ppb)	39.3	39.5	49	42.5	28
Diesel Particulate Matter* (µg/m^3)	0.463	0.307	82	0.294	80-90th
Air Toxics Cancer Risk* (lifetime risk per million)	34	24	99	28	80-90th
Air Toxics Respiratory HI*	0.55	0.3	99	0.36	95-100th
Traffic Proximity (daily traffic count/distance to road)	1500	2400	66	760	88
Lead Paint (% Pre-1960 Housing)	0.84	0.49	86	0.27	93
Superfund Proximity (site count/km distance)	0.057	0.18	18	0.13	48
RMP Facility Proximity (facility count/km distance)	0.48	0.74	58	0.77	58
Hazardous Waste Proximity (facility count/km distance)	5.1	5.6	72	2.2	88
Underground Storage Tanks (count/km^2)	0.84	3.4	32	3.9	45
Wastewater Discharge (toxicity-weighted concentration/m distance)	3.2E-06	0.21	9	12	13
Socioeconomic Indicators					
Demographic Index	13%	26%	32	35%	17
People of Color	16%	29%	40	40%	33
Low Income	10%	22%	32	30%	18
Unemployment Rate	5%	5%	59	5%	56
Limited English Speaking Households	2%	6%	55	5%	65
Less Than High School Education	3%	9%	36	12%	26
Under Age 5	4%	5%	46	6%	40
Over Age 64	21%	17%	71	16%	72

*Diesel particular matter, air toxics cancer risk, and air toxics respiratory hazard index are 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. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

For additional information, see: www.epa.gov/environmentaljustice

Appendix E.5- Updated Environmental Justice Outreach Plan

This Page Intentionally Left Blank

Updated Environmental Justice Outreach Plan

Introduction and Regulatory Overview

The U.S. Environmental Protection Agency (USEPA) defines environmental justice (EJ) as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies."[1] The Massachusetts Port Authority (Massport) is committed to prioritizing inclusive public outreach efforts that engage EJ populations and disadvantaged communities. This document outlines Massport's EJ Outreach Plan for the proposed Runway 27 End Runway Safety Area (RSA) Improvements Project (the Project or the Proposed Project) at Boston Logan International Airport (Logan Airport or the Airport). Massport recognizes the importance of a robust outreach approach to ensure the public is aware of the Proposed Project and so that those interested have an opportunity to review and comment.

The Proposed Project is subject to the requirements of the Massachusetts Environmental Policy Act (MEPA) and the National Environmental Policy Act (NEPA). Per the *Transition Rules for Public Involvement Requirements for Environmental Justice Populations*, which was released during the development of the MEPA Environmental Notification Form (ENF) for this Project, all ENFs filed with the MEPA Office are required to identify the location of a project relative to EJ populations, as depicted on the Executive Office of Energy and Environmental Affairs (EEA) Environmental Justices Maps Viewer (EJ Maps Viewer).[2] Massport consulted with the MEPA Office prior to filing the ENF, during preparation of the Draft Environmental Impact Report (DEIR), and also during preparation of this combined Draft Environmental Assessment and Final Environmental Impact Report document (Draft EA/Final EIR).

The primary policy governing EJ is Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*,[3] which directs federal agencies to "identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law."[4] The FAA's 1050.1F Desk Reference establishes that Executive Order 12898, the accompanying Presidential Memorandum, and U.S. Department of Transportation Order 5610.2a, *Final Order to Address Environmental Justice in Low-Income and Minority Populations*, require the FAA to meaningfully involve

1 U.S. Environmental Protection Agency, "Learn About Environmental Justice," September 22, 2021, www.epa.gov/environmentaljustice/.
2 These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.
3 The White House, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, February 11, 1994.
4 U.S. Environmental Protection Agency, "Summary of Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," September 28, 2021, https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice.

populations identified as minority and low-income per Census Bureau data from the American Community Survey (ACS) 2019 Five-Year Estimates (2015-2019). Projects filing an EA must include an analysis of effects on minority populations and low-income populations to determine whether Project activities would result in a disproportionately adverse effect.

The FAA has not established a significance threshold for EJ criteria. The FAA does, however, establish the consideration of significant Project and cumulative impacts on EJ populations, where impacts and/or Project benefits are not equally distributed to or experienced by EJ populations in respect to non-EJ populations. When determining whether human health and environmental effects are disproportionately high and adverse, agencies are to consider, to the extent practicable, whether the effects are significant under NEPA or above generally accepted norms. The EEA provides more stringent EJ criteria thresholds and definitions than Executive Order 12898 and other regulations referenced in FAA Order 1050.1F, and also includes a linguistic isolation metric as an EJ criterion. As this Project must comply with both NEPA and MEPA, the Massachusetts EJ Policy's EJ criteria definitions and study area requirements have been utilized to provide a more conservative approach. Coordination with FAA and EEA will extend into final design and construction.

Project Description

As described in more detail in DEIR Chapter 1, *Project Description and Permitting*,[5] Massport proposes to improve the RSA at the end of Runway 27 at Logan Airport. An RSA is a safety area surrounding a runway to reduce the risk of damage to aircraft and increase protection of passengers in the event of an unintentional "excursion" from the runway. An "excursion" from the runway can include an overrun (an arriving aircraft fails to stop before the end of the runway), an undershoot (an aircraft arriving on a runway touches down before the start of the paved runway surface), or a veer-off to one side of a runway. The Proposed Project is part of a continuing Federal Aviation Administration (FAA) safety program required to improve the RSAs, to the extent feasible, to be compliant with FAA's airport design standards and to enhance rescue access in the event of an emergency. **This Project is a required FAA safety project that would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway**.

The RSA at the eastern end of Runway 9-27 does not meet FAA design standards for length, as this runway was constructed before the existing FAA RSA design standards were in place. RSAs are typically level areas 1,000 feet long by 500 feet wide that surround the runway. RSAs may be shorter in length if an Engineered Materials Arresting System (EMAS) is installed at the runway end to provide an equivalent level of safety. An EMAS is a safety system constructed of collapsible concrete blocks. When, under an emergency, an aircraft rolls into an EMAS, the tires of the aircraft collapse the lightweight concrete, and the aircraft is slowed down in a way that minimizes damage to the aircraft.

In the *Boston Logan Airport Runway Incursion Mitigation Study/Runway 9-27 Runway Safety Area (RSA) Alternatives Study* (the RIM Study; see Appendix B),[6] the FAA identified that the preferred RSA improvement option is to construct a 650-foot-long RSA with an EMAS on a pile-supported deck (approximately 450 feet long by 306 feet wide). Massport previously constructed a similar RSA deck in

5 Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston, Massachusetts, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

6 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B: RSA Determination Form, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

2011/2012 at the eastern end of Runway 15R-33L (the Runway 33L End). The proposed Runway 27 End RSA deck would not include an approach light pier extending beyond the RSA deck such as that which exists at the Runway 33L End.

Background and Coordination

In collaboration with the MEPA Office, Massport developed a community outreach and public engagement plan (EJ Outreach Plan) focused on EJ communities near the proposed Runway 27 End RSA Improvements Project. The plan was prepared and is being implemented in accordance with the *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs* (2021 EJ Policy). Effective June 24, 2021, the 2021 EJ Policy defines EJ principles and populations, as well as environmental benefits and burdens, included in Chapter 8 of the Commonwealth of Massachusetts Acts of 2021, *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (signed on March 26, 2021). [7] Although the Project ENF was filed prior to issuance of the final protocols, Massport continues to voluntarily comply with the 2021 EJ Policy and is working with the MEPA Office to incorporate comprehensive outreach and analysis of EJ populations within the Study Area.

An EJ population is a neighborhood (defined as a census block group) that includes one or more of the following demographic characteristics:

- **Income:** The annual median household income is not more than 65 percent of the statewide annual median household income;
- **Minority:** Minorities (i.e., individuals who identify themselves as Latino/Hispanic, Black/African American, Asian, Indigenous people, and people who otherwise identify as non-white) comprise 40 percent or more of the population;
- **English Language Isolation:** 25 percent or more households lack English language proficiency; or
- **Minority and Income:** Minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

The Secretary of the EEA can also designate a geographic portion of a neighborhood as an EJ population.

Figure E.5-1 displays EJ populations within a 1-mile radius of the Project Site. Based on 2020 U.S. Census data provided by the EEA EJ Maps Viewer[8] and the definitions above, there are four EJ block groups within 1 mile of the Project Site. Three are in the City of Boston and one is in the Town of Winthrop. Although only portions of the EJ block groups fall within the 1-mile radius, the entire EJ block group is included in EJ outreach efforts. The only residences within 1 mile of the Project Site are within the Winthrop block group.

