

FINAL ENVIRONMENTAL ASSESSMENT/
ENVIRONMENTAL IMPACT REPORT
EOEEA #14442
JANUARY 2011



BOSTON-LOGAN INTERNATIONAL AIRPORT

Runway Safety Area

IMPROVEMENTS
PROJECT



PREPARED FOR
Massachusetts Port Authority
East Boston, Massachusetts



PREPARED BY
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January 31, 2011

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**Re: Boston-Logan International Airport Runway Safety Area Improvements Project
Final Environmental Assessment/Environmental Impact Report (EEA File #14442)**

Dear Secretary Sullivan, Director McDevitt and Mr. Doucette:

On behalf of the Massachusetts Port Authority (Massport), I am pleased to submit the Final Environmental Assessment/Environmental Impact Report (Draft EA/EIR) for the *Boston-Logan International Airport Runway Safety Area Improvements Project* for public review in accordance with the MEPA regulations. This document responds to all of the requirements of the Certificate issued after MEPA review of the Draft Environmental Assessment/Environmental Impact Report (EA/EIR). As was outlined in the ENF and the Draft EA/EIR, Massport has a continuing program of improving airfield safety at all of its airports. One of the major Boston-Logan International Airport ("Logan") initiatives is the enhancement of the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R. Federal Aviation Administration (FAA) policy requires that Massport modify the RSAs, 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. RSAs are safety features and do not extend runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the existing runways.

Because of Logan's location on Boston Harbor, the runway-end safety improvement at these runway end locations requires work in the intertidal and subtidal areas. Massport has worked closely with FAA to advance a design of the proposed safety improvements that avoids and minimizes impacts to the maximum extent practicable. However, there are no feasible alternatives that both meet FAA safety requirements and fully avoid marine resource impacts.

The Draft EA/EIR fully described the purpose of and need for the proposed safety improvements, the alternatives considered, the potential environmental impacts and outlined mitigation concepts for the proposed safety enhancements at both runway-ends. The Draft EA/EIR is provided on the enclosed CD. Through the efforts of interagency working groups composed of local, state and federal environmental resource agencies specially convened for this project, the Final EA/EIR is able to present detailed mitigation plans for the unavoidable impacts to salt marsh, eelgrass and shellfish. As the project proceeds through final design and permitting, with FAA input, Massport will continue to look for opportunities to further reduce construction-phase and long-term impacts to project area coastal resources.

At Runway-End 22R, a graded transition to mean low water, known as an Inclined Safety Area (ISA), is proposed. The ISA design will closely mirror the ISA permitted and constructed at Runway-End 22L in the early 1990s. The 22R ISA will affect salt marsh and a coastal beach/mud flat area supporting shellfish. These impacts will be offset by restoring nearly 3 acres of salt marsh and mudflat at Rumney Marsh in Saugus. As part of the project review

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with the MA Division of Marine Fisheries, Massport has also committed to funding of enhancements to local shellfish resources. Shellfishers that are authorized to harvest regulated areas at Logan Airport will have the opportunity to provide additional input into this program before it is finalized.

At Runway-End 33L, an extension to the existing Engineered Materials Arresting System (EMAS) is proposed. The design criteria of the safety improvements included careful consideration of avoidance and minimization of environmental impacts. Notably, to avoid harbor filling, the RSA extension at 33L is proposed as a 470-foot pile-supported deck incorporating EMAS, rather than the construction of FAA's more conventional 1,000-foot long filled structure. Furthermore, because of the unique environmental setting and the extraordinary cost of the type of structure proposed, the FAA has approved narrowing the RSA from 500-feet wide to no less than 300-feet wide. Even with these significant steps to avoid and minimize impacts, the project will affect an area of eelgrass at this runway-end. As outlined in Chapter 5 of the Final EA/EIR, to mitigate this impact, Massport will harvest existing eelgrass from within the project footprint and relocate those plants to two areas in Boston Harbor to reestablish eelgrass in those areas. This effort is expected to be another significant step in re-establishing eelgrass in Boston Harbor.

Massport has worked with the FAA and the MEPA Office to develop a concurrent MEPA and NEPA review for the Final EA/EIR. The 30-day public comment period for the Final EA/EIR would begin on February 9, 2011, with the publication of the next Environmental Monitor, and would conclude on March 11, 2011. This coordinated review will also serve as the federal public review for the FAA's draft Finding of No Significant Impact (FONSI) which is included as Attachment 1 of the document. All parties on the distribution list are being sent a copy of the Final EA/EIR or notice of availability and the document will be available for inspection at a number of public libraries and on Massport's website (www.massport.com).

We continue to appreciate that the schedule for the permitting of the Runway 33L critical safety improvements by 2013, and the Runway 22R ISA by 2015, is an aggressive one, but this is a very important project that must meet FAA's timetable for funding, commencement and completion. We greatly appreciate the time and attention that local, state and federal members of our Eelgrass and Salt Marsh Working Group(s) have provided. Their technical input and strategic guidance has significantly helped advance this safety project while at the same time developing a valuable mitigation program.

Together with the FAA, Massport hopes that you and other reviewers of the Final EA/EIR find that the document answers the questions raised during the Draft EA/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 contact me at (617) 568-3524 if you have any questions.

Very truly yours,

Massachusetts Port Authority



Stewart Dalzell, Deputy Director
Environmental Planning and Permitting

cc: A. Canaday/MEPA
L. Richards/Massport



Boston-Logan International Airport Runway Safety Area Improvements Project

Final Environmental Assessment/
Environmental Impact Report
EOEEA No. 14442

Prepared for **Massachusetts Port Authority**

Prepared by  ***Vanasse Hangen Brustlin, Inc.***

January 2011

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

A handwritten signature in blue ink, appearing to read "R. Dorell".

Responsible FAA Official

January 31, 2011

Date





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Acronyms

AC	Advisory Circular
ADCP	Acoustic Doppler Current Profiler
AEE	FAA's Office of Environment and Energy
ALSF	High-Intensity Approach Light System with Sequenced Flashing Lights
AOA	Aircraft Operating Area
ARC	Airport Reference Code
ARFF	Airport Rescue and Firefighting
ATVs	All Terrain Vehicles
BCC	Boston Conservation Commission
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPP	Basic Project Purpose
BTB	Boston Transportation Department
BWSC	Boston Water and Sewer Commission
CA/T	Central Artery/Tunnel
CAA	Clean Air Act
CBED	City of Boston Environmental Department
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CMR	Code of Massachusetts Regulations
CO	carbon monoxide
COD	Chemical Oxygen Demand
CTA	Central Testing Area
CWA	Clean Water Act
CZM	Massachusetts Office of Coastal Zone Management
CZMA	Federal Coastal Zone Management Act
dBA	A-weighted Decibel
DCR	Massachusetts Department of Conservation and Recreation
DEP	Massachusetts Department of Environmental Protection



DER	Massachusetts Department of Fish and Game Division of Ecological Restoration
DNL	Day-Night Average Sound Level
DMF	Massachusetts Division of Marine Fisheries
DO	Dissolved Oxygen
DOT OIG	U.S. Department of Transportation, Office of Inspector General
EA	Environmental Assessment
EDR	Environmental Data Report
EEA	Executive Office of Energy and Environmental Affairs (formerly the Executive Office of Environmental Affairs or EOEA)
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EMAS	Engineered Materials Arresting System
ENF	Environmental Notification Form
EO	Executive Order
ERDC	Environmental Research and Development Center
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding Of No Significant Impact
GHG	Green House Gas
GPS	Global Positioning System
HEC-18	Federal Highway Administration's Hydraulic Engineering Circular No. 18
HILR	High Intensity Runway Edge lights
ILF	In-Lieu Fee Program
ILS	Instrument Landing System
ISA	Inclined Safety Area
LOS	Level of Service
L10	A-weighted sound level exceeded 10 percent of the time
L _{dn}	Day-night average sound level
L _{eq}	Average background sound level
L _{max}	Maximum sound level
L _{peak}	Peak Sound Level
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment
MassGIS	Massachusetts Geographic Information System



MA WPA	Massachusetts Wetland Protection Act
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
M.G.L.	Massachusetts General Law
MGP	Massachusetts General Permit (Section 404)
MLW	Maximum Landing Weight
MOU	Memorandum of Understanding
MTOW	Maximum Takeoff Weight
MWRA	Massachusetts Water Resources Authority
NaAc	Sodium Acetate
NAAQS	National Ambient Air Quality Standards
Navaid	Navigational aid
NEPA	National Environmental Policy Act
NepRWA	Neponset River Watershed Association
NGVD	National Geodetic Vertical Datum
NHESP	Massachusetts Natural Heritage and Endangered Species Program
NMFS	National Marine Fisheries Service
NO ₂	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	Nonpoint Source
NTU	Nephelometric Turbidity Units
O ₃	Ozone
O&M	Operations and Maintenance
OOC	Order of Conditions
ORW	Outstanding Resource Waters
OSHA	Occupational Safety and Health Administration
OWMM	open-water marsh management
PAPI	Precision Approach Path Indicator
Pb	Lead
PM	Particulate Matter
PRAS	Preferential Runway Advisory System
psi	Pounds per square inch
RCRA	Resource Conservation and Recovery Act



RCNM	Roadway Construction Noise Model
RMS	Root mean square
ROMS	Regional Ocean Modeling System
RPZ	Runway Protection Zone
RSA	Runway Safety Area
SAS	Special Aquatic Sites
SAV	Submerged Aquatic Vegetation
SEL	Sound Exposure Level
SIP	State Implementation Plan
SO _x	Sulfur Oxides
SPCC	Spill Prevention Control and Countermeasures
SWAN	Simulating WAVes Nearshore
SWPPP	Stormwater Pollution Prevention Plan
SWQS	Surface Water Quality Standards
SWSA	South West Service Area
TMA	Transportation Management Association
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile Organic Compounds
VOR/DME	Very High Omnidirectional Range/Distance Measuring Equipment
WHA	Wildlife Hazard Area



Summary

Project Name and Location: Boston-Logan International Airport Runway Safety Area Improvements Project
Proponent: Massachusetts Port Authority (Massport)
EOEEA Number: 14442
Construction Date: 2011-2015
Estimated Construction Cost: Approximately \$75 million.

S.1 Introduction

The Massachusetts Port Authority (Massport) is proposing to enhance the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport (Logan Airport) (Figure S-1). The proposed improvements are required, to the extent feasible, to be consistent with the current Federal Aviation Administration's (FAA) airport design criteria for RSAs and to enhance rescue access in the event of an emergency. RSAs are safety improvements and do not extend runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways.

Project construction is anticipated to begin in July 2011, following the issuance of required permits. For the purposes of this Final Environmental Assessment/Environmental Impact Report, a three-season construction schedule is proposed that would account for environmental, operational and runway use restrictions and ensure that Massport meets the FAA's 2013 schedule for completing the Runway 33L safety improvements, and the 2015 deadline for both RSAs.

S.1.1 NEPA Overview

The FAA has determined that the proposed project, identified by Massport (the Sponsor) to meet FAA safety requirements, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). FAA has received and adopted this Final EA to identify alternatives to the Sponsor's proposed project and to document the potential environmental effects associated with the construction and operation of proposed safety improvements at Logan Airport. A Draft EA was circulated for public review on July 15, 2010 as a joint Draft Environmental Assessment/Environmental Impact Report, as described below. The FAA has prepared a draft Finding of No Significant Impact (Appendix 1) for the proposed project, based on its review of the comments on the Draft EA and the information provided in the Final EA/EIR.



Figure S-1 Location of Proposed Safety Improvements



S.1.2 MEPA History

In June 2009, Massport submitted an Environmental Notification Form (ENF) to the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), in accordance with the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations (301 CMR 11.00). The ENF explained the purpose of the project, which is to reduce the risk of injury to passengers and damage to aircraft in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA’s design criteria. This project purpose was adopted by the U.S. Army Corps of Engineers (USACE) as the basic project purpose for Section 404 of the Clean Water Act permitting.¹ The ENF was circulated to interested parties and a Public Notice of Environmental Review was published on July 8, 2009, in accordance with MEPA regulations 301 CMR 11.05 and 301 CMR 11.15. A public scoping meeting was held on July 30, 2009, to solicit public input on development of the Draft EA/EIR scope.

The Secretary of EEA issued a Certificate on the ENF on August 14, 2009, confirming the need to prepare an Environmental Impact Report (EIR) (see Appendix 1). The Certificate approved coordinated submission of required documentation under NEPA and stated that “the planning for this project would be best served by a

¹ Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.



coordinated review and the submission of a single set of documents to satisfy the requirements of both MEPA [Section 11.09(4)(c)] and NEPA.”

The Draft EA/EIR was filed with the MEPA Office on July 15, 2010. The Draft EA/EIR was in compliance with the MEPA regulations on the preparation and filing of an EIR at 301 CMR 11.07. The Draft EA/EIR was circulated to those who commented on the ENF and other interested parties. A Public Notice of Environmental Review was published in the Environmental Monitor on July 21, 2010, in accordance with MEPA regulations 301 CMR 11.05 and 301 CMR 11.15. The extended public comment period ended on September 3, 2010. The Secretary of EEA issued the Certificate on the Draft EA/EIR on September 29, 2010, confirming that the Draft EIR properly and adequately complied with the MEPA regulations, and a Final EIR must address the topics outlined in the Certificate (see Appendix 1). The Certificate further approved continuing the coordinated submission of required documentation under NEPA.

S.1.3 Public and Agency Coordination

In coordination with the FAA, Massport has sought public involvement throughout the scoping, planning, and analysis of the proposed Logan Airport RSA Improvements Project. Comments received during early coordination on environmental impacts of proposed actions have been considered and are addressed in Chapter 4, *Environmental Consequences*. Opportunity for public involvement was provided, as described below. Massport has also consulted directly with resource agencies and the affected community regarding potential impacts, minimization of these impacts, and mitigation strategies.

Massport presented the proposed RSA improvements and coordinated with two community groups well in advance of any regulatory filings and during the NEPA and MEPA process. The initial two public briefings were held on October 15, 2007, with the Orient Heights Civic Association and on October 24, 2007, with AIR, Inc., and a subsequent meeting was held on June 8, 2008, to brief City of Boston staff. The goal of these meetings was to acquaint the abutting communities with the overall safety project and solicit early input regarding potential neighborhood issues. On August 11, 2010, following publication of the Draft EA/EIR, Massport briefed the Town of Winthrop Conservation Commission on the submittal. Although no work is proposed in Winthrop, the briefing allowed the Commission and public in attendance to ask questions about the project. Massport is coordinating with the shellfish industry as well. A meeting was held on December 14, 2010, with the local shellfishing community to review the project and provide input on the mitigation strategy. Massport has continued to update neighborhood groups and local elected officials as the project planning and review has proceeded.

Massport began agency consultation and coordination, prior to the submittal of the ENF, by reaching out to numerous resource agencies to receive data and feedback regarding affected environmental resources and potential impacts. Briefings with the Boston Environment Department were also held in 2007, 2008, and 2009 as described in Chapter 7, *Public and Agency Involvement*. Letters were mailed to agencies in November 2007 requesting specific information such as: federally protected threatened and endangered wildlife, fishery or plant species; Priority Habitat and Estimated Habitat of Rare Wildlife locations; and historic or cultural resources. The results of this coordination are documented in Chapter 3, *Affected Environment*.



Massport established two interagency working groups to discuss avoidance and minimization of impacts to coastal wetland resources, and ultimately mitigation options, as conceptual design of the proposed Runway 33L and Runway 22R RSA improvements advanced. These Working Groups included local, state, and federal resource agency representatives, and met multiple times from April 2009 to January 2011 to provide advice and regulatory guidance to Massport regarding impacts and mitigation. Coordination with the Working Groups will continue through the permitting process.

Public comment on the Draft EA/EIR was sought through a Public Notice of Environmental Review on July 21, 2010. The EEA Secretary received eleven comment letters on the Draft EA/EIR, all but two from local, state, and federal agencies. Responses to public and agency comments on the Draft EA/EIR are provided in Appendix 2, *Response to Comments*.

To initiate public review under the state wetlands regulatory process, Massport filed a Notice of Intent (NOI) with the Boston Conservation Commission. A Notice of the Public Hearing regarding the NOI for the proposed Project, as required under the Massachusetts Wetlands Protection Act (MA WPA), was published in the Boston Herald and was posted in Boston City Hall on January 26, 2010. The NOI public hearing was held on February 3, 2010.

S.2 Purpose and Need

The purpose of the project is *to increase safety for aircraft and passengers in emergency situations, by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's design standards*. As noted above, this project purpose was adopted by the U.S. Army Corps of Engineers (USACE) as the basic project purpose for Section 404 of the Clean Water Act permitting.

RSAs reduce the risk of injury to persons and damage to aircraft should the aircraft undershoot, overshoot, or veer off the runway. RSAs also provide additional safety during less-than-ideal weather conditions, in the event that an aircraft overruns the existing runway during landing or an aborted take-off.

S.3 Project Description

As stated in FAA *Order 5100-38B*, "The highest aviation priority of the United States is the safe and secure operation of the airport and airway system." The FAA supports this policy by giving the highest priority to projects that enhance the safety and security of our national airport system. The *Department of Transportation Inspector General's 2009 Report to Congress On the Status of Runway Safety Areas at US Airports* listed Runway 33L at Logan Airport as one of the top eleven priority runway end safety enhancement projects in the United States.

The FAA requires airports to provide a safety area 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 RSA Improvements Project would



advance an overriding public interest: safety. Safety enhancements to the RSAs reduce the potential for injury to passengers, aircraft crew, and airport employees.

The FAA requires that airports that receive federal funding for airport improvement projects and commercial service airports, regulated under 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*, provide standard RSAs where feasible. The RSAs for Runway 33L and Runway 22R do not meet the FAA minimum dimensional standards for RSAs. 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. The Department of Transportation's Office of the Inspector General reported in 2009 that Logan Airport was one of the eleven of the nation's largest airports needing to improve RSAs. The report noted that "critical RSA improvements need to be made sooner rather than later to lower the risk of passenger injuries and aircraft damage in the event of runway accidents." To achieve this goal, FAA's current Airport Capital Improvement Program for Logan Airport has allocated funding, beginning in 2011, for the completion of construction of the Logan Airport 33L RSA project no later than 2013. The 22R RSA project must be completed by 2015.

The Logan Airport runways are generally aligned in three directions with runway ends pointing toward six compass headings. For safety, aircraft must generally take off and land into the wind, so the availability of specific runway configurations is determined by wind speed and direction, and other weather conditions. Logan Airport's multiple runway layout provides operating flexibility necessary to accommodate the airport's coastal location and highly variable wind conditions. Runway 4L-22R is primarily operated when wind conditions are northeasterly, when aircraft primarily arrive to Runway 4L, or southwesterly when aircraft primarily depart Runway 22R. Runway 15R-33L is operated when winds are northwesterly when aircraft either arrive or depart Runway 33L or southeasterly when aircraft arrive or depart Runway 15R. Runway 15R-33L is also Logan Airport's longest runway and is typically used by aircraft that require a long runway and is one of two key runways (the other being Runway 4R) requested by pilots when aircraft need to return to the airport due to emergency situations. Figures S-2 and S-3 show the existing runway ends.

Figure S-2 Existing Runway 33L End



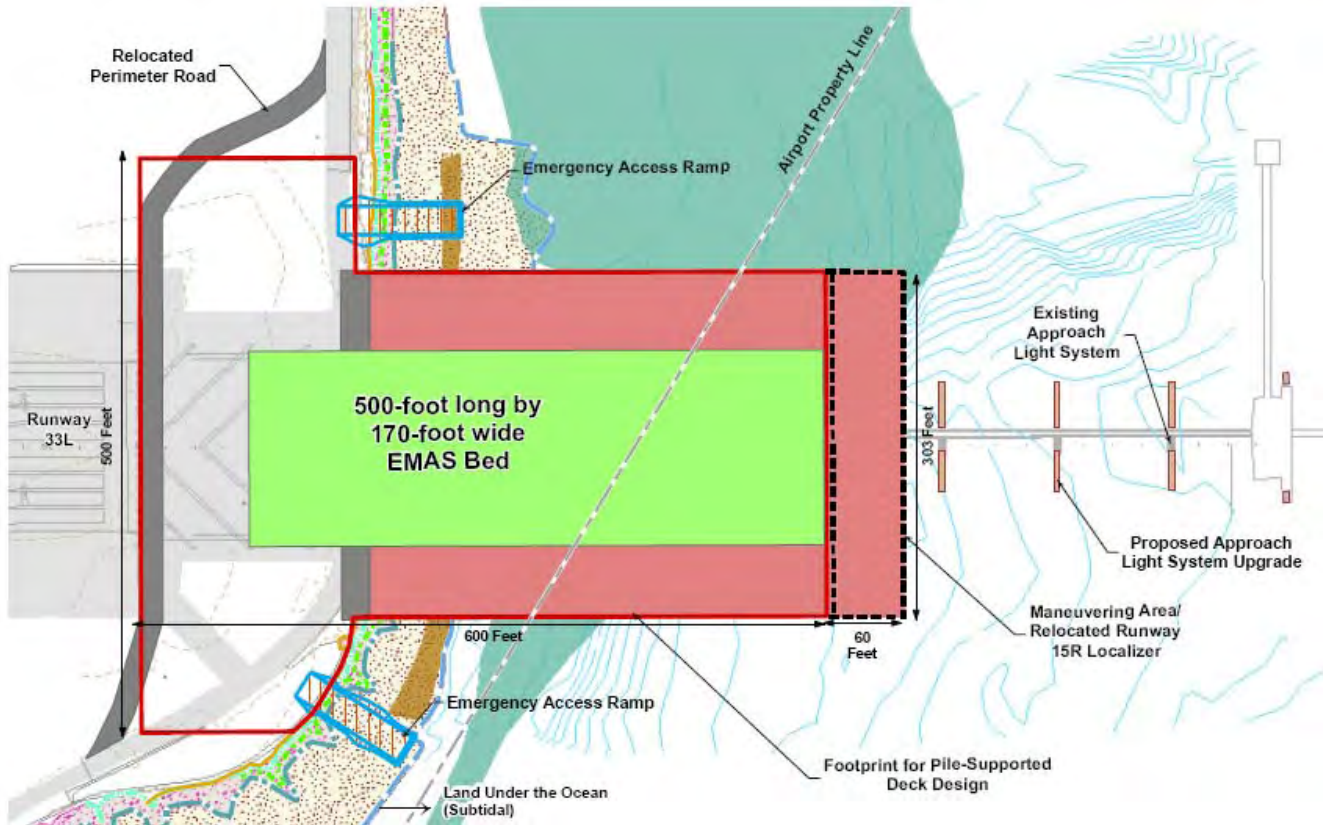
Figure S-3 Existing Runway 22R End



S.3.1 Runway 33L Runway Safety Area Improvements

The proposed Runway 33L RSA improvements include constructing a 600-foot long RSA with Engineered Materials Arresting System (EMAS)² portions of which would be on a 470-foot long by 303-foot wide pile-supported deck, as described in Chapter 2, *Alternatives* and shown in Figure S-4. The Proposed Action also includes moving the existing offset localizer to a section of the new pile-supported deck at the end of the RSA, and the physical aspects of installing the upgraded Category III Instrument Landing System (Cat III ILS) with a High-intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2). Part of the existing timber light pier (approximately 500 feet) would be removed and the approach lights would be incorporated into the new deck.