7 Massachusetts Governor Baker signed *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy* (the Climate Roadmap Act) on March 26, 2021, Session Law 2021, c. 8, ss. 57-60, which defined EJ principles and populations, and environmental benefits and burdens. The *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs* (2021 EJ Policy), originally issued in 2002 and updated on June 24, 2021, incorporates the definitions from the *Climate Roadmap Act* and reinforces an inclusive community involvement in the environmental decision-making process. The 2021 EJ Policy also builds upon federal guidelines under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.*

8 Executive Office of Energy and Environmental Affairs, EJ Maps Viewer: https://mass-eoeea.maps.arcgis.com/apps/MapSeries/index.html?appid=535e4419dc0545be980545a0eeaf9b53.

Figure E.5-1: Environmental Justice Populations **Runway 27 End RSA Improvements Project**

Proposed Project Site
1 Mile Site Radius
Airport Boundary
Languages spoken by at least 5% of the census tract who do not speak English Very Well
Minority *
Income
Minority and Income
Minority and English Isolation

0 1250 2500 5000 Feet

Sources: Nearmap Imagery March 2021, MassGIS: Environmental Justice Population in 2020; EEAGIS

*Although Block Group 2 Census Tract 180400 is classified as Minority, it meets the Climate Roadmap Act definition of Minority and Income.

The 1-mile radius includes area within the East Boston and Harbor Islands communities, and the Town of Winthrop. The EJ block groups that have an area within 1 mile of the Project Site meet the minority EJ criterion, and do not meet the Income or English Language Isolation criteria. Block Group (BG) 1, Census Tract (CT) 9801.01 has a total minority population of 62 percent, while BG 2, CT 9813 and BG 2, CT 1804 have a total minority population of 41 percent and 26 percent[9] respectively. The only EJ block group that contains residential land uses is BG 2, CT 1804 in Winthrop.

Summary of Communities

The EJ block group in East Boston within 1 mile of the Project Site (BG 2, CT 9813) consists entirely of the Logan Airport campus and East Boston Memorial Park, both of which abut residential areas not included within the EJ block group. The entire East Boston community has an ACS demographic profile[10] of 3.3 percent Black or African American of the total population and 50.4 percent Hispanic or Latino of the total population. The EJ block group in the Harbor Islands community within 1 mile of the Project Site (BG 1, CT 9801.01) is located on Deer Island and consists of the Deer Island Wastewater Treatment Plant campus; the EJ block group does not contain residential area, although it abuts a residential area of Winthrop. While the Harbor Islands are their own Boston community, there are no community-specific ACS11 demographic data available for them. The EJ block group in Winthrop within 1 mile of the Project Site (BG 2, CT 1804) is a residential area, and includes the area bound north by River Road and south by Washington Avenue. The entire Town of Winthrop has an ACS demographic profile[12] of 4.3 percent Black or African American of the total population and 11.7 percent Hispanic or Latino of the total population. There is an additional EJ block group identified by the EJ Maps Viewer (BG 0, CT 9901.01), but it wholly consists of water resources and is not included in the EJ Outreach Plan.

Summary of Languages Spoken

The 2021 EJ Policy states that all identified census tracts with languages spoken by 5 percent or more of residents who identify as not speaking English "very well," in addition to any languages identified from the English Language Isolation EJ criterion, must be incorporated into public involvement efforts. While none of the block groups within 1 mile of the Project Site were identified as having English Language Isolation in the 2020 ACS Census data, two of these EJ block groups are within census tracts that are identified by the ACS and the EEA as having "Languages spoken by at least 5 percent of population in the census tract who do not speak English very well." Therefore, these census tracts have a population of more than 5 percent that are linguistically isolated, but less than 25 percent of households within the EJ block groups that are linguistically isolated. The populations that meet these criteria include 6.4 percent Spanish or Spanish Creole-speakers in Census Tract 9801.01 and 20.2 percent Spanish or Spanish Creole-speakers in Census Tract 9813.

Effective communication with stakeholders, including Massport and the City of Boston, among others, will be required to adequately consider and address needs, concerns, and interests of Logan Airport's constituency of passengers and users, and EJ communities within a 1-mile radius of the Project Site that may be impacted by the Proposed Project.

9 Although Block Group 2, Census Tract 180400 is classified as meeting the EJ Minority criterion, it meets the Climate Roadmap Act definition of Minority and Income. The Minority designation is used in the EJ Outreach Plan for consistency with the EJ criteria data in the EJ Maps Viewer.
10 These data were obtained from https://data.boston.gov/dataset/2020-census-for-boston.
11 These data were obtained from https://data.boston.gov/dataset/2020-census-for-boston.
12 These data were obtained from https://www.census.gov/quickfacts/winthroptowncitymassachusetts.

Stakeholders

A stakeholder list of individuals and groups associated with this Project and EJ communities has been developed for public engagement purposes. The list includes state and city officials, organizations, and community groups. Massport has a longstanding relationship with the City of Boston and works to engage the City of Boston and its residents in changes to Logan Airport and community needs. Boston and Winthrop elected officials and community organizations, groups, and committees are listed in the **Tables E.5-1** and **E.5-2** below.[13] Federal, state, city, and community stakeholders have been and will continue to be engaged throughout the Project development process and will be kept apprised of relevant Project permitting steps, details, and impacts. Additional community stakeholders may be added to outreach efforts as the Project progresses.

Table E.5-1 Primary Federal, State, and City Officials

Elected Official Name	Title	Phone	Email
Ed Markey	U.S. Senator for Massachusetts	(617) 565-8519	By mail*
Elizabeth Warren	U.S. Senator for Massachusetts	(617) 565-3170	By mail*
Katherine Clark	U.S. Representative for Massachusetts - 5th District	(617) 354-0292	By mail*
Ayanna Pressley	U.S. Representative for Massachusetts - 7th District	(617) 850-0040	By mail*
Stephen F. Lynch	U.S. Representative for Massachusetts - 8th District	(617) 428-2000	By mail*
Michelle Wu	Mayor of Boston	(617) 635-4500	michelle.wu@boston.gov
Adrian Madaro	State Representative - 1st Suffolk	(617) 722-2060	Adrian.Madaro@mahouse.gov
Lydia Edwards	State Senator - 1st Suffolk and Middlesex	(617) 722-1634	Lydia.Edwards@masenate.gov
Gabriela Coletta	Boston City Council, District 1	(617) 635-3200	gabriela.coletta@boston.gov
Nathalia Benitez	East Boston Community Liaison	(617) 635-2681	nathalia.benitezperez@boston.gov
Michael Flaherty	City Councilor, At-Large	(617) 635-4205	michael.flaherty@boston.gov
Ruthzee Louijeune	City Councilor, At-Large	(617) 635-4376	ruthzee.louijeune@boston.gov
Julia Mejia	City Councilor, At-Large	(617) 635-4217	julia.mejia@boston.gov
Erin Murphy	City Councilor, At-Large	(617) 635-3115	erin.murphy@boston.gov
Anthony Marino	Winthrop Town Manager	(617) 846-1705	amarino@town.winthrop.ma.us
Michel Denis	Haitian Community Liaison	(617) 635-2677	michel.denis@boston.gov
Denise Dos Santos	Cape Verdean Community Liaison	(617) 635-1880	denise.dossantos@boston.gov
Kevin Tran	Vietnamese Community Liaison	(617) 635-4873	kevin.tran@boston.gov
Uju Onochie	African Community Liaison	(617) 635-3307	chinonye.onochie@boston.gov

* U.S. Senators and Representatives are communicated with via phone or printed mail. Addresses utilized for printed mail can be found in Chapter 5, *Distribution List*.