Figure S-4 Runway 33L Proposed Action



While the proposed Runway 33L RSA improvements would result in direct and indirect impacts to coastal wetland resources, including Coastal Bank, Coastal Beach, Land Under the Ocean, and Submerged Aquatic Vegetation (eelgrass), impacts from this alternative (the Proposed Action) are significantly less than that proposed for the three preliminary alternatives, as described in Chapter 2, *Alternatives*. The Proposed Action

² An EMAS bed is constructed of collapsible concrete blocks with predictable deceleration forces. When an aircraft rolls into an EMAS bed, the tires of the aircraft collapse the lightweight concrete, and the aircraft is slowed down to a safe stop in a way that minimizes damage to the aircraft.



would maintain, but not increase, runway utility and capacity, and would provide protection and functionality near equivalent to a RSA that fully meets the FAA design criteria.³ Massport and FAA retained this alternative based on the safety benefits achieved, a reduction of environmental impacts, and cost feasibility. The Secretary's Certificate on the Draft EA/EIR identified the Proposed Action as the preferred alternative.⁴

The proposed Runway 33L RSA improvements would extend the length of the existing RSA from 187.5 feet to a total of 600 feet. The new section of the RSA would have a width of 300 feet. Overall, the FAA determined that:

It is not practical for [the Runway 33L RSA] to meet full standards but it can be improved with a 600 [foot] by 300 [foot] runway safety area with 70 knot EMAS protection for Boeing 747-400, subject to environmental review and approvals. Reductions below 300 feet are unacceptable due to the need for a corridor on either side of the EMAS bed for emergency response and maintenance vehicles to safely maneuver and turn around without risk of driving off and over the water platform.⁵

The existing EMAS bed would be extended to a total length of 500 feet. As part of this alternative, the existing 20-foot wide airport perimeter road would be relocated between the runway's threshold and the EMAS bed (it is currently located at the end of the existing EMAS bed). Emergency access ramps to the water would be installed on the north and south sides of the RSA and a flotation device would be provided around the perimeter of the RSA. The localizer would be repositioned to the end of the RSA and installed within a 60-foot long and 303-foot wide section of the pile-supported deck.⁶ This section of deck is also required by FAA to facilitate the safe movement of rescue personnel and equipment at the seaward end of the deck in the event of an aircraft accident.

Massport considered various pile types and configurations for the Runway 33L RSA improvements, which were described in detail in the Draft EA/EIR. These alternate deck structures and piling combinations were evaluated at the conceptual design level to assess costs, minimize impacts, and evaluate constructability. Because the overall impacts of the different deck and piling configurations to coastal wetlands resources and coastal processes would be similar, all five options were retained to provide flexibility in the design/build process. The Secretary's Certificate on the Draft EA/EIR confirmed that retaining the five options for the Proposed Action will provide the flexibility and is not counter to the MEPA process.⁷ The five construction options are retained by Massport to maintain flexibility in the design/build process being undertaken for the Runway 33L safety improvements. The preferred alternative will be identified once the design/build contractor has been selected, and is likely to be a modification of one of these five construction options. Consistent with the requirement of the Secretary's Certificate on the Draft EA/EIR, Massport will continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree possible.

3 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston*, Massachusetts, January 30, 2009, p. 6. The FAA determined that a larger EMAS bed would be the functional equivalent of a standard 1,000-foot by 500-foot RSA.

4 EOE #14442, ENF Certificate, August 14, 2009, and Draft EIR Certificate, September 29, 2010.

5 *ibid.*

6 In addition to the 300-foot wide RSA, an 18-inch additional dimension is necessary along the sides of the deck to provide a curb and frangible barrier to prevent emergency vehicles and personnel from falling over the edge of the deck. These safety features can be accommodated within the existing deck length.

7 EOE #14442, ENF Certificate, August 14, 2009, and Draft EIR Certificate, September 29, 2010.



All five deck and pile options would contain the following elements:

- A RSA approximately 600 feet long by 300 feet wide located partially on land and partially on the proposed deck with various pile supporting options;
- A deck structure approximately 470 feet long (410 feet for the RSA plus 60 feet for emergency response/localizer) and 303 feet wide, with a surface area of approximately 142,410 square feet (3.27 acres);
- An EMAS bed approximately 500 feet long by 170 feet wide located within the RSA;
- Two 25-foot wide emergency access ramps located northeast and southwest of the proposed deck protected by riprap placed around the edge of the ramps;
- A steel sheet pile cutoff wall approximately 350 feet long at the inshore limit of the deck to prevent settlement and erosion of the backland areas;
- Finger pier extensions to the existing light pier to accommodate the CAT III ILS lighting upgrade; and
- Relocating the existing perimeter road, utilities, and constructing the Taxiway C1 Connector.

The five piling construction options considered for the Runway 33L RSA are summarized in Table S-1.

Table S-1 Runway 33L RSA Piling Construction Options

Option	Pile Type	Pile Size (inch diameter)	Pile Number	Batter Piles ¹	Bent Number ²	Bent Spacing (feet)	Deck Type
1	Pipe Pile	20	442	48	26	12	Cast in-place
2	Pipe Pile	20	182	48	7	70	Precast planks
3	Pipe Pile	20	155	48	5	100	Precast planks
5	Caisson	48	112	0	7	70	Precast planks
6	Caisson	48	80	0	5	100	Precast planks

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

² A pile bent is an array of piles driven in a row and fastened together at the top by a pile cap or bracing.

Note: Option 4 eliminated in the alternatives screening process presented in the Draft EA/EIR.

S.3.2 Runway 22R Inclined Safety Area Improvements

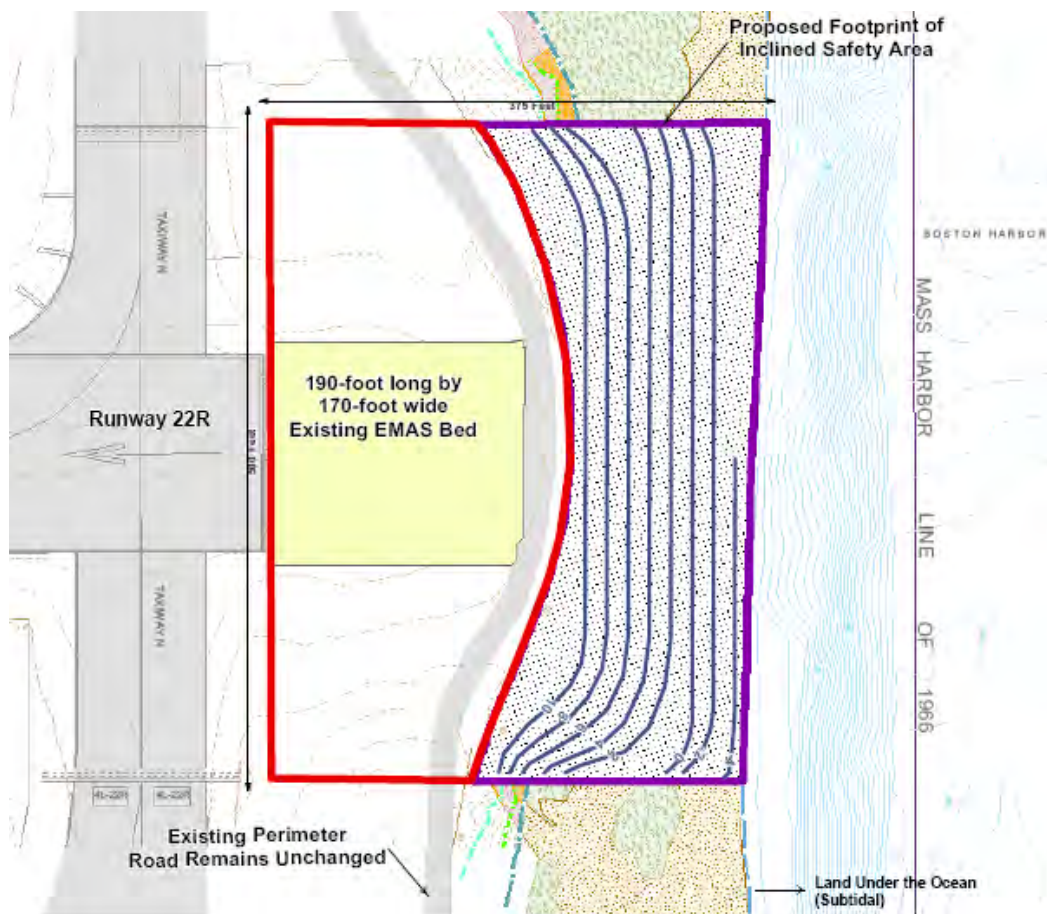
The proposed Runway 22R improvement enhance the existing RSA by constructing an inclined safety area (ISA), as described in Chapter 2, *Alternatives*. This alternative was advanced to the conceptual design phase because it would enhance the existing RSA and rescue access in the event of an emergency, at a construction cost which appears to be feasible while minimizing impacts to environmental resources. The Secretary’s Certificate on the Draft EA/EIR identified the Proposed Action as the preferred alternative.⁸

The proposed Runway 22R ISA would be similar to the ISA previously constructed at the Runway 22L end. It would require gravel fill to be placed approximately 130 feet north from the top of Coastal Bank and would be

⁸ EOE #14442, ENF Certificate, August 14, 2009, and Draft EIR Certificate, September 29, 2010.

graded over the full 500-foot width of the extended safety area down to the mean lower low water elevation.⁹ The proposed Runway 22R ISA would include placing approximately 8,700 cubic yards of fill, contained within a perimeter barrier of stone-filled gabions located below grade and surfaced with crushed stone. Emergency access ramps would not be required because the ISA itself would provide first responders with access between the water and the airfield. The perimeter road would not be relocated. Figure S-5 depicts the proposed Runway 22R ISA.

Figure S-5 Runway 22R Proposed Action



S.4 Environmental Impacts

The proposed RSA improvements Project will result in impacts to Salt Marsh, Land Containing Shellfish, Submerged Aquatic Vegetation (eelgrass), Coastal Bank, and Coastal Beach, as explained in Chapter 4,

⁹ Mean Lower Low Water (MLLW) = the average daily lower low water level of the tide at a location. Some locations have diurnal tides--one high tide and one low tide per day. At most locations, there are semidiurnal tides--the tide cycles through a high and low twice each day, with one of the two high tides being higher than the other and one of the two low tides being lower than the other.



Environmental Consequences. The Draft EA/EIR provided a detailed description of the environmental consequences.¹⁰

S.4.1 Resources Not Present/Not Affected

Several resource categories were not evaluated in the Draft EA/EIR due to either the absence of a resource within the Study Area or because the proposed RSA Improvements Project would not affect the resource category. Impact categories not present or affected by implementation of any alternatives were described Chapter 3, *Affected Environment*, of the Draft EA/EIR, and include:

- Air Quality;
- Compatible Land Use and Noise;
- Socioeconomic Impacts;
- Environmental Justice Populations;
- Department of Transportation Act, Section 4(f) Properties;
- Farmlands;
- Natural Resources, Energy Supply, and Sustainable Design; and
- Wild and Scenic Rivers.

S.4.2 Avoidance and Minimization

An extensive alternatives analysis was presented in the Draft EA/EIR and ENF, and is summarized in Chapter 2, *Alternatives*. The only alternative for either runway-end that would completely avoid impacts to environmental resources is the No-Action/No-Build Alternative. The No-Action/No-Build Alternative is not an acceptable alternative because it does not meet the requirements of the federal mandate to enhance the safety of RSAs at Logan Airport. The impacts described in this Final EA/EIR are the unavoidable impacts remaining after Massport and FAA has taken all reasonable steps to avoid and minimize effects of the safety project. Mitigation for unavoidable impacts is described below.