13 Includes organizations provided in the EJ Reference List provided by MEPA on May 9, 2022.

Table E.5-2 Primary Community Groups

Organization	Contact Name	Contact Information	Additional Information
Air, Inc.*	Chris Marchi, Vice President	cbmarchi@gmail.com	https://airportimpactreliefinc.org/
Appalachian Mountain Club*	Heather Clish, Director of Conservation and Recreation Policy	hclish@outdoors.org	https://www.outdoors.org/
Asian Community Development Corporation*	May Lui, Community Outreach Coordinator	may.lui@asiancdc.org	https://asiancdc.org/
Association of Latino Professionals for America (ALPFA) – Boston Chapter	Luz Arregoces, Director of Community Affairs	luz.arregoces@boston.alpfa.org	https://www.alpfa.org/page/boston Part of Greater Boston Latino Network (GBLN); Represents Latino students and professionals
BCYF PARIS STREET	Boston Centers for Youth and Families	(617) 635-4920 BCYF@boston.gov	Community center that offers a wide range of diverse features and programs
BCYF PINO			
Boston Farms Community Land Trust*	Joy Gary, Executive Director	joy@bostonfarms.org	https://www.bostonfarms.org/
Boston Harbor Now*	Alice Brown, Chief of Planning and Policy	abrown@bostonharbornow.org	https://www.bostonharbornow.org/
	Kathy Abbott, President and CEO	kabbott@bostonharbornow.org	
Browning the GreenSpace*	Kerry Bowie, Board President	kerry@msaadapartners.com	http://browningthegreenspace.org/
Chappaquiddick Tribe of the Wampanoag Nation*	Alma Gordon, President	tribalcouncil@chappaquiddick-wampanoag.org	https://chappaquiddickwampanoag.org/
Chappaquiddick Tribe of the Wampanoag Nation, Whale Clan*	Patricia D. Rocker, Council Chair	rockerpatriciad@verizon.net	
Charles River Conservancy*	Laura Jasinski, Executive Director	ljasinski@thecharles.org	https://thecharles.org/
Charles River Watershed Association*	Heather Miller	hmiller@cwra.org	https://www.crwa.org/

Table E.5-2 Primary Community Groups

Organization	Contact Name	Contact Information	Additional Information
Chaubunagungamaug Nipmuck Indian Council*	Kenneth White, Council Chairman	acw1213@verizon.net	https://www.nipmuck.org/
Chinatown Community Land Trust*	Lydia Lowe, Executive Director	lydia@chinatownclt.org	https://chinatownclt.org/
Chinatown Residence Association*	Hing Sang	chinatownresidents@gmail.com	https://chinatownresidents.wordpress.com/
Chinese Progressive Association*	Karen Chen, Executive Director	karen@cpaboston.org	https://cpaboston.org/
City Life/Vida Urbana	Frances Amador, Lead Organizer for East Boston	(617) 397-3773 famador@clvu.org	https://www.clvu.org/ Community organization for racial, social, and economic justice empowerment.
Clean Water Action*	Cindy Luppi, New England Director	cluppi@cleanwater.org	https://www.cleanwateraction.org/
Coalition for Social Justice*	Deb Fastino, Executive Director	dfastino@aol.com	https://coalitionforsocialjustice.org/
Community Action Works*	Sylvia Broude, Executive Director	sylvia@communityactionworks.org	https://communityactionworks.org/
Conservation Law Foundation*	Staci Rubin, Senior Attorney	srubin@clf.org	https://www.clf.org/
E4TheFuture*	Pat Stanton, Project Manager	pstanton@e4thefuture.org	https://e4thefuture.org/
Environment Massachusetts*	Ben Hellerstein, MA State Director	ben@environmentmassachusetts.org	https://environmentmassachusetts.org/
Environmental League of MA*	Nancy Goodman, Vice President for Policy	ngoodman@environmentalleague.org	https://www.environmentalleague.org/
GreenRoots, Inc.	Maria Belen Power, Associate Executive Director	mariabelenp@greenrootschelsea.org	https://www.greenrootschelsea.org/
	Eugene Benson, Former City Planning and Urban Affairs Professor	eugene.benson@gmail.com	
Healthcare without Harm*	Winston Vaughan, Director of Climate Solutions	wvaughan@hcwh.org	https://noharm.org/

Table E.5-2 Primary Community Groups

Organization	Contact Name	Contact Information	Additional Information
Herring Pond Wampanoag Tribe*	Melissa Ferretti, Chair	melissa@herringpondtribe.org	https://www.herringpondtribe.org/
Mashpee Wampanoag Tribe*	Brian Weeden, Chair	Brian.Weeden@mwtribe-nsn.gov	https://mashpeewampanoagtribe-nsn.gov/
Mass Audubon*	Heidi Ricci, Director of Policy	hricci@massaudubon.org	https://www.massaudubon.org/
Mass Climate Action Network (MCAN)*	Sarah Dooling, Executive Director	sarah@massclimateaction.net	https://www.massclimateaction.org/
Mass Community Labor United*	Lee Matsueda, Executive Director	lee@massclu.org	https://www.massclu.org/
Mass Land Trust Coalition*	Robb Johnson, Executive Director	robb@massland.org	https://massland.org/
Mass Rivers Alliance*	Julia Blatt, Executive Director	danielledolan@massriversalliance.org juliablatt@massriversalliance.org	https://www.massriversalliance.org/
Massachusetts Commission on Indian Affairs (MCIA) *	John Peters, Jr., Executive Director	john.peters@mass.gov	
Massachusetts Tribe at Ponkapoag*	Elizabeth Soloman	Solomon.Elizabeth.e@gmail.om	https://massachusetttribe.org/
Mystic River Watershed Association*	Melanie Gárate, Climate Resiliency Project Manager	melanie.garate@mysticriver.org	https://mysticriver.org/
	David Queeley, Director of Projects	david.queeley@mysticriver.org	
	Julie Wormser, Deputy Director	julie.wormser@mysticriver.org	
Neighbor to Neighbor*	Andrea Nyamekye, Associate Director	Andrea@n2nma.org elvis@n2nma.org	https://n2nma.org/en/
Neponset River Watershed Association*	Andres Ripley, Natural Resource Specialist	ripley@neponset.org	https://www.neponset.org/
New England United for Justice*	Noemi Mimi Ramos, Executive Director	mimi.neunited4justice@gmail.com	https://neu4j.org/
Nipmuc Nation (Hassanamisco Nipmucs) *	Cheryll Toney Holley, Chair	crwritings@aol.com	https://www.nipmucnation.org/

Table E.5-2 Primary Community Groups

Organization	Contact Name	Contact Information	Additional Information
North American Indian Center of Boston*	Raquel Halsey, Executive Director	rhalsey@naicob.org	http://www.naicob.org/
Ocean River Institute*	Rob Moir, Executive Director	rob@oceanriver.org	https://www.oceanriver.org/
Pocassett Wampanoag Tribe*	Cora Pierce	Coradot@yahooe.com	
Save the Harbor/Save the Bay*	Bruce Berman	Bruce@bostonharbor.com	https://www.savetheharbor.org/
Sierra Club MA*	Deb Pasternak, Director, MA Chapter	deb.pasternak@sierraclub.org	https://www.sierraclub.org/massachusetts
Sociedad Latina, Inc.	Jenna Clark, Workforce and Community Engagement Coordinator	jclark@sociedadlatina.org	Part of Greater Boston Latino Network (GBLN); Supports Latino youth and families regarding inequality and access within the community
Southwest Boston Community Development Coalition*	Patricia Alvarez	palvarez@swbcdc.org	https://www.swbcdc.org/
Stockbridge-Munsee Tribe*	Bonney Hartley, Historic Preservation Manager	bonney.hartley@mohican-nsn.gov	https://www.mohican.com/
The Massport Community Advisory Committee (MCAC)	Aaron Toffler, Executive Director	atoffler@massportcac.org	https://massportcac.org/
The Trust for Public Land*	Kelly Boling, MA and RI State Director	kelly.boling@tpl.org	https://www.tpl.org/
The Trustees of Reservations*	Linda Orel, Director of Policy	lorel@thetrustees.org	https://thetrustees.org/
Unitarian Universalist Mass Action Network*	Claire B.W. Muller, Movement Building Director	claire@uumassaction.org	https://www.uumassaction.org/

Table E.5-2 Primary Community Groups

Organization	Contact Name	Contact Information	Additional Information
Wampanoag Tribe of Gay Head (Aquinnah)*	Bettina Washington, Tribal Historic Preservation Officer	thpo@wampanoagtribe-nsn.gov	https://wampanoagtribe-nsn.gov/
Winthrop Commission for Diversity, Inclusion, and Community Relations	Denise Quist	(617) 846-1742	https://www.town.winthrop.ma.us/commission-diversity-inclusion-and-community-relations

* Included in EJ Reference List provided by MEPA.

EJ Outreach Plan and Strategy

Massport is committed to inclusion efforts and is implementing EJ outreach strategies to encourage community members to engage in the MEPA and NEPA processes and Project discussions. This plan outlines stakeholder engagement strategies and actions to meet MEPA and NEPA requirements. Massport has consulted with the MEPA Office and the EEA EJ director to develop the EJ Outreach Plan.

Massport has identified a team to coordinate and facilitate EJ outreach and engagement to promote effective communication and level of involvement of EJ stakeholders. Team staff members are listed in **Table E.5-3**.