S.4.2.1 Avoidance

The alternatives analysis to select a recommended Runway 33L safety project was completed by Massport in coordination with FAA, as summarized in Chapter 2, *Alternatives*. The first screening level of the Runway 33L alternatives analysis determined whether an alternative should be carried forward to the second screening level based on the alternative's runway utility and capacity. Runway 15R-33L, the longest runway at Logan Airport, is essential to the airport's role as the long-haul gateway for New England. Any reduction in utility and capacity would have an adverse impact on Logan Airport operations, particularly during less-than-ideal weather conditions where Runway 15R-33L provides the runway length needed for safe aircraft operations. Alternatives that would fully avoid impacts to Boston Harbor were not acceptable because they would substantially reduce the runway's utility and capacity. Massport and FAA dismissed alternatives that would have:

- Reduced safety margins for other runways at Logan Airport;
- Increased penetrations to the Runway 15R approach surface and the Runway 33L departure surface;

¹⁰ The Draft EA/EIR is provided on the enclosed CD for reference.



- Increased impacts to adjacent East Boston neighborhoods, or;
- Greater impacts on the environment compared to the preferred alternatives for each runway-end.

Because of the proximity of the salt marsh to the existing runway end, the only Runway 22R RSA alternative that would avoid environmental resource impacts, without further reducing safety at Logan Airport, is the No-Action/No-Build Alternative. The No-Action/No-Build Alternative does not meet the project's purpose of *enhancing safety*.

S.4.2.2 Minimization

Massport and FAA have strived to minimize environmental impacts to the extent practicable. Massport and FAA will continue to work to minimize these impacts where possible as the design of the safety improvements and agency review progresses.

The Runway 33L alternatives analysis summarized in Chapter 2, *Alternatives*, incrementally reduced impacts to coastal wetland resources potentially resulting from the construction of a RSA. The alternatives analysis considered both the standard 1,000-foot long and 500-foot wide RSA and smaller RSA footprints utilizing EMAS, as well as both a solid fill and pile-supported structure. Massport and FAA selected a pile-supported deck with the smallest footprint that still provides the degree of safety consistent with the FAA guidelines. Potential wetlands impacts have been minimized by choosing the Proposed Action because it would:

- Utilize EMAS rather than a full 1,000-foot long RSA;
- Minimize the width of the RSA from 500 to 300 feet, consistent with FAA guidance for this location; and
- Include a deck and pile-supported structure, rather than a solid fill structure which would have significant direct and indirect impacts to coastal wetlands.

The Runway 22R alternatives analysis summarized in Chapter 2, *Alternatives*, incrementally reduced impacts to coastal wetland resources. The alternatives analysis considered both the standard 1,000-foot long and 500-foot wide RSA and smaller RSA footprints utilizing an expanded EMAS bed, as well as both a solid fill and pile-supported structure. Massport and FAA selected the inclined safety area that provides the degree of safety consistent with the FAA guidelines. Potential wetlands impacts have been minimized by choosing the Proposed Action because the inclined safety area has a smaller footprint than the larger RSAs and the solid fill or pile-supported structures or a smaller RSA allowed by expanding the EMAS bed. Further minimization is not feasible.

S.4.3 Runway 33L RSA Impacts

The proposed Runway 33L RSA improvements would affect coastal wetlands resources within an area of approximately 3.27 acres, as described in Chapter 4, *Environmental Consequences* and summarized below.

S.4.3.1 Wetlands

The proposed Runway 33L safety improvements would result in permanent impacts to state-regulated Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, and Land Under the Ocean. Federally regulated



Submerged Aquatic Vegetation (eelgrass) would be affected. A portion of this area is also defined as waters of the United States, and is subject to federal jurisdiction. There is a state-jurisdictional buffer zone extending 100 feet from the top of Coastal Bank. Work proposed within the buffer zone includes removing a segment of the existing perimeter road (which will be relocated outside of the buffer zone) and converting that area to grass. Work within the buffer zone also includes reconstructing the existing EMAS bed. The hydrological analysis described in Chapter 4, *Environmental Consequences*, demonstrates that the proposed pile-supported deck would not change coastal currents or wave impacts in the vicinity of the Runway 33L RSA.

Coastal Bank

Each of the proposed Runway 33L deck construction options would result in the unavoidable alteration of 315 linear feet of the man-made Coastal Bank, a state-regulated resource, to install the sheet piling and fill structure that would support the approach slab and landward end of the RSA deck. An additional 80 linear feet of the riprap slope would be altered for the emergency access ramps. This would convert the existing rip-rap bank to a sheet pile bank or stone ramps, and would not affect the functions or significant interests of the Coastal Bank including storm damage prevention and flood control. The new sheet pile bank would maintain the stability of the Coastal Bank.

Coastal Beach (Intertidal)

Each of the proposed Runway 33L construction options would result in the alteration of Coastal Beach (the intertidal beach), a state-regulated resource, ranging from 65 square feet (Option 3) to 250 square feet (Option 1), to install the fill structure that would support the approach slab and landward end of the RSA deck, and to install some of the deck pilings. An additional 4,320 square feet of Coastal Beach would be converted to two emergency access ramps.

Land Under the Ocean (Subtidal)

The proposed Runway 33L RSA improvements would affect the MA WPA interests significant to Land Under the Ocean, especially the protection of marine fisheries and wildlife habitat. Each of the construction options would result in the loss of Land Under the Ocean to install pilings needed to support the RSA deck (including the localizer). The area of loss is directly related to the size and number of pilings, and ranges from 395 square feet (Option 3) to 1,045 square feet (Option 5).

Eelgrass (submerged aquatic vegetation, Figure S-6) is a habitat type of the state-regulated Land Under the Ocean, and is also considered to be a Special Aquatic Site under the federal Section 404(b)(1) guidelines. The environmental analysis, as described in Chapter 4, *Environmental Consequences*, assumes that the entire portion of the eelgrass bed under the proposed Runway 33L deck would be shaded and would no longer receive sufficient light to survive. It is conservatively estimated that this would result in the loss or impairment of 60,100 square feet of eelgrass due to direct shading from the proposed deck (approximately 3 percent of the entire existing eelgrass bed), as this area would not receive enough light for eelgrass survival. An additional 6,500 square feet of eelgrass near the deck is expected to be indirectly affected by shading, although this is less certain. Each of the deck construction options would result in the same impacts to eelgrass, since the size of the RSA (and localizer) deck would be the same under all five construction options.

Figure S-6 Existing Eelgrass Beds and Light Pier at the Runway 33L End



Land Containing Shellfish (intertidal and subtidal)

Each of the proposed Runway 33L construction options would result in the alteration of Land Containing Shellfish (a state-regulated resource area that overlays Coastal Beach and Land Under the Ocean) as a result of placing pilings to construct the RSA improvements. Direct impacts, those associated with direct placement of pilings, range from 4,780 square feet (Option 3) to 5,495 square feet (Option 5) assuming that all of Coastal Beach and Land Under the Ocean supports shellfish. Distinct areas known to support shellfish, specifically blue mussels (*Mytilus edulis*), were delineated and the impacts calculated. Direct impacts to the blue mussel beds range from 14 square feet (Option 1) to 72 square feet (Option 2). Remaining mussel beds will be undisturbed.

S.4.3.2 Waterways and Tidelands

The proposed RSA improvements would have permanent impacts to waterways and tidelands protected under the Massachusetts Public Waterfront Act (Massachusetts General Law [M.G.L.] Chapter 91) as described below. Although the physical loss of tideland (based on the footprint of the area of natural substrate replaced by pilings) varies minimally among the proposed deck/piling options, the options would result in the same deck footprint. The affected Chapter 91 resources are therefore considered to be the area of the deck footprint seaward of the mean high tide line, approximately 142,410 square feet (3.27 acres) and extending approximately 470 feet seaward of the high tide line.

The waters adjacent to Logan Airport, extending 500 feet seaward of the mean high water line, are designated as the Logan Airport Security Zone under M.G.L. Chapter 90, Section 61. Although the proposed RSA improvements would involve work in Chapter 91 waterways and tidelands, there are no material impacts to the public's interests in these tideland areas as described in Chapter 6, *Regulatory Compliance*. The only public interests currently provided by the proposed RSA Project Sites are limited shellfishing, living marine resources, and water quality. Limited shellfishing will continue to be permitted within the Security Zone, subject to



Massport's oversight, in those areas that have historically supported that activity. The RSA Improvements Project is designed to protect, restore, and enhance living marine resources, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Water quality goals will continue to be attained, and improvements will result from upgrades to the existing airfield stormwater management system.

S.4.3.3 Fish, Wildlife and Plants

Boston Harbor is designated as Essential Fish Habitat (EFH) by the National Marine Fisheries Service (NMFS) for 18 species. A small amount of habitat that could be used by fish species (approximately 3.27 acres) would be altered by the proposed Runway 33L pilings and shaded by the deck. There are, however, native fish species that will benefit from the shaded zone and substrate created by the deck. The Massachusetts Division of Marine Fisheries (DMF) has recommended a time-of-year restriction for in-water, silt-producing work extending from February 15th through June 30th for the protection of winter flounder, one of the fish species for which Boston Harbor is designated as EFH. Winter flounder use near-shore areas for spawning, larval settlement, and juvenile development.¹¹ The safety improvements are not anticipated to have permanent impacts to fish habitat at the Runway 33L end. There are no permanent impacts to EFH. The NMFS concurs that all practicable alternatives to avoid and minimize impacts to the aquatic environment have been considered for Runway 33L.¹² NMFS recommends no in-water work occur between February 15th and June 30th to protect EFH in the project area. The mitigation plan for eelgrass, salt marsh, and intertidal mudflats, all resources used for spawning, foraging, and shelter, is described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

There are no anticipated permanent impacts to wildlife, as the loss of habitat is small. Wildlife can use similar habitat on Airport property or elsewhere in Boston Harbor. The Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP) indicated that, with respect to the work proposed under the MA WPA, the proposed Project would not adversely affect the actual resource area habitat for upland sandpiper, a state-protected species, and that the proposed Runway 33L and Runway 22R safety improvements would not result in a "take" of state-listed rare species.¹³ The proposed Runway 33L RSA improvements would replace a portion of Coastal Beach/Tidal Flat, eliminating habitat for certain benthic organisms, but the pilings could provide attachment substrate for other benthic organisms. Impacts to plants would include the loss of habitat (coastal beach and land under the ocean) for marine algae and eelgrass. This is a negligible loss of habitat that would not impact the local populations of these species in Boston Harbor.

S.4.3.4 Federally Listed Threatened and Endangered Species

There would be no impacts to federally listed species. The U.S. Fish and Wildlife Service (USFWS) indicated that there are no federally listed threatened or endangered species under their jurisdiction within the Project area.¹⁴ NMFS has indicated that sea turtles, protected under the Endangered Species Act (ESA) may occur within Boston Harbor and requested that the FAA undertake an ESA Section 7 Consultation.¹⁵ The FAA made a

11 Comment Letter on the ENF received from the Massachusetts Division of Marine Fisheries, dated August 7, 2009.

12 Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated September 2, 2010.

13 Letter received from the Massachusetts Natural Heritage and Endangered Species Program dated March 26, 2010. NHESP's letter does not address the potential impacts of Taxiway C1 Connector. Massport will clarify this issue with NHESP. If an impact to endangered species habitat is identified by NHESP, Massport will work with NHESP to address that impact.