Table E.5-3 Massachusetts Port Authority Team Staff Members

Project Team Role	Project Team Member	Address/Phone/Email
Senior Project Manager	Sarah Dennechuk	Massachusetts Port Authority One Harborside Drive, Suite 200S East Boston, MA 02128 sdennechuk@massport.com (617) 568-5971
Deputy Director Environmental Planning and Permitting	Stewart Dalzell	Massachusetts Port Authority One Harborside Drive, Suite 200S East Boston, MA 02128 sdalzell@massport.com (617) 568-3524
Public Affairs	Michael Vatalaro	Massachusetts Port Authority One Harborside Drive, Suite 200S East Boston, MA 02128 MVatalaro@massport.com (617) 568-3735
Massport Noise Abatement Officer	Flavio Leo	Massachusetts Port Authority One Harborside Drive, Suite 200S East Boston, MA 02128 FLeo@massport.com (617) 561-3333

The outreach team will follow and build upon Massport's current public outreach efforts, which includes meetings, notifications, online tools, and other resources. These resources will be made fully accessible to the public and EJ stakeholders to optimize public participation. Massport regularly engages with the MCAC for Project updates and input. In addition to stakeholders and individuals involved in the MCAC meetings, Massport has and will continue to offer discussions with elected officials and key stakeholders to provide adequate support of EJ populations during the process.

The EJ Outreach Plan includes:

- Making translations available in Spanish, including through the Project website and notifications to local EJ and community groups.
- Providing information on how to request additional language translation services on meeting invitations and outreach materials.
- Providing a call-in option for virtual meetings for those with limited technology access.

The team will identify other opportunities for communicating with EJ communities with limited technology access. These options include, but are not limited to, paper mailers instead of email communication in both Spanish and English, alternative paper feedback forms, one-page flyers for distribution at locations that are frequented by EJ populations, and an effort to provide mostly in-person meetings when COVID-19 protocols allow Massport to do so safely. Notification of public meetings, filings, and permit applications will be placed at traditional repositories and non-traditional information repositories, such as houses of worship, community centers, community web sites, and other means as appropriate. The expected schedule for the environmental review and construction is summarized in **Table E.5-4.**

Table E.5-4 Expected Environmental Review and Construction Schedule

Permit/Filing	Anticipated Date
MEPA ENF Filing	August 30, 2021 (actual)
Draft EIR	June 30, 2022 (actual)
Draft EA/Final EIR	December 15, 2022 (actual)
MEPA decision issued	Winter 2023
NEPA decision issued	Spring 2023
File permit applications	2023
Final Design	2023 – 2024
Construction	2025 – 2026

In preparation for these meetings, Massport has and will continue to reach out to the local and state elected officials, representatives in East Boston and Winthrop, the MCAC, and community groups surrounding the Project Site. Notice of the meetings are to be placed in the *Boston Herald*, *East Boston Times*, *Winthrop Transcript*, and *El Mundo*, as well as on Massport's website at www.massport.com. Massport will share meeting promotional materials with various state, city, and community stakeholders to increase engagement within their constituency. The outreach team will provide pre-meeting discussions with key stakeholders to ensure important topics and any concerns are incorporated into the public meeting. A press release will follow public meetings. Direct communication with the outreach

team may be directed to MVatalaro@massport.com. Massport plans to solicit feedback throughout the Project timeline for the overall EJ engagement and involvement process via a stakeholder survey.

The public outreach conducted to date and the planned future outreach can be found in **Table E.5-5**. **Table E.5-6** summarizes the Project filings and anticipated construction schedule.

Table E.5-5 Outreach Timeline

Date	Outreach Type	Outreach Method
July 30, 2019	Environmental Status and Planning Report (ESPR)	Initial Project description and status presented in 2017 ESPR.
December 31, 2020	Environmental Data Report (EDR)	Project description and status presented in 2018/2019 EDR.
February 23, 2021	ENF Agency Consultation Meeting	Approximately 25 agency representatives attended a project briefing and discussion led by Massport. Attendees represented the FAA, MEPA, Massachusetts Department of Environmental Protection (MassDEP), Massachusetts Natural Heritage and Endangered Species Program (NHESP), Massachusetts Division of Marine Fisheries (DMF), U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, Massachusetts Office of Coastal Zone Management (CZM), U.S. Environmental Protection Agency (USEPA), and U.S. Army Corps of Engineers (USACE).
June 29, 2021	ENF Pre-Filing Virtual Meeting	Translated project summary on Massport website (remains available) and in meeting invite. Public notices in English and Spanish published in *East Boston Times*, *Winthrop Transcript*, and *El Mundo*. Phone calls/emails to MCAC, elected officials, neighborhood associations, organizations. Spanish translation during meeting.
August 31, 2021	ENF Filing	Filing posted on Massport's website. Translated Project summary on Massport's website (remains available). Distribution included agencies, municipalities from the surrounding area, MCAC, and community organizations. ENF public notice translated in Spanish and published in the *Boston Herald*.
September 22, 2021	ENF Virtual Consultation Session/Public Meeting	Translated Project summary on Massport's website (remains available). Distribution included agencies, municipalities from surrounding area, MCAC, and community organizations. ENF public notice translated in Spanish and published in the Boston Herald. Spanish translation provided during the meeting.
June 6, 2022	DEIR Agency Consultation Meeting	Approximately 12 agency representatives attended a project briefing and discussion led by Massport. Attendees represented MassDEP, NHESP, DMF, NOAA Fisheries, CZM, USEPA, and Boston Conservation Commission (BCC).

Date	Outreach Type	Outreach Method
June 30, 2022	DEIR Filing	Emailed to the EJ Reference List provided by MEPA. Executive summary translated in Spanish and posted on Massport's website. Posted a social media announcement notifying the public of the filing
July 20, 2022	DEIR Public Meeting	Translated project summary on Massport website (remains available) and in meeting invite. Public notices in English and Spanish published in Boston Herald, *East Boston Times*, *Winthrop Transcript*, and *El Mundo*. Spanish translation during meeting.
December 15, 2022	Draft EA/Final EIR	Posted a social media announcement notifying the public of the filing. Notice of Availability in English and Spanish published in *Boston Herald*, *East Boston Times*, *Winthrop Transcript*, and *El Mundo*. Circulated the *Draft EA/Final EIR* electronically to the EJ Reference List provided by MEPA. Translated the Notice of Availability and Executive Summary into Spanish and posted a copy on Massport's website. Posted the *Draft EA/Final EIR* on Massport's website at the time of the filing with MEPA, allowing for approximately an additional week of review time.

Table E.5-6 Construction Notifications

Timing	Outreach Type	Outreach Method
6 Months Prior to Construction	Public Notice	English and Spanish notice published in *Boston Herald*, *East Boston Times*, *Winthrop Transcript*, and *El Mundo* providing Project status update.
3 Months Prior to Construction	Public Notice	English and Spanish notice published in *Boston Herald*, *East Boston Times*, *Winthrop Transcript*, and *El Mundo* providing Project status update.
3 Months Prior to Construction	Virtual Public Meeting	Spanish translation streaming present.
2 Weeks Prior to Construction	Public Notice	English and Spanish notice published in *Boston Herald*, *East Boston Times*, *El Mundo*, and *Winthrop Times* providing Project status update.

Documentation of all feedback and surveys, letters, stakeholder communication, meeting notes and attendees, Project outcomes, and other EJ public engagement records will be kept by the team.

Appendix F- List of Preparers

This Page Intentionally Left Blank

List of Preparers

This chapter provides the names and qualifications of the principal persons contributing information to this document as required per Federal Aviation Administration (FAA) Orders 1050.1F and 5050.4B. In compliance with Section 1502.6 of Council on Environmental Quality (CEQ) regulations, the FAA and Massport employed the efforts of an interdisciplinary team of scientists, technicians, and experts in various fields to prepare this Draft Environmental Assessment (EA). Specialists included FAA and contractor support staff with expertise in air quality, noise assessment and abatement, Department of Transportation Act, Section 106, and other disciplines. While an interdisciplinary approach was used to develop the EA, all decisions regarding the EA scope and content were made by the FAA.

Table F-1 identifies the FAA staff responsible for reviewing the document and **Table F-2** identifies the support contractor staff who prepared the document.