14 Letter received from the United States Fish and Wildlife Service, New England Field Office, dated December 19, 2007.

15 Letter received from the National Marine Fisheries Service, dated March 24, 2010.



preliminary determination that the proposed pile-supported deck is not likely to adversely affect any threatened or endangered species listed under the jurisdiction of NMFS.^{16, 17} NMFS concurred with the FAA's determination, and indicated that the ESA Section 7 Consultation is complete.¹⁸

S.4.3.5 Water Quality

The proposed Runway 33L safety improvements would not generate pollutants or affect water quality. As described in Chapter 3, *Affected Environment*, the existing and proposed EMAS bed could not be accessed by vehicles other than during an emergency, due to its composition and there is need for periodic access to maintain the existing navigational aids. Runways, taxiways, and aprons are not sources of pollutants. 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 site further reduces the quantity of sediments that are available for transport by stormwater runoff.

All outfalls are regulated under Logan Airport's existing National Pollutant Discharge Elimination System (NPDES) permit, as described in Chapter 3, *Affected Environment*. Stormwater sampling of the airfield outfalls is an ongoing requirement of the NPDES permit and would continue following the construction of the Runway 33L RSA improvements. Stone rip rap at these outfalls prevents erosion and sedimentation resulting from stormwater discharges. Runoff from the perimeter roadway and portions of the existing Runway 33L RSA do not enter the closed drainage system and sheet flow across the rip rap slope into Boston Harbor. Overland sheet flow from the RSA and adjacent areas are not regulated discharges under the NPDES permit.

All of the proposed Runway 33L deck construction options would have the same water quality impacts. The differences among the piling configurations, which are unique to each option, would have negligible impact on water quality. The five construction options would have the same drainage system and potential effects on stormwater in the vicinity of Runway 33L. Stormwater runoff from the deck will be discharged via scuppers located beneath the deck at several locations to prevent erosive forces from disturbing sediment and impacting the receiving water. The proposed stormwater management system complies with the Massachusetts Stormwater Management Regulations to the extent practicable, as discussed in Chapter 6, *Regulatory Compliance*.

S.4.3.6 Historical, Archaeological, and Cultural Resources

As documented in Chapter 3, *Affected Environment*, there are no historic resources directly adjacent to the proposed Runway 33L RSA. The Proposed Action would not affect any known historic or archaeological resources. The Massachusetts Board of Underwater Archaeological Resources (MBUAR) does not have any record of underwater archaeological resources in the project area and it is highly unlikely that such a resource would be found during construction due to the type of construction and project location – all on a previously filled area. The MBUAR has concurred with this finding.¹⁹

¹⁶ Letter to National Marine Fisheries Service from the Federal Aviation Administration, dated March 22, 2010.

¹⁷ Vanasse Hangen Brustlin, Inc. Assessment of Sea Turtles and Whale Presence within the Boston Harbor Technical Memorandum, dated February 12, 2010.

¹⁸ Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated July 26, 2010.

¹⁹ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Board of Underwater Archaeological Resources, dated August 25, 2010.



S.4.3.6 Light Emissions and Visual Impacts

The proposed Runway 33L improvements would have no significant impacts to light emissions or visual setting. The existing Medium Intensity Approach Lighting System with Runway Alignment (MALSR) lighting system would be upgraded to a CAT III ILS ALSF-2, which would add lights to the piers immediately adjacent to the end of the RSA pier. These lights would be at the same elevation as the existing lights, and would be distant (approximately 3,000 feet) from any residential receptors within the Point Shirley neighborhood of Winthrop. The proposed Runway 33L RSA improvements would have a negligible change on the view of Logan Airport from the nearest neighborhood of Point Shirley and Deer Island. As noted in Chapter 3, *Affected Environment*, the existing view is a low-profile shoreline, the coastal bank, and the existing 2,400-foot timber light pier. The proposed RSA improvements would be viewed from a distance and, because of the low profile, would blend in with the existing shoreline and would appear similar to the existing light pier.

S.4.3.7 Construction Period Impacts

Although there are no permanent construction-period impacts, construction activities may have temporary effects on water quality from sedimentation; traffic and the transportation network in the vicinity of Logan Airport; noise that would affect area residents; and emission of air pollutants during the construction period. This section summarizes the potential effects of construction activities. Chapter 4, *Environmental Consequences*, of the Draft EA/EIR described the construction period impacts.

Temporary disturbances to water quality would occur during construction of the Runway 33R RSA improvements. Construction is likely to disturb benthic sediments in the water column and increase turbidity in the vicinity of operations. Runway 33L deck construction Options 5 and 6 are expected to generate excavated sediment and use drilling fluid during drilling of caissons. Drilling fluid, likely composed of a bentonite slurry or a polymer fluid, would be displaced up and out of the steel casing as the concrete is pumped in.

Barges would transport most of the required construction equipment, personnel, and materials, avoiding impacts on the area roadway system. The only materials expected to be delivered by truck to the airport would be the EMAS blocks, concrete, and asphalt. Massport's agreement with the Contractor will specify that direct construction truck traffic access to the Runway 33L construction site be primarily through the North Gate for the duration of construction. For the purposes of the Draft EA/EIR, use of the North Gate only was analyzed, as the South Gate is not operational at all times. The use of the North Gate is restricted by vehicle and load size and length. The projected daily need for these types of heavy and light trucks were used to estimate the daily number of truck arrivals and total truck trips (arrivals plus departures) to the airport as presented in the Draft EA/EIR. The proposed Runway 33L RSA improvements construction would generate approximately 18 to 56 total truck trips per weekday. The Runway 33L RSA improvements construction would have minimal impact on airport roadways, based on the maximum of 20 total construction truck trips in the peak hour periods and access restrictions and infrastructure improvements. The airport roadway infrastructure accommodates over 119,000 daily trips each weekday and can accommodate the anticipated minimum of 56 additional construction truck trips associated with the proposed Runway 33L RSA improvements construction without causing capacity or delay problems. Vehicular traffic flow on the airport roadway network during construction would be managed to prevent the quality of traffic flow from deteriorating to unacceptable levels of service. If necessary, Massport has the ability to modify contractor schedules and access routes to minimize impacts.



The proposed construction of the Runway 33L RSA is expected to generate short-term construction-related air 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 the generation of fugitive dust from disturbance of unpaved areas. However, these impacts would be *de minimis* and comply with the General Conformity Rule of the federal Clean Air Act.

The construction of the proposed Runway 33L RSA improvements would generate noise associated with construction activities. Construction equipment is expected to be used only during daytime hours (7 AM to 7 PM on weekdays and 9 AM to 6 PM on weekends) consistently throughout the Project's construction phase to install the pile-supported deck. The L_{10} (day-night average)²⁰ sound levels at all receptors would be below the City of Boston's residential criterion of 75 dBA (sound pressure level measured on a logarithmic scale in units of decibels).²¹ Sound levels from construction would be similar for all of the construction options, and would not result in significant noise impacts at any off-airport location.

S.4.4 Runway 22R Inclined Safety Area (ISA) Impacts

The proposed Runway 22R safety improvements would affect coastal wetlands resources in an area of approximately 1.4 acres, as described in Chapter 4, *Environmental Consequences* and summarized below.

S.4.4.1 Wetlands

The proposed Runway 22R ISA improvements would result in permanent impacts to state-regulated Coastal Bank, Salt Marsh, Coastal Beach, Land Containing Shellfish, and Land Under the Ocean. A portion of this area is also defined as waters of the United States, and is subject to federal jurisdiction. There is a state-jurisdictional buffer zone extending 100 feet from the top of Coastal Bank. There are no permanent impacts to this buffer zone, which contains the perimeter road and a portion of the existing Runway 22R EMAS bed. The ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation.

Coastal Bank

The proposed Runway 22R ISA improvements would result in the unavoidable alteration of 530 linear feet of Coastal Bank in order to construct the ISA. However, the proposed Runway 22R ISA would not affect the interests protected by the MA WPA that are significant to Coastal Bank, as it is not significant to storm damage prevention or flood control because it does not supply sediment to coastal beaches, coastal dunes or barrier beaches. The proposed ISA would maintain or improve the stability of the bank.

Coastal Beach (Intertidal Mud Flats)

Approximately 26,630 square feet of Coastal Beach/Tidal Flat would be lost due to the construction of the Runway 22R ISA. However, the proposed Runway 22R ISA would not affect the interests significant to Coastal Beach and Land Under the Ocean. It is not likely to impact any adjacent or downdrift Coastal Beach and will not interfere with littoral drift.

²⁰ A-weighted sound level which is exceeded for 10 percent of the time during the time period. During a 10- minute period, the L_{10} would be the sound level which was exceeded by other sound levels for 10 minutes.

²¹ For community noise impact assessment, sound level frequency characteristics are based upon human hearing, using an A-weighted (dBA) frequency filter. The A-weighted filter is used because it approximates the way humans hear sound.



Salt Marsh

Approximately 35,040 square feet of Salt Marsh (including 7,110 square feet of *Phragmites*-dominated Salt Marsh) would be lost due to the construction of the Runway 22R ISA (Figure S-7). The proposed Runway 22R ISA would impact the interests significant to Salt Marsh, and therefore, requires a MA WPA Variance because work would not meet the regulatory performance standards described in the MA WPA. Chapter 6, *Regulatory Compliance*, describes the proposed Runway 22R ISA's consistency with the MA WPA Variance requirements.

Figure S-7 Existing Salt Marsh at the Runway 22R End



Land Under the Ocean (Subtidal)

Approximately 700 square feet of Land Under the Ocean would be affected by the placement of fill required to construct the inclined safety area. There are no eelgrass beds located within the proposed Runway 22R ISA improvements area. The proposed Runway 22R RSA improvements would have no adverse effects on marine fisheries and wildlife habitat protected by Land Under the Ocean, as high densities of polychaetes, mollusks, or macrophytic algae are not present in the vicinity of Runway 22R. Several of these species would be able to colonize the cobble surface of the ISA.

Land Containing Shellfish (Intertidal and Subtidal)

Approximately 62,370 square feet of Land Containing Shellfish (this area overlays the state-regulated wetland resource areas of Coastal Beach, Salt Marsh, and Land Under the Ocean) would be lost due to the placement of fill required to construct the inclined safety area. The proposed Runway 22R ISA would affect the interests significant to Land Containing Shellfish mapped by the DMF as a conditionally restricted designated shellfish growing area. The proposed project will not introduce any pollutants to the marine environment that would affect water quality in the vicinity of Runway 22R.



S.4.4.2 Waterways and Tidelands

The proposed Runway 22R ISA improvements would have permanent impacts to waterways and tidelands. An area of approximately 1.4 acres below the mean high water line would be affected due to the construction of the ISA. State law prohibits public access within the proposed Project area. Limited shellfish harvesting by licensed shellfishers is allowed within the Security Zone with prior notice from DMF.

Although the proposed RSA improvements would impact Chapter 91 waterways and tidelands, there are no significant impacts to the public's interests in these tideland areas. The only public interests currently provided by the proposed RSA Project Site are limited shellfishing, living marine resources, and water quality. The Project is designed to protect, restore, and enhance living marine resources, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

S.4.4.3 Fish, Wildlife and Plants

The proposed Runway 22R ISA would replace a portion of the Coastal Beach (intertidal mud flats) present at Runway 22R with a stone substrate, as described in Chapter 3, *Affected Environment*. This would alter habitat for benthic organisms. The small amount of habitat lost due to the proposed ISA is minor, and there is available habitat elsewhere on Airport property and throughout Boston Harbor. There would be limited impacts to shellfishermen resulting from the proposed project, as the population of harvestable soft shell clams is small and the resulting impacts to shellfish harvesting would be minimal. A small amount of intertidal habitat that could be used by fish species (approximately 1.4 acres, including salt marsh and coastal beach) would be altered.

The proposed Runway 22R ISA would require the removal (and relocation) of salt marsh grasses present at the end of Runway 22R, and the replacement with gravel fill. A stand of invasive common reed (*Phragmites australis*) at the Runway 22R end would also be removed. The vegetation does not provide important wildlife value, although starlings and red-winged blackbirds have been observed in this area. The removal of common reed and salt marsh vegetation eliminate areas of potential wildlife hazards within the FAA-designated Wildlife Hazard Area, as these are potential roosting sites for starlings and red-winged blackbirds, and potential habitat for shorebirds, brant, and seagulls.

S.4.4.4 Federally Listed Threatened and Endangered Species

The proposed Runway 22R ISA would result in the loss of approximately 1.4 acres of intertidal habitat and 700 square feet of subtidal habitat that could potentially be used by sea turtles. Although sea turtles have never been reported in Boston Harbor, NMFS considers that sea turtles may be found seasonally in Boston Harbor. NMFS requested that the FAA undertake an ESA Section 7 Consultation.²² The FAA made a preliminary determination that the proposed pile-supported deck is not likely to adversely affect any threatened or

²² Letter received from the National Marine Fisheries Service, dated March 24, 2010.



endangered species listed under the jurisdiction of NMFS.^{23, 24} NMFS concurred with the FAA's determination, and indicated that the ESA Section 7 Consultation is complete.²⁵

S.4.4.5 Water Quality

The proposed Runway 22R ISA would have no permanent impacts to water quality. No vehicles would operate on the proposed ISA, no new impervious surfaces and no new stormwater conveyance systems would be created, and the proposed ISA would not result in any new discharge of untreated stormwater. There would be no change to the quality and quantity of stormwater runoff resulting because the proposed ISA is not an area with higher pollutant loading and would not generate permanent changes in total suspended solids (TSS). The proposed project would be in compliance with the Massachusetts Stormwater Management regulations to the extent practicable and the existing NPDES permit as explained in Chapter 6, *Regulatory Compliance*.

S.4.4.6 Historical, Archaeological, and Cultural Resources

There are no anticipated impacts to historical, archaeological, or cultural resources as a result of the Proposed Action. There would be no change to the Runway 22R end that may cause an adverse effect to any known historical, archaeological, or other cultural resources. The Massachusetts Board of Underwater Archaeological Resources does not have record of underwater archaeological resources in the project area and it is highly unlikely that a resource would be found because the Runway 22R ISA is located almost entirely landward of mean low water. The Board concurred with this finding.²⁶

S.4.4.7 Light Emissions and Visual Impacts

There would be no changes to the lighting system at Runway 22R. The ISA would have a negligible change on the view of Runway 22R from the East Boston neighborhood of Orient Heights, particularly along Bayswater Street, and from Constitution Beach, a public beach also in Orient Heights. As noted in Chapter 3, *Affected Environment*, the existing view from both Bayswater Street and Constitution Beach is a low-profile shoreline, salt marsh vegetation, and the coastal bank.

S.4.4.8 Construction Period Impacts

Construction activities may have a temporary effect on water quality from sedimentation, traffic and the transportation network in the vicinity of Logan Airport, noise that would affect area residents, and the emission of air pollutants. This section summarizes the potential effects of construction activities. Chapter 4, *Environmental Consequences*, of the Draft EA/EIR described the construction period impacts.

Water quality in the vicinity of the proposed Runway 22R ISA improvements could be temporarily affected by short-term construction activities, particularly due to the excavation and dredging required to remove unsuitable substrate materials and to place new stone fill. The work would consist of the excavation and removal of soft organic soils in the intertidal and coastal bank areas and replacement with crushed

²³ Letter to National Marine Fisheries Service from the Federal Aviation Administration, dated March 22, 2010.

²⁴ Vanasse Hangen Brustlin, Inc. Assessment of Sea Turtles and Whale Presence within the Boston Harbor Technical Memorandum, dated February 12, 2010.

²⁵ Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated July 26, 2010.

²⁶ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Board of Underwater Archaeological Resources, dated August 25, 2010.



stone/granular soil to provide a stable base for the slope. The perimeter of the inclined safety area would be protected from erosion by the placement of gabions (partitioned, wire fabric containers filled with stone to form flexible, permeable structures for earth retention). Excavation of material within the intertidal zone would be completed during periods of low tide. The area would be surrounded by a siltation curtain/ debris boom to contain and minimize any debris or siltation. Construction completed at the Runway 22R end would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts. The gabions wrapped with filter fabric installed during construction would also act as a barrier to sediment releases and reduce resulting turbidity.

Unlike Runway 33L, construction of the proposed Runway 22R ISA would be primarily undertaken from the landside, as most of the materials and workers would arrive by truck. The majority of workers would be transported to the site by shuttle bus. The Contractor for the proposed Runway 22R ISA would be under the same access restrictions for direct construction truck traffic access as the Runway 33L construction. Vehicular traffic flow on the airport roadway network during construction would be managed so that the quality of traffic flow would not deteriorate to unacceptable levels of service. If necessary, Massport has the ability to modify contractor schedules and access routes to minimize impacts.

The proposed construction of the Runway 22R ISA is expected to generate short-term construction-related air emissions, including exhaust emissions from on-road construction vehicles, off-road construction equipment and marine transport vessels, and the generation of fugitive dust from disturbance of unpaved areas. However, these impacts would be *de minimis* and comply with the General Conformity Rule of the federal Clean Air Act.

The construction of the proposed Runway 22R ISA improvements would generate noise associated with construction activities. Construction equipment is expected to be used only during daytime hours (7 AM to 7 PM) consistently throughout the Project's construction phase. Construction noise would be below the City of Boston's residential impact criteria at all locations.

S.5 Mitigation Measures

The proposed RSA Improvements Project would result in unavoidable impacts to Salt Marsh, Eelgrass (Submerged Aquatic Vegetation), and Land Containing Shellfish. Massport has committed to providing compensatory mitigation, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings* and listed in Table S-2. The proposed safety improvements would not affect the functions or significant interests of Coastal Bank, including storm damage prevention and flood control. Temporary impacts to environmental resources during construction would be mitigated through emissions and noise controls, as well as soil and erosion controls to prevent adverse water quality impacts.



Table S -2 Proposed Massport Project Mitigation Commitments

Environmental Categories	Proposed Mitigation Measure	Approximate Total Cost	Implementation Schedule
Eelgrass	Restore 4.6 acres of eelgrass at two locations by transplanting eelgrass from the Runway 33L RSA area.	\$600,00 to \$1.2 million	Initiate Prior to Construction
	Monitor eelgrass restoration areas for a 5-year period and implement corrective actions if required.	\$125,000	Post-construction
Land Containing Shellfish	Restore 1.1 acres of intertidal clam flats within the salt marsh mitigation site.	TBD	During construction
	Monitor blue mussel population at the Runway 33L RSA area. Implement corrective actions if required.	\$25,000	Post-construction
	Provide funding for shellfish enhancements in Boston Harbor	TBD	During construction
Salt Marsh	Restore 2.83 acres of salt marsh within the Rumney Marsh ACEC.	\$600,000 to \$1.1 million	During Construction
	Monitor compensatory Salt Marsh for success and invasive plant species, and implement an invasive species control plan.	\$125,000 (\$25,000 per year)	5-year period following construction

TBD To be determined

Massport developed separate salt marsh and eelgrass mitigation processes, in consultation with the Salt Marsh and Eelgrass Working Groups. The Salt Marsh Working Group comprises representatives of the following agencies: FAA, USACE, U.S. Environmental Protection Agency (USEPA), MA Office of Coastal Zone Management (CZM), DEP, Massachusetts Department of Conservation and Recreation (DCR), Massachusetts Department of Fish and Game Division of Ecological Restoration (DER, formerly CZM WRP), and Boston Environment Department. The Eelgrass Working Group includes representatives from the FAA, USACE, USEPA, CZM, DEP, DCR, DER and DMF, and the Boston Environment Department. In response to overlapping interests in the mitigation strategies, the two Working Groups were merged into a single larger group which provided input on all resource mitigation strategies.

Proposed mitigation measures for permanent impacts to Salt Marsh, Submerged Aquatic Vegetation, Land Containing Shellfish, and Water Quality (Stormwater) are summarized in the following sections.

S.5.1 Salt Marsh and Mud Flats

Mitigation for the unavoidable loss of salt marsh and mud flats at Runway 22R would be provided by restoring offsite, historically altered salt marsh in the vicinity of Boston Harbor.

DEP has stated that a 2:1 replacement/creation ratio would be required as part of the MA WPA variance. The USACE would require the same mitigation ratio. DEP typically seeks strict replication by requiring mitigation sites to be on-site or adjacent to the affected site, in the same watershed, and in-kind with the same elevation, habitat type, hydrological connection, ecological functions, and other key characteristics. Higher ratios tend to be required for restoration, enhancement, or preservation. Therefore, based on current guidance, a 2:1 mitigation goal is proposed for salt marsh and a 1:1 mitigation goal for mud flats, which would total



approximately 123,340 square feet (2.83 acres), as restoration or creation. The total mitigation goal is twice the combined area of affected salt marsh and intertidal beach (mud flats). The Salt Marsh Mitigation Working group reviewed and concurred with this mitigation ratio.

In February 2010, Massport conducted a GIS analysis and aerial photo interpretation to identify potential mitigation sites within the study area. The study area includes most of the area within the Boston Harbor and other areas depicted in the Salt Marsh Mitigation Study Area. The preliminary site selection criteria, described in Chapter 5, *Proposed Mitigation and Section 61 Findings*, helped select potential sites and exclude sites that would not fit the mitigation requirements.

A total of forty potential sites were initially identified. Of the forty sites identified, ten sites were advanced to field reconnaissance, and Massport recommends that five sites be advanced for further evaluation. The site evaluation included field reconnaissance, used objective evaluation criteria, and other input from agencies. This site selection process was described in detail in the Draft EA/EIR.

The site identification criteria considered FAA's requirements for wildlife hazards. FAA Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* (August 28, 2007) provides standards, practices, and recommendations to assist airports to comply with the wildlife hazard management requirements of Title 14 CFR Part 139, *Certification of Airports*. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), Wildlife Services, the entity responsible for determining whether a mitigation area would constitute a wildlife hazard, has reviewed the proposed salt marsh mitigation and concurred that these areas do not create or exacerbate a wildlife hazard.

Based upon input from the interagency working group, Massport will create new salt marsh and mud flat in Rumney Marsh, in Saugus, Massachusetts, at a 2:1 mitigation ratio. A conceptual salt marsh restoration plan for the Rumney Marsh restoration site is described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. This plan was developed based on DEP²⁷ and USACE²⁸ mitigation guidance and guidance provided by the resource agencies during their review of the proposed site.

S.5.2 Eelgrass

Mitigation for the unavoidable loss of eelgrass at Runway 33L would be provided by restoring eelgrass beds within Boston Harbor. In consultation with the Eelgrass Working Group, Massport has identified two locations for eelgrass restoration: White Head Flats in Hull, and New Harbor in Boston. These sites were identified through a comprehensive site selection process that used information from previous studies of eelgrass habitat in Boston Harbor, updated site selection parameters, and field investigation of potentially suitable sites. Prior to the start of construction of the Runway 33L RSA deck, Massport will transplant eelgrass from the Runway 33L impact area to the restoration sites, for a total restored area of 4.6 acres (a 3:1 restoration ratio). These sites will

27 Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Wetlands and Waterways Program: Massachusetts Inland Wetland Replication Guidelines, March 2002.

28 U.S. Army Corps of Engineers, Addendum to New England District Compensatory Mitigation Guidance: Compensation for Impacted Aquatic Resource Functions, File No. NAE-2006-3648, December 18, 2007.



be monitored monthly during the first growing season, and annually for a period of five years. If restoration does not meet the success criteria established by the resource agencies.