Table F-1 FAA Reviewers

Name	Organization	Title	Role in Preparing the EA
Cheryl Quaine	FAA, New England Region Airports Division	Environmental Protection Specialist	Environmental lead, policy and program guidance

Table F-2 Document Preparers

Name	Organization	Education	Years of Experience	Role in EA Preparation
Stewart Dalzell	Massport	B.S., Biology	44	Director
Sarah Dennechuk, PE, CCM	Massport	B.S. Civil Engineering	23	Project manager
Flavio Leo	Massport	MA/MBA, Economics & Business	34	Noise, emissions, and air traffic
Brad Washburn	Massport	B.A., Political Science MRP	19	Natural resources
Chris Conley, PE	WSP	B. S. Civil Engineering	25	Airfield design
Joe Choi	WSP	B.S. Mechanical Engineering M.S. Civil Engineering	20	Marine structures and coastal processes
Amanda Decesare, PE, PMP	WSP	B. S. Civil Engineering	22	Project manager

Name	Organization	Education	Years of Experience	Role in EA Preparation
Marla Engel, AICP	WSP	B.A. Political Science M.R.P Regional Planning	38	NEPA analysis; document and appendices preparation
Ahintha Kandamby, Ph.D., PE., CFM	WSP	B.S. Engineering MS Civil and Environmental Engineering Ph.D Civil and Environmental Engineering	12	Coastal processes
Robert Smith, PE	WSP	B.E. Civil Engineering	32	Marine structures
Bruce Wattle, QEP, CCM	WSP	B.S. Atmospheric and Oceanic Science	42	Air quality analysis
Kristen Bergassi, ENV SP	VHB	B.S. Earth Systems	21	NEPA analysis; document and appendices preparation
Gene Crouch	VHB	B.A. Biology	48	NEPA technical analyses, Natural Resources, Chapter 91
Olympia Fisher	VHB	B.A. Politics B.A. Geology	2	Technical analysis, document production, and editing
Carol Lurie, AICP, LEED AP, ENV SP	VHB	B.S. Town and Regional Planning M.S. Community Planning	43	Senior Technical Advisor, NEPA analysis; document and appendices preparation
Quinn Stuart	VHB	M.A. Historic Preservation	16	Section 106/historic resources
Casey Venzon, LEED AP	VHB	B.A. Economics & Business Administration	14	Technical manager; NEPA analysis; document and appendices preparation
Christopher Bajdek	HMMH	B.S. Mechanical Engineering	32	Noise analysis
Robert C. Mentzer Jr.	HMMH	B.S. Meteorology	32	Noise analysis

Appendix G- Distribution List

This Page Intentionally Left Blank.

Distribution List

The Draft Environmental Assessment/Final Environmental Impact Report (Draft EA/Final EIR) for the Runway 27 End RSA Improvements Project will be circulated and distributed in accordance with recipients as noted in FAA *Order 5050.4B, Paragraph 708* and in 301 CMR 11.16 (3). This distribution list also includes representatives of governmental agencies and community groups and/or local residents interested with activities at Logan Airport. The 'N' indicates Massport mailed or emailed a notice of availability including an electronic link to the Draft EA/Final EIR. The 'P' indicates Massport mailed a printed copy of the Draft EA/Final EIR.

This Draft EA/Final EIR is available on Massport's website (https://www.massport.com/logan-airport/about-logan/environmental-reports/). A limited number of printed copies of the Draft EA/Final EIR are available and may be requested from Stewart Dalzell, telephone (617) 568-3524, email: sdalzell@massport.com. Printed copies are available for review at the following public libraries.

Libraries			
P Boston Public Library Main Branch 700 Boylston Street Boston, MA 02116	P Chelsea Public Library 569 Broadway Chelsea, MA 02150	P Boston Public Library East Boston Branch 365 S. Bremen Street East Boston, MA 02128	P Boston Public Library Charlestown Branch 179 Main Street Charlestown, MA 02129
P Revere Public Library 179 Beach Street Revere, MA 02151	P Winthrop Public Library 2 Metcalf Square Winthrop, MA 02151		
Federal Government			
U.S. Senators and Representatives			
N The Honorable Ed Markey JFK Federal Building, Suite 975 15 New Sudbury Street Boston, MA 02203	N The Honorable Katherine Clark Attn: Kelsey Perkins U.S. House of Representatives 157 Pleasant Street, Suite 4 Malden, MA 02148	N The Honorable Stephen F. Lynch Attn: Nicholas Zaferakis U.S. House of Representatives One Harbor Street, Suite 304 Boston, MA 02210	N The Honorable Elizabeth Warren Attn: Olivia Paulo 2400 JFK Federal Building 15 New Sudbury Street Boston, MA 02203
N The Honorable Ayanna Pressley Attn: Eric White U.S. House of Representatives 1700 Dorchester Avenue Dorchester, MA 02124			
U.S. Environmental Protection Agency			
N Deborah Szaro U.S. Environmental Protection Agency, New England Region 5 Post Office Square – Ste 100 Mail Code ORA 17-1 Boston, MA 02109-3912	N Timothy Timmermann, Director National Environmental Policy Act Office EPA New England (Region 1) 5 Post Office Square – Suite 100 Boston, MA 02109-3912	N EPA New England (Region 1) Attn: NPDES Permit Division 5 Post Office Square – Suite 100 Boston, MA 02109-3912	N Philip Colarusso EPA New England (Region 1) 5 Post Office Square – Suite 100 Boston, MA 02109-3912

Federal Aviation Administration

P Gail Lattrell, Director
Federal Aviation Administration
New England Region
1200 District Avenue
Burlington, MA 01803

P Cheryl Quaine, Environmental Protection Specialist
Federal Aviation Administration,
New England Region
Airports Division
1200 District Avenue
Burlington, MA 01803

P Lisa Lesperance
Lead Community Planner
Federal Aviation Administration,
New England Region
Airports Division
1200 District Avenue
Burlington, MA 01803

N Chris Quigley, Tower Manager
Department of Transportation
Federal Aviation Administration
Logan International Airport
600 Control Tower, 19th Floor
East Boston, MA 02128

National Oceanic and Atmospheric Administration

N Chris Boelke
Chief, New England Branch
Greater Atlantic Regional
Fisheries Office
55 Great Republic Drive
NOAA Fisheries Service
Gloucester, MA 01930

N Kaitlyn Shaw
Greater Atlantic Regional
Fisheries Office
55 Great Republic Drive
NOAA Fisheries Service
Gloucester, MA 01930

U.S. Army Corps of Engineers

N Paul Sneeringer
Project Manager
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

U.S. Fish and Wildlife Service

N Kyla Hastie
Acting Regional Director
Northeast Region
300 Westgate Center Drive
Hadley, MA 01035

N David Simmons
Northeast Region
300 Westgate Center Drive
Hadley, MA 01035

U.S. Coast Guard

N Timothy Chase
Network Engineer
427 Commercial Street
Boston, MA 02109

State Government

Department of Environmental Protection

N MEPA Coordinator
Northeast Regional Office
Department of Environmental Protection
150 Presidential Way
Woburn, MA 01801
john.d.viola@mass.gov

N Commissioner's Office
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114
helena.boccadoro@mass.gov

N Glenn Keith, Director
Air and Climate Division
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114

N Sharon Weber, Deputy Director
Air and Climate Division
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114

N Daniel Padien, Director
Boston Waterways Regulation Program
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114
DEP.Waterways@mass.gov

N Bureau of Waste Site Cleanup Section Chief
Permits/Risk Reduction - NERO
Department of Environmental Protection
150 Presidential Way
Woburn, MA 01801

N Lisa Rhodes, Director
Wetlands Program Division
Department of Environmental Protection
100 Cambridge Street, 9th Floor
Boston, MA 02114

N John D. Viola
Deputy Regional Director
Northeast Regional Office
Department of Environmental Protection
150 Presidential Way
Woburn, MA 01801

N Rachel Freed
Deputy Regional Director
Bureau of Water Resources
Northeast Regional Office
Department of Environmental Protection
150 Presidential Way
Woburn, MA 01801

N David Hilgeman
Senior Environmental Engineer
Department of Environmental Protection
David.Hilgeman@mass.gov

N Philip DiPietro
Environmental Engineer
Department of Environmental Protection
philip.dipietro@mass.gov

N Thomas Maguire
Department of Environmental Protection
thomas.maguire@mass.gov

Senate/House of Representatives

N Senate President Karen Spilka
Massachusetts State House
24 Beacon Street, Room 332
Boston, MA 02133

N Senator Lydia Edwards
Massachusetts State House
24 Beacon Street, Room 520
Boston, MA 02133

N Representative Marcos A. Devers, Vice Chair
Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Room 134
Boston, MA 02133

N Speaker of the House
Ronald Mariano
Massachusetts State House
24 Beacon Street, Room 356
Boston, MA 02133

Senate/House of Representatives (Continued)

N Representative William M Straus
Chair, Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Room 134
Boston, MA 02133

N Representative Adrian Madaro
Massachusetts State House
24 Beacon Street, Room 33
Boston, MA 02133

N Senator Brendan P. Crighton
Chair, Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Rm 109-C
Boston, MA 02133

Executive Office of Energy and Environmental Affairs (EEA)

N Beth Card, Secretary
Executive Office of EEA
100 Cambridge Street, Ste 900
Boston, MA 02114
env.internet@mass.gov