S.5.3 Land Containing Shellfish

Shellfish mitigation for the RSA Improvements Project will consist of three elements. The loss of the intertidal clam flats will be mitigated by restoring a historically-filled intertidal area in the Rumney Marsh ACEC, as part of the salt marsh mitigation site. Approximately 0.7 acres of intertidal flats would be restored at this location. Massport will monitor the existing blue mussel beds under the Runway 33L deck, and monitor the new pilings, to verify the assumption that the new deck and pilings would enhance mussel habitat and provide additional substrate for mussel colonization. Prior to any work at the Runway 22R ISA, Massport will coordinate with the DMF and authorized shellfishers (through the Master Digger) and allow DMF to remove all harvestable-size soft-shell clams within the area of the ISA. All small clams may also be removed at the discretion of DMF and transplanted to a suitable location to augment existing soft-shell clam resources.

Massport will provide a net benefit to the local population of shellfish by contributing funding to the DMF Boston Harbor Soft Shell Clam stock enhancement program, consistent with the FAA and USDA Wildlife Hazard Avoidance Guidelines. Massport will execute a Memorandum of Agreement with DMF similar to the MOA (July 7, 2007) for the Runway 22L ISA project.

S.5.4 Construction-Period Mitigation Commitments

Temporary, short-term impacts from construction activities would be mitigated to the extent practicable, as listed in Table S-3. 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 150/5370-10 (latest edition), Standards for Specifying Construction of Airports*.²⁹ 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 Project and would be reviewed by the appropriate regulatory agencies as part of the permit applications. In order to mitigate for any unintended consequences to historic or archeological resources during construction, an Unanticipated Discovery Plan would be developed by Massport and implemented during construction.

²⁹ Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports.



Table S-3 Proposed Construction Mitigation Commitments

Environmental Categories	Proposed Construction Mitigation Measure
Eelgrass	<p>Implement erosion and sedimentation control measures according to the Soil Erosion and Sediment Control Plan.</p> <p>Restrict barge movement to and from the work area to designated construction corridors outside of the eelgrass bed, where feasible.</p> <p>Overnight storage of barges outside of any eelgrass beds</p> <p>Massport will conduct post-construction monitoring and will restore any additional areas of eelgrass beds that are inadvertently damaged by construction barges or equipment.</p>
Water Quality	<p>Develop and implement a comprehensive Soil Erosion and Sediment Control Plan in accordance with NPDES and DEP standards.</p> <p>Apply water to dry exposed soil to prevent dust production.</p> <p>Stabilize any highly erosive soils with erosion control blankets and other stabilization methods, as necessary.</p> <p>Use sediment control methods (such as silt fences and hay bales), during excavation to prevent silt and sediment entering the stormwater system and waterways.</p> <p>Maintain construction equipment to prevent oil and fuel leaks.</p> <p>Silt curtains/semi-permanent (overnight) debris booms and secondary boom use around the barge for additional containment, and silt fencing.</p> <p>Collect and pump slurry and/or silty water to a containment area on the barge and the placement of sediment on sheets of plastic film to contain runoff (Construction options 5 and 6 only).</p>
Salt Marsh	<p>Implement erosion and sedimentation control measures according to the Soil Erosion and Sediment Control Plan.</p>
Noise	<p>Maintain mufflers on construction equipment.</p> <p>Keep truck idling to a minimum.</p> <p>Fit air-powered equipment with pneumatic exhaust silencers.</p> <p>Do not allow nighttime construction.</p> <p>Implement pile-driving measures to reduce noise impacts to fish</p>
Traffic	<p>Limit construction traffic to federal or state highways, restricting use of East Boston roadways by construction vehicles.</p> <p>Implement construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and contractors to join the Logan TMA.</p>
Air Quality	<p>Keep truck idling to a minimum.</p> <p>Retrofit appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters.</p> <p>Implement construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan Transportation Management Association (TMA).</p>
Cultural Resources	<p>Develop an Unanticipated Discovery Plan in accordance with the Board of Underwater Archaeological Resources' Policy Guidance.</p>
Hazardous Materials and Solid Waste	<p>Pre-characterize any materials that would be dredged or excavated from the Project areas to determine course of action for removal.</p>



S.5.4.1 Water Quality

Spill prevention measures would be deployed throughout the construction phase to prevent pollution from construction equipment and erosion, as well as sedimentation controls during construction phases. The following spill prevention measures would be deployed throughout the Runway 33L improvements construction phase in order to prevent pollution from construction equipment or material:

- Installing protective measures, such as silt curtains/semi-permanent (overnight) debris booms, particularly around pile bents, secondary boom use around the excavation barge for additional containment, and silt fencing to prevent sediment from impacting water quality;
- Collecting and pumping slurry and/or silty water to a containment area on the barge and the placement of sediment on sheets of plastic film to contain runoff; and
- Managing contaminated materials encountered during construction according to the Massachusetts Contingency Plan (310 CMR 40.00) and M.G.L. 21E, Oil and Hazardous Materials Release Prevention and Response Act.

Erosion and sedimentation controls would be used during the Runway 33L upland earthwork and construction phases as described below. Proposed controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with USEPA NPDES regulations and with Massport's contractor requirements.

- Perimeter sediment controls, consisting of staked hay bales and silt fencing or compost-filled "silt socks" would be placed around upland work areas to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site.
- Existing catch basins would be protected with hay bale barriers (where appropriate) or silt sacks throughout construction.
- Stabilization of open soil surfaces would be implemented within 14 days after grading or construction activities have temporarily or permanently ceased. Slope stabilization will be used to minimize erosion on slopes of 3:1 or steeper.
- The contractor or subcontractor would be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan.

Excavation within the Runway 22R intertidal zone would be completed primarily during periods of low tide. The area would be surrounded by a siltation curtain/debris boom to contain and minimize any debris or siltation. Construction completed at the Runway 22R end would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts. The gabions wrapped with filter fabric installed during the first phase of construction would also act as a barrier to sediment releases and reduce resulting turbidity beyond the project limits.



S.5.4.2 Hazardous Materials

The sediments in the Runway 22R area were sampled and subjected to both physical and chemical analyses in accordance with the Massachusetts Water Quality Certification Regulations and the results were compared to NOAA's Sediment Quality Guidelines. The sediments are not anticipated to contain hazardous materials. However, in order to reduce the potential for any hazardous material to be released during dredging or excavation, the soils would be further pre-characterized through soil sampling.

S.5.4.3 Surface Transportation

Runway 33L RSA improvements will be constructed primarily from the water, which substantially reduces the number of construction vehicles accessing the airport. The Logan Airport roadways can support the anticipated construction-related traffic; therefore, no project-specific mitigation or transportation access plan is needed. Massport requires all contractors to limit construction-related traffic to access and egress to the airfield via only state and federal highways and the Airport roadway network, prohibiting construction-related traffic on the local East Boston roadways. Massport also requires contractors to implement construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan TMA.

S.5.4.4 Air Quality

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 transport vessels; evaporative emissions from asphalt placement and curing; and the generation of fugitive dust from disturbance of unpaved areas. As part of its project approvals process, Massport requires all contractors to adhere to certain construction guidelines that relate to:

- Construction vehicle/equipment anti-idling;
- Retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters; and
- Construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan TMA.

S.6 Permits and Approvals

In addition to compliance with NEPA and MEPA, a number of state and federal permits are needed for the proposed Project, as listed in Table S-4. Permitting for both the Runway 33L and Runway 22R RSA improvements would be similar since many of the same resources would be affected. Chapter 4, *Environmental Consequences*, provides additional project details relative to the project impacts. In response to that filing, DEP has issued a letter listing specific information required for its review of the WPA Variance request (see Appendix 4, *Agency Correspondence*).



Table S-4 Required Permits and Approvals

Issuing Agency	Approval or Permit	Status
U.S. Army Corps of Engineers	Clean Water Act, Section 404 and Section 10 Individual Permit	Submitted January 2011
U.S. Environmental Protection Agency Region I	National Pollutant Discharge Elimination System Construction General Permit	Not yet applied for – SWPPP will be developed by Contractor
Massachusetts Office of Coastal Zone Management	Coastal Zone Management, Federal Consistency Determination	Not yet applied for – requires Final MEPA Certificate
Massachusetts Executive Office of Energy and Environmental Affairs	Public Benefits Determination	See Chapter 5
Massachusetts Department of Environmental Protection	Massachusetts Wetlands Protection Act Variance	Variance Request Submitted March 2010
	Massachusetts Public Waterfront Act Approval (Chapter 91)	Submitted January 2011
	Clean Water Act, Section 401 Water Quality Certificate	Submitted January 2011
	Section 61 Finding	See Chapter 5

S.7 Draft EIR Certificate Requirements

The Secretary’s Certificate on the Draft EIR required specific information to be included in the Final EA/EIR (see Appendix 2). Table S-5 lists the general requirements of the Certificate and where in the Final EA/EIR that information can be found.

Table S-5 Draft EIR Certificate Requirements

Requirement	Final EA/EIR Section
Prepare a joint submittal and review of EA and EIR	Entire Document
Continue to work with Working Groups	Chapter 7
Distribute the Final EA/EIR to the shellfish industry and local shellfish representatives and libraries	Chapter 8
Provide outreach and a briefing for shellfish industry and representatives	Section 7.2.1
Investigate further minimization of impacts from preferred alternatives	Chapter 2
Provide a greater level of detail and commitment to mitigation measures	Chapter 5
Provide design-level plans depicting resource area impacts and mitigation	Chapter 5
Provide detailed construction and operational specifications for mitigation	Chapter 5
Further analysis of proposed mitigation sites based on public and agency feedback	Chapter 5
Refine mitigation goals based on public and agency feedback	Chapter 5
Identify mitigation measures for land under water/intertidal areas and mudflats/coastal beach	Chapter 5
Propose salt marsh mitigation that adequately compensates for functions and values lost	Chapter 5



Table S-5 Draft EIR Certificate Requirements (continued)

Requirement	Final EA/EIR Section
Identify, in consultation with Eelgrass Working Group and others, the site of eelgrass re-establishment/ restoration at a minimum of 3:1 replacement to loss ratio	Chapter 5
Provide a detailed and thorough description of the impacts to and mitigation for eelgrass	Chapter 5
Consider the possibility of out-of-kind mitigation for eelgrass	Chapter 5
Develop an eelgrass strategy with the greatest possible benefits to eelgrass habitat in Boston Harbor and beyond	Chapter 5
Provide a short list of viable salt marsh mitigation sites	Chapter 5
Identify no less than a 2:1 salt marsh mitigation ratio or higher ratio for emergent wetlands, with first priority for the restoration or re-establishment of existing wetlands, and a higher ratio for enhancement of other salt marsh to be determined by the Salt Marsh Working Group	Chapter 5
Provide a detailed and thorough description of the mitigation for salt marsh	Chapter 5
Update information on Broad Meadows project in Quincy as potential mitigation	Chapter 5
Refine shellfish mitigation plans to specify terms and procedures for the harvest and transplant of shellfish	Chapter 5
Refine mitigation in anticipation of the filing of the Chapter 91 Variance License application	Chapter 5
Identify any opportunities to provide access to tidelands for shellfishing, at the project site or in other locations	Chapter 5
Provide further information on the overall public benefits provided by the project	Chapter 6
Provide more detail on habitat enhancements as a result of the project	Chapter 5
Address impacts to shellfish and shellfishing	Section 4.2 and 4.3
Survey large piers to understand the condition of underlying shellfish and benthic habitats	Section 4.2.3
Continue working with Working Groups to develop methodology for assessment of impacts to shellfish	Chapter 5, Chapter 7
Complete sediment sampling and testing information and provide a discussion of dredge material disposal options for Runway 22R	Section 4.3.5
Reconsider BMPs for construction-related increases of sedimentation and turbidity	Chapter 5
Evaluate Environmentally Sensitive Site Design and Low Impact Development measures	Section 4.2.5 and 4.3.5
Identify how construction will be undertaken to minimize impacts to resources	Chapter 5
Develop construction-related traffic plan	Section 4.2.9 and 4.3.9
Strive to incorporate environmental sustainability measures	Chapter 6
Provide a Statement of Compliance with the: <ul style="list-style-type: none"> • Massachusetts Wetlands Protection Act Variance Criteria • Massachusetts Chapter 91 License and Variance Criteria • Public Benefits Determination • Section 401 Water Quality Certification • Massachusetts Stormwater Management Standards 	Section 6.5 Section 6.6 Section 6.7 Section 6.8 Section 6.5.3
Respond to comments	Appendices 2 and 3



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Purpose and Need


The Massachusetts Port Authority (Massport) is proposing to enhance the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport (Logan Airport). The location of the safety improvements are shown on Figure 1-1. The proposed safety improvements are required to enhance the RSAs, to the extent feasible, to be consistent with the Federal Aviation Administration's (FAA) current airport design criteria for RSAs and to enhance rescue access in the event of an emergency. As an older airport, Logan Airport was constructed before many of the current safety standards were developed and several of the runways currently end at the water's edge. Standard RSAs at commercial-service airports like Logan, 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 Airport Design Advisory Circular,¹ to the extent feasible.