N Tori Kim, Assistant Secretary and MEPA Director
Executive Office of EEA, MEPA Office
100 Cambridge St, Ste 900
Boston, MA 02114
tori.kim@mass.gov

P MEPA Analyst
N Executive Office of EEA
MEPA Office
100 Cambridge St, Ste 900
Boston, MA 02114
MEPA@mass.gov

N Rishi Reddi
Director of Environmental Justice
Executive Office of Energy and Environmental Affairs
MEPA-EJ@mass.gov

Metropolitan Area Planning Council (MAPC)

N Marc Draisen
MAPC Executive Director
60 Temple Place
Boston, MA 02111

N Eric Bourassa
MAPC Transportation Director
60 Temple Place, 6th Floor
Boston, MA 02111

N Martin Pillsbury
MAPC Director
Environmental Planning
60 Temple Place, 6th Floor
Boston, MA 02111

Central Transportation Planning Staff (CTPS)

N Tegin Teich
Executive Director
CTPS
10 Park Plaza, Room 2150
Boston, MA 02116

N Gina Perille
Deputy Executive Director
CTPS
10 Park Plaza, Room 2150
Boston, MA 02116

Massachusetts Division of Fisheries and Wildlife

N Everose Schluter
Assistant Director
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

Coastal Zone Management

N Lisa Berry Engler, Director
Office of Coastal Zone Management
251 Causeway Street, Suite 800
Boston, MA 02114

N Coastal Zone Management
Attn: Robert Boeri,
Project Review and Dredging Coordinator
251 Causeway Street, Suite 800
Boston, MA 02114-2138
robert.boeri@mass.gov

N Coastal Zone Management
Attn: Patrice Bordonaro,
Project Review
251 Causeway Street
Suite 800
Boston, MA 02114-2138

N Joanna Yelen
Boston Harbor Coordinator
251 Causeway Street
Suite 800
Boston, MA 02114-2138

Commonwealth of Massachusetts Division of Marine Fisheries

N Daniel J. McKiernan, Director
Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, MA 02114

N Tay Evans
Environmental Review
Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, MA 02114

N Forest Schenck
Division of Marine Fisheries
Annisquam River Marine Fisheries Field Station
30 Emerson Ave.
Gloucester, MA 01930
Forest.Schenck@mass.gov

N Jeff Kennedy
Program Manager
Shellfish Program
Division of Marine Fisheries
jeff.kennedy@mass.gov

N Gregg Bettencourt
Regional Shellfish Supervisor
Shellfish Program
Division of Marine Fisheries
greg.bettencourt@mass.gov

Massachusetts Department of Transportation

N Jamey L. Tesler
Secretary of Transportation
MassDOT
10 Park Plaza, Suite 4160
Boston, MA 02116

N Jonathan L. Gulliver
Administrator
MassDOT Highway
10 Park Plaza, Suite 7410
Boston, MA 02116

N MassDOT District 6
Attn: MEPA Coordinator
185 Kneeland Street
Boston, MA 02111
michael.garrity@dot.state.ma.us

N MassDOT Public/Private Development Unit
10 Park Plaza, Suite #4150
Boston, MA 02116
MassDOTPPDU@dot.state.ma.us

N Jeffrey DeCarlo, Administrator
MassDOT Aeronautics
Logan Office Center
One Harborside Drive, Ste 205N
East Boston, MA 02128-2909

Massachusetts Secretary of the Commonwealth

N William Francis Galvin
Secretary of the Commonwealth
220 Morrissey Boulevard
Boston, Massachusetts 02125

Office of the Attorney General

N Meghan Davoren
Environmental Protection Div.
Office of the Attorney General
One Ashburton Place, 18th Flr
Boston, MA 02108

Department of Energy Resources

N Paul F. Ormond
P.E., Efficiency Division
Dept of Energy Resources
100 Cambridge Street,
Suite 1020
Boston, MA 02114
paul.ormond@mass.gov

Massachusetts Water Resources Authority

N Massachusetts Water
Resources Authority
Attn: MEPA Coordinator
100 First Avenue, Building 39
Charlestown Navy Yard
Boston, MA 02129
katherine.ronan@mwra.com

Massachusetts Historical Commission

P Massachusetts Historical
Commission
The MA Archives Building
220 Morrissey Boulevard
Boston, MA 02125

Natural Heritage and Endangered Species Program (NHESP)

N Amy Hoenig
NHESP
Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough, MA 01581
amy.hoenig@mass.gov

The Commonwealth Board of Massachusetts Board of Underwater Archaeological Resources

N David S. Robinson, Director
Board of Underwater
Archaeological Resources
251 Causeway Street, Suite 800
Boston, MA 02114-2136
david.robinson@mass.gov

Federally Recognized Tribes in Massachusetts

N Bettina Washington, Tribal
Historic Preservation Officer
Wampanoag Tribe of Gay Head
(Aquinnah)
20 Black Brook Road
Aquinnah, MA 02535
thpo@wampanoagtribe-nsn.gov

N Brian Weeden, Chair
Mashpee Wampanoag Tribe
483 Great Neck Road S
Mashpee, MA 02649
Brian.Weeden@mwtribe-nsn.gov

N Bonney Hartley
Historic Preservation Manager
Stockbridge-Munsee Tribe
MA
bonney.hartley@mohican-nsn.gov

Municipalities

City of Boston

Office of the Mayor

N Michelle Wu, Mayor
City of Boston
One City Hall Square, Suite 500
Boston, MA 02201

Boston Transportation Department

N Brad Gerratt
Interim Commissioner, Boston
Transportation Department
One City Hall Square, Room 721
Boston, MA 02201

Boston Planning & Development Agency

N Arthur Jemison
Chief of Planning, Boston
Planning and Development y
One City Hall Square, 9th Flr
Boston, MA 02201

City Clerk's Office

N Alex Geourntas
Boston City Clerk
One City Hall Square, Room 601
Boston, MA 02201

Boston Environment Department

N Dr. Alison Brizius
City of Boston Environment
Department
One City Hall Square, Rm 709
Boston, MA 02201

Environmental Services Cabinet

N Rev. Mariama White-Hammond
Chief of Environment Energy,
and Open Space
One City Hall Square, Room 709
Boston, MA 02201

Boston Water and Sewer Commission

N John Sullivan, Chief Engineer
Boston Water and
Sewer Commission
980 Harrison Avenue
Boston, MA 02119

Boston City Council

N Gabriela Coletta, District 1
1 City Hall Square
Suite 550
Boston, MA 02201-2043

Neighborhood Services

N Enrique Pepen, Director
Mayor's Office of
Neighborhood Services
1 City Hall Square, Room 805
Boston, MA 02201

Neighborhood Services

N Nathalia Benitez
City of Boston
1 City Hall Square, Room 805
Boston, MA 02201

Boston Public Health Commission

E Boston Public Health
Commission
1010 Massachusetts Ave,
2nd Floor
Boston, MA 02118
info@bphc.org

Boston Conservation Commission

E Kate Oetheimer
Boston Conservation
Commission
One City Hall Square, Room 709
Boston, MA 02201
nicholas.moreno@boston.gov

Town of Winthrop

N Terence Delehany Acting Town Manager Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Hannah Belcher, Chair Winthrop Air Pollution, Noise, and Airport Hazards Committee One Metcalf Square Winthrop, MA 02152	N Richard Bangs Winthrop Air Pollution, Noise, and Airport Hazards Committee One Metcalf Square Winthrop, MA 02152	N Bill Schmidt Winthrop Board of Health One Metcalf Square Winthrop, MA 02152
P Karen T Winn, Chair Winthrop Conservation Commission One Metcalf Square Winthrop, MA 02152	N James Letterie Council President Winthrop Town Hall One Metcalf Square Winthrop, MA 02152		

City of Chelsea	**City of Revere**
N Thomas Ambrosino City Manager Chelsea City Hall 500 Broadway Chelsea, MA 02150	N Brian Arrigo, Mayor City Hall 281 Broadway Revere, MA 02151

Community Groups and Interested Parties

MEPA Environmental Justice Reference List

Community-based organizations and tribal organizations are receiving project notifications in accordance with the MEPA Public Involvement Protocol for Environmental Justice Populations, which took effect on January 1, 2022. More information is available on the MEPA website.

N May Lui Community Outreach Coord. Asian Community Development Corporation Boston, MA may.lui@asiancdc.org	N Heather Miller Charles River Watershed Association Boston, MA hmiller@cwra.org	N Joy Gary, Executive Director Boston Farms Community Land Trust Boston, MA joy@bostonfarms.org	N Alice Brown Chief of Planning and Policy Boston Harbor Now Boston, MA abrown@bostonharbornow.org
N Karen Chen, Executive Director Chinese Progressive Assoc. Boston, MA karen@cpaboston.org	N Lee Matsueda Executive Director Mass Community Labor United Boston, MA lee@massclu.org	N Bruce Berman Save the Harbor/Save the Bay Boston, MA Bruce@bostonharbor.com	N Lydia Lowe, Executive Director Chinatown Community Land Trust Boston, MA lydia@chinatownclt.org
N Noemi Mimi Ramos Executive Director New England United for Justice Boston, MA mimi.neunited4justice@gmail.com	N Deb Fastino, Executive Director Coalition for Social Justice Boston, MA dfastino@aol.com	N Laura Jasinski Executive Director Charles River Conservancy Boston, MA ljasinski@thecharles.org	N Andres Ripley Natural Resource Specialist Neponset River Watershed Association Boston, MA ripley@neponset.org
N Patricia Alvarez Southwest Boston Community Development Coalition Boston, MA palvarez@swbcdc.org	N Hing Sang Chinatown Residence Association Boston, MA chinatownresidents@gmail.com	N Maria Belen Power Associate Executive Director GreenRoots, Inc. East Boston, MA mariabelenp@greenrootschelsea.org	N Melanie Gárate, Mgr Climate Resiliency Project Mystic River Watershed Association Winthrop, MA melanie.garate@mysticriver.org
N David Queeley Director of Projects Mystic River Watershed Association East Boston, MA david.queeley@mysticriver.org	N Julie Wormser, Deputy Director Mystic River Watershed Association East Boston, MA julie.wormser@mysticriver.org	N Gail Miller, President Air, Inc. East Boston, MA gailmiller48@icloud.com cbmarchi@gmail.com	N Eugene Benson, Former City Planning & Urban Affairs Professor GreenRoots, Inc. East Boston, MA eugene.benson@gmail.com
N Brian Weeden, Chair Mashpee Wampanoag Tribe Brian.Weeden@mwtribe-nsn.gov	N Julia Blatt, Executive Director Mass Rivers Alliance danielledolan@massriversalliance.org juliablatt@massriversalliance.org	N Andrea Nyamekye Associate Director Neighbor to Neighbor Andrea@n2nma.org elvis@n2nma.org	N Ben Hellerstein MA State Director Environment Massachusetts ben@environmentmassachusetts.org
N Claire B.W. Muller Movement Building Director Unitarian Universalist Mass Action Network claire@uumassaction.org	N Cindy Luppi New England Director Clean Water Action cluppi@cleanwater.org	N Deb Pasternak Director, MA Chapter Sierra Club MA deb.pasternak@sierraclub.org	N Heather Clish, Director of Conservation & Recreation Policy Appalachian Mountain Club hclish@outdoors.org

MEPA Environmental Justice Reference List (continued)

N Heidi Ricci, Director of Policy Mass Audubon hricci@massaudubon.org	N Kelly Boling MA & RI State Director The Trust for Public Land kelly.boling@tpl.org	N Kerry Bowie, Board President Browning the GreenSpace kerry@msaadapartners.com	N Linda Orel, Director of Policy The Trustees of Reservations lorel@thetrustees.org
N Nancy Goodman Vice President for Policy Environmental League of MA ngoodman@environmentalleague.org	N Pat Stanton, Project Manager E4TheFuture pstanton@e4thefuture.org	N Rob Moir, Executive Director Ocean River Institute rob@oceanriver.org	N Robb Johnson Executive Director Mass Land Trust Coalition robb@massland.org
N Sarah Dooling Executive Director Mass Climate Action Network (MCAN) sarah@massclimateaction.net	N Staci Rubin, Senior Attorney Conservation Law Foundation srubin@clf.org	N Sylvia Broude, Executive Director Community Action Works sylvia@communityactionworks.org	N Winston Vaughan Director of Climate Solutions Healthcare without Harm wvaughan@hcwh.org
N Elizabeth Soloman Massachusetts Tribe at Ponkapoag Solomon.Elizabeth.e@gmail.com	N Cheryll Toney Holley, Chair Nipmuc Nation (Hassanamisco Nipmucs) crwritings@aol.com	N John Peters, Jr. Executive Director Massachusetts Commission on Indian Affairs (MCIA) john.peters@mass.gov	N Kenneth White Council Chairman Chaubunagungamaug Nipmuck Indian Council acw1213@verizon.net
N Melissa Ferretti, Chair Herring Pond Wampanoag Tribe melissa@herringpondtribe.org	N Patricia D. Rocker, Council Chair Chappaquiddick Tribe of the Wampanoag Nation, Whale Clan rockerpatriciad@verizon.net	N Raquel Halsey Executive Director North American Indian Center of Boston rhalsey@naicob.org	N Cora Pierce Pocassett Wampanoag Tribe Coradot@yahoo.com
N Alma Gordon, President Chappaquiddick Tribe of the Wampanoag Nation tribalcouncil@chappaquiddick-wampanoag.org			

Massport Community Advisory Committee (MCAC)

N Roseann Bongiovanni Chairwoman Massport Community Advisory Committee 300 Washington Street Brookline, MA 02445	N Aaron Toffler, Executive Director Massport Community Advisory Committee 300 Washington Street Brookline, MA 02445 atoffler@massportcac.org

Logan Badged Shellfishers

P Bob Stanley, Master Digger
Stanley Seafood
833 N Shore Road
Revere, MA 02151

East Boston Community

N Rachel Blomerth, Co-Chair Jeffries Point Neighborhood Association 184 Webster Street East Boston, MA 02128	N Debra Cave, President Eagle Hill Civic Association 106 White Street East Boston, MA 02128	N Mary Berninger 156 Saint Andrew Road East Boston, MA 02128	N Karen Maddalena Friends of the East Boston Greenway 4 Lamson Street East Boston, MA 02128
N Matthew Barison Harborview Community Association East Boston, MA 02128	N Gove Street Neighborhood Association 36 Frankfort Street East Boston, MA 02128	N Noah Lewkowitz Orient Heights Neighborhood Association 54 Ashley Street East Boston, MA 02128	N Patricia D'Amore 95 Webster Street East Boston, MA 02128
N Matthew Small 156 Porter Street Condo Association 156 Porter Street East Boston, MA 02128	N Veronica Robles, President East Boston Chamber of Commerce 464 Bremen Street, Suite 2 East Boston, MA 02128	N Lorene Schettino East Boston Foundation 245 Sumner Street, Suite 110 East Boston, MA 02128	N Gladys Oliveros Executive Director East Boston Main Streets 154 Maverick Street, Suite 210 East Boston, MA 02128
N Dean Hashimoto East Boston Neighborhood Health Center 153 Westchester Road Newton, MA 02158	N Gail Miller, President Airport Impact Relief, Inc. 232 Orient Avenue East Boston, MA 02128	N Michelle Moon East Boston Greenway 215 Summer Street Somerville, MA 02143	N Gloribell Mota, Lead Organizer Neighbors United for a Better East Boston 19 Meridian Street, Suite 4 East Boston, MA 02128
N Margaret Farmer, Co-Chair Jeffries Point Neighborhood Association 241 Webster Street East Boston, MA 02128	N Dr. Jackie S. Fantes Chief Medical Officer East Boston Neighborhood Health Center 10 Gove Street East Boston, MA 02128	N Albert Mangini Immediate Past President East Boston Chamber of Commerce 464 Bremen Street, Suite 2 East Boston, MA 02128	N AIR, Inc 395 Maverick Street East Boston, MA 02128

Winthrop Community

N Winthrop Chamber of Commerce 207 Hagman Road Winthrop, MA 02152	N Cottage Park Yacht Club 76 Orlando Ave Winthrop, MA 02152	N John Vitagliano 19 Seymour Street Winthrop, MA 02152	N Winthrop Yacht Club 649 Shirley Street Winthrop, MA 02152
N Margaret Roberts 10 Billows Street Winthrop, MA 02152 rmargaret120@outlook.com	N Miriam Regan-Fiore 15 Frances Street Winthrop, MA 02152	N Jerry E. Falbo 1 Seal Harbor Road, Unit 505 Winthrop, MA 02152	N Robert Pulsifer 30 Sagamore Avenue Winthrop, MA 02152

Other DEIR and ENF Commenters

N Kathy Abbott, President and CEO Boston Harbor Now 15 State St #1100 Boston, MA 02109	N Frank Kerr Hull Neighbors for Quiet Skies 33 Holbrook Avenue Hull, MA 02045	N Dawn Quirk 78 Morgan Street New Bedford, MA 02740

This Page Intentionally Left Blank

Appendix H- Literature Cited

This Page Intentionally Left Blank.

Literature Cited

Ackerman, S. D., Butman, B., Barnhardt, W. A., Danforth, W. W., and Crocker, J. M., Massachusetts: U.S. Geological Survey Open-File Report 2006-1008, DVD-ROM, *High-resolution Geologic Mapping of the Inner Continental Shelf; Boston Harbor and Approaches*, 2006, http://pubs.usgs.gov/of/2006/1008/.

Boston Planning & Development Agency, Boston Redevelopment Authority, *Regulations Applicable in the Logan International Airport Subdistrict,* Section 53-38 to 41, Codified through Acts of 2020, Ch. 365, enacted January 14, 2021, http://www.bostonplans.org/getattachment/2662a796-0f21-4788-8903-2b7c3370a0b2.

California Department of Transportation by ICF Jones & Stokes & Illingworth and Rodkin, Inc., *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish*, February 2009, http://www.dot.ca.gov/hq/env/bio/files/Guidance_Manual_2_09.pdf.

City of Boston, Air Pollution Control Commission, *Regulations for the Control of Noise in the City of Boston*, September 13, 2022. https://www.boston.gov/sites/default/files/embed/n/noise_reg_boston.pdf.

Commonwealth of Massachusetts, *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*, January 28, 2021. https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8.

Commonwealth of Massachusetts, *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs*, June 24, 2021, https://www.mass.gov/doc/environmental-justice-policy6242021-update/download.

Commonwealth of Massachusetts, *MA DPH Environmental Justice Tool,* October 19, 2022, accessed October 31, 2022. https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html.

Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs, *Revised MEPA Greenhouse Gas Emissions Policy and Protocol*, Effective May 5, 2020. https://www.mass.gov/doc/greehouse-gas-emissions-policy-and-protocol/download.

Congressional Bill H.R. 3058: Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia, and Independent Agencies Appropriations Act, 2006; Public Law 109–115, November 30, 2005, 119 STAT. 2401.

Council on Environmental Quality, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy*, Title 40 Code of Federal Regulations Parts 1500-1508, May 20, 2022.

eBird, *BHI Bird Guide: Snake Island*, Accessed May 20, 2022. https://ebird.org/hotspot/L454182.

Fisheries Hydroacoustic Working Group, *Memorandum on the Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities*, June 12, 2008. https://semspub.epa.gov/work/01/550571.pdf.

Institute for Sustainable Infrastructure, *Envision Sustainable Infrastructure Framework Guidance Manual*, Version 3, 2018, https://sustainableinfrastructure.org/wp-content/uploads/EnvisionV3.9.7.2018.pdf.

Massachusetts Emergency Management Agency, *Massachusetts Hurricane Inundation Zones,* 2022. https://memamaps.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fab594f51b114342af9a597d24120026.

Massachusetts Port Authority, *Floodproofing Design Guide*, November 2014, revised November 2018, https://www.massport.com/media/2xacmacm/massport-floodproofing-design-guide-revised-november-2018.pdf.

Massachusetts Port Authority Enabling Act, Chapter 465 of the Acts of 1956, Section 4, Paragraph 6, 1959, https://www.mass.gov/doc/massachusetts-port-authority-1/download.

Massachusetts Port Authority, *Runway 9-27 End RSA Improvements Project, Environmental Notification Form*, August 2021. Available at: https://www.massport.com/media/4xdlv5rz/9-27-enf_compiled_final_083021.pdf.

Massachusetts Port Authority, Draft Environmental Impact Report, EEA# 16433, *Runway 27 End Runway Safety Area Improvements Project*, Boston Logan International Airport, June 30, 2022, https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Massachusetts Port Authority, Boston Logan Airport, *Runway Incursion Mitigation Study, Runway 9-27 Runway Safety Area (RSA) Alternatives Study*, January 8, 2019. Available at: https://www.massport.com/media/mmfovvkx/bos-rw27-rsa-draft-eir-063022.pdf.

Massachusetts Port Authority, *Boston Logan International Airport 2018/2019 Environmental Data Report*, December 2020. https://www.massport.com/media/41rkxcxd/2018-19-edr_final-part-1.pdf.

MassGIS, *2020 Environmental Justice Populations,* June 2021. https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

National Oceanic and Atmospheric Administration, *Essential Fish Habitat Mapper*, February 16, 2017. Accessed May 20, 2022. https://www.habitat.noaa.gov/apps/efhmapper/efhreport/.

National Oceanic and Atmospheric Administration, Navigation Chart: 13272, *Boston Inner Harbor,* Edition 55, October 1, 2019, https://www.charts.noaa.gov/OnLineViewer/13272.shtml.

National Oceanic and Atmospheric Administration, *Tide Predictions; 2022 Boston, MA. Highest Predicted Tidal Level, Datum NAVD, Datum for 8443970*, October 26, 2022. https://tidesandcurrents.noaa.gov/tide_predictions.html.

Popper, AN, and Hastings, M. C., *The effects of human-generated sound on fish*, Integrative Zoology 2009, https://www.nrc.gov/docs/ML1434/ML14345A581.pdf.

Rivers and Harbors Appropriation Act of 1899, Section 9 of 33 U.S.C. 401, *Construction of bridges, causeways, dams or dikes generally; exemptions*, February 16, 2022, https://www.epa.gov/cwa-404/section-9-rivers-and-harbors-appropriation-act-1899.

U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf.

U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5000-17, *Critical Aircraft and Regular Use Determination*, Section 3.10, June 20, 2017, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5000-17-Critical-Aircraft.pdf.

U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5220-22B, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns*, September 27, 2012, https://www.faa.gov/documentlibrary/media/advisory_circular/150_5220_22b.pdf.

U.S. Department of Transportation, Federal Aviation Administration, Order 1053.1C, *Energy and Water Management Program for FAA Buildings and Facilities*, October 26, 2017, https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1032066

U.S. Department of Transportation, Federal Aviation Administration, Report Number: AV-2009-039, *Actions Taken and Needed to Improvement FAA's Runway Safety Area Program Report*, March 3, 2009, https://www.oig.dot.gov/sites/default/files/11WEB_FILE_RSA_Report_03-3-09_Issued.pdf.

U.S. Department of Transportation, Federal Aviation Administration, *Engineered Material Arresting System (EMAS)*, January 5, 2022, https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=13754.

U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F: *Environmental Impacts: Policies and Procedures*, February 2020, https://www.faa.gov/documentlibrary/media/order/faa_order_1050_1f.pdf.

U.S. Department of Transportation, Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 28, 2006, https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/

U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B: *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019, https://www.faa.gov/documentLibrary/media/Order/Construction_5200_8.pdf.

U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports*, December 2018, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5370-10H.pdf.

U.S. Department of Transportation, Federal Aviation Administration, Order 5200.8, *Runway Safety Area Program*, October 1, 1999, https://www.faa.gov/documentLibrary/media/Order/Construction_5200_8.pdf.

U.S. Department of Transportation, Federal Highway Administration, *Hydraulic Engineering Circular No. 18 (HEC-18)*, August 26, 2020, https://www.fhwa.dot.gov/engineering/hydraulics/library_arc.cfm?pub_number=17&id=151.

U.S. Department of Transportation, Federal Highway Administration, *Roadway Construction Noise Model User's Guide*, January 2006, https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/rcnm00.cfm.

U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* FTA Report No. 0123, prepared by John A. Volpe National Transportation Systems Center, September 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

U.S Environmental Protection Agency, *Motor Vehicle Emissions Simulator (MOVES3)*, January 2021, https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves.

U.S. Environmental Protection Agency, Office of Transportation and Air Quality, Transportation and Climate Division, *Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions*, EPA-420-B-22-011, April 2022.

U.S. Environmental Protection Agency, AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, January 1995, as amended, https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors.

U.S. Environmental Protection Agency, *2021 Policy on Children's Health*, October 5, 2021, https://www.epa.gov/children/epas-policy-childrens-health

U.S. Fish and Wildlife Service, *Endangered Species Act of 1973*, Sections 7(a)-(d) of 16 U.S.C. 1536(a)-(d), December 28, 1973. https://www.fws.gov/law/endangered-species-act.

U.S. Fish and Wildlife Service, *Magnuson-Stevens Fishery Conservation and Management Act*, Public Law 94-265, as amended through June 12, 2007, https://fws.gov/law/fishery-conservation-and-management-act-magnuson-stevens-act.

Western Regional Air Partnership, *WRAP Fugitive Dust Handbook*, prepared for the Western Governors' Association by Countless Environmental, September 7, 2006.

The White House, Executive Office of the President, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, 62 Federal Register 19885, April 21, 1997, https://www.reginfo.gov/public/jsp/Utilities/eo_13045.pdf.

The White House, Executive Office of the President, Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, 86 Federal Register 7619, January 27, 2021, https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/.