The existing RSA at the end of Runway 33L does not meet standard FAA design criteria for overrun and undershoot protection for the design aircraft for that runway, the Boeing 747-400. The existing RSA is 187.5 feet long and 500 feet wide. Within this area is a 158-foot long and 170-foot wide Engineered Material Arresting System (EMAS) bed, installed by Massport in 2006 as an interim safety measure. An EMAS bed is constructed of collapsible concrete blocks with predictable deceleration forces. When an aircraft rolls into an EMAS bed, the tires of the aircraft collapse the lightweight concrete, the aircraft is slowed down in a way that minimizes damage to the aircraft and injury to its passengers. The existing EMAS bed is designed to be capable of arresting a Boeing 757-200 exiting the runway at a speed of 38 knots or less or a Boeing 737-800 at 42 knots or less, but provides minimal arrestment for the design aircraft, the Boeing 747-400. The existing Runway 33L RSA is also too short to provide undershoot protection consistent with the FAA criteria. The proposed project is intended to enhance the Runway 33L RSA so that it provides overrun and undershoot protection consistent with the design criteria in the FAA's Airport Design Advisory Circular (*Advisory Circular 150/5300-13, Airport Design*, December 31, 2009) to the extent feasible. In addition to these key safety benefits, the project has the added

¹ United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.



Legend

 RSA Improvements



0 625 1,250 2,500 Feet



Logan RSA

Figure 1-1

Location of Proposed Safety Improvements



benefit of reducing the potential adverse environmental effects of an airplane landing in Boston Harbor in the event of an aircraft accident.

The existing RSA at the end of Runway 22R meets the minimum FAA design criteria for overrun protection for the runway's design aircraft but does not comply with undershoot requirements. Runway 22R is very rarely used for arrivals and has an 815-foot displaced threshold. The Runway 22R RSA improvement is primarily intended to protect aircraft in the event that an aircraft arriving on Runway 4L overruns and fails to stop on the runway. The existing RSA is 215 feet long and 500 feet wide, and includes a 190-foot long and 170-foot wide EMAS bed. The EMAS bed provides the minimum arrestment speed acceptable by the FAA (40 knots) for the design aircraft, the Boeing 757-200. The Runway 22R EMAS bed also provides arrestment at higher speeds for many of the smaller aircraft frequently using this runway. The arresting performance improves with lighter aircraft (e.g., EMAS bed will arrest a Boeing 737-800 that leaves the runway at 51 to 57 knots or less and a CRJ-200 that leaves the runway at 60 to 66 knots or less). As a condition of approving the installation of the existing EMAS bed, the FAA required Massport to consider options for further enhancing the level of safety provided by the RSA. The proposed safety improvements at this location are consistent with that commitment.

In support of agency review of the project as a step in the formal permitting process, this Chapter describes the agency findings related to purpose of and need for the proposed RSA improvements and describes the FAA airport design criteria for RSAs.

1.1 Purpose of the Project

The purpose of the project is to increase safety for aircraft and their passengers in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's design standards. The United States Army Corps of Engineers (USACE) has adopted this as the project purpose under Section 404 of the Clean Water Act.²

1.2 FAA Design Criteria for Runway Safety Areas

The FAA requires commercial service airports to provide a safety area 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 "excursion" from the runway in an emergency situation. An "excursion" from the runway can include an overrun (an arriving aircraft fails to stop before the end of the runway, or an aborted takeoff), 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 FAA requires that commercial service airports, regulated under 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*, provide standard RSAs where possible. In November 2005, Congress mandated that all commercial airports improve their RSAs by 2015.

² Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.



The FAA determines minimum dimensional standards for RSAs based on the “critical” or “design” aircraft that operates or is forecasted to operate at an airport. The RSAs for Runway 33L and Runway 22R do not meet the FAA standards.

The design criteria for RSAs are provided in the FAA’s *Advisory Circular 150/5300-13, Airport Design*, December 31, 2009.³ The FAA Airport Design Advisory Circular contains a coding system, referred to as the Airport Reference Code (ARC), which standardizes design requirements for airports. The ARC contains design requirements for the length and width of runways and taxiways, and requirements for the associated RSAs, all of which are based on the type of aircraft that currently, or are expected to use the airport in the future. The ARC is an alphanumeric code that categorizes various aircraft based upon the approach speed (alpha) and wingspan (numeric); the higher the alphanumeric code, the larger and more demanding the aircraft. An ARC of A-I defines the design dimensions for small airports that serve small single and multi-engine aircraft, while an ARC of D-V defines the design dimensions for larger airports that serve large multi-engine commercial service aircraft.⁴ Runways, taxiways, and associated safety areas are designed to accommodate the design aircraft, which is the most demanding aircraft (the aircraft with the highest landing speed and widest wingspan) expected to use an airport on a regular basis, now or in the future.⁵

The Boeing 747-400, which falls into one of the highest ARC categories and groups (D-V), is the design aircraft for Runway 15R-33L.⁶ The Boeing 757-200 is the design aircraft for Runway 4L-22R and falls into the midrange of ARC categories and groups (C-IV).⁷ The standard RSA for both of these large commercial service aircraft and newer, larger jets such as the A-380 and B747-800, is 1,000 feet long and 500 feet wide at each runway end. FAA standards require that RSAs are:⁸

- Cleared and graded with no potentially hazardous ruts, humps, depressions, or other surface variations;
- Drained by grading to prevent water accumulation; and
- Capable under dry conditions of supporting snow removal and aircraft rescue fire fighting (ARFF) equipment, and the occasional passage of aircraft without causing significant damage to the aircraft.

3 United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.

4 Edwards and Kelcey, Inc., *Massport Runway 15R-33L Safety Area Study Technical Report*, December 2005, p. 03-1.

5 *ibid.*

6 SH&E, Inc, Edwards and Kelcey, Inc., Flight Transportation Associates, Inc., *Massport Runway 15R-33L Safety Area Study*, December 2005, pp. 03-1-03-3 and 05-9.

7 SH&E, Edwards and Kelcey, and Flight Transportation Associates, *Runway 4L/22R Safety Area Analysis*, March 29, 2004.

8 United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.



At airports where space is limited and land is not available to accommodate the standard 1,000-foot long by 500-foot wide RSAs, the FAA has approved the use of EMAS to provide equivalent overrun protection. EMAS is a bed of collapsible concrete blocks with predictable deceleration forces. In an emergency situation, when an aircraft rolls into an EMAS bed, the tires of the aircraft collapse the lightweight concrete, and the aircraft is slowed down in a way that minimizes damage to the aircraft.⁹ FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Materials Arresting Systems*, states that EMAS should provide “protection against overruns by the design aircraft exiting the runway at 70 knots (but no less than 40 knots).”¹⁰ The FAA has determined that an EMAS bed with a 70-knot arrestment speed (based on the design aircraft) provides a level of safety that is generally equivalent to a full 1,000-foot long RSA. The standard 1,000-foot long RSA can be reduced to 600 feet if an EMAS system is installed and if the runway has either instrument or visual vertical guidance for approaches in the opposite direction. If the runway does not have vertical guidance, the RSA would need to be 1,000 feet in length to meet the design criteria in the FAA Airport Design Advisory Circular.¹¹



Aircraft arrested by EMAS.
Photograph courtesy of Zodiac Aerospace

Table 1.2-1 summarizes the design criteria, as per the FAA Airport Design Advisory Circular,¹² for the RSAs at the ends of Runway 33L and Runway 22R where enhancements are proposed.

⁹ Federal Aviation Administration Fact Sheet, *Engineered Material Arresting System (EMAS)*, June 15, 2007.

¹⁰ U.S. Department of Transportation, Federal Aviation Administration, FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Materials Arresting Systems*, March 15, 2004, p. 4, Paragraph 7b.

¹¹ United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.

¹² *ibid.*



Table 1.2-1 FAA Design Criteria for Runway 33L and Runway 22R RSAs

FAA Design Criteria	Runway 33L RSA ¹	Runway 22R RSA ²
Existing RSA	187.5 feet long and 500 feet wide, including an EMAS bed	215 feet long and 500 feet wide, including an EMAS bed
Conventional RSA	1,000 feet long and 500 feet wide	1,000 feet long and 500 feet wide
RSA with EMAS Bed ³		
RSA	600 feet long and 500 feet wide	600 feet long and 500 feet wide
EMAS Bed		
With 60 psi Strength Blocks	352 feet long (40-knot arrestment speed EMAS bed) ¹ and 150 feet wide ^{4,5}	190 feet long (40-knot arrestment speed EMAS bed) ⁴ and 150 feet wide ^{4,6}
	676 feet long (70-knot arrestment speed EMAS bed) ² and 150 feet wide ^{4,5}	466 feet long (70-knot arrestment speed EMAS bed) ⁴ and 150 feet wide ^{4,6}
With 80 psi Strength Blocks	500 feet long (70-knot arrestment speed EMAS bed) ² and 150 feet wide ⁴	Not feasible at this location based upon fleet mix and design aircraft

1 The RSA must provide overrun and undershoot protection for the design aircraft, the Boeing 747-400 (ARC D-V).

2 The RSA must provide overrun protection for the design aircraft, the Boeing 757-200 (ARC C-IV).

3 The EMAS bed is constructed within the footprint of the overall RSA length and width. The EMAS bed footprint is typically smaller than the overall RSA dimensions.

4 For Runways 33L and 22R a width of at least 150 feet is required.

5 SH&E, Inc., Edwards and Kelcey, Inc., Flight Transportation Associates, Inc., *Massport Runway 15R-33L Safety Area Study*, December 2005, p. 05-11.

6 Vanasse Hangen Brustlin, Inc. and Jacobs Edwards and Kelcey, Inc., *Draft Runway 22R Safety Area Improvements Alternatives Feasibility Study Technical Report*, July 24, 2007.

1.3 Need for the Project

Logan Airport, as a commercial service airport that receives federal funding for airport improvement projects, is required by the FAA to meet the RSA design criteria contained in the FAA Airport Design Advisory Circular,¹³ to the extent feasible.

This project would advance an overriding public interest. The public interest served is aviation safety. Safety enhancements to the RSAs reduce the potential for injury to passengers, aircraft crew, and airport employees. RSAs reduce the risk of damage to aircraft and injury to persons 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 safely. The USACE has determined that the public interest served is safety as indicated in its letter determining the project purpose.¹⁴

At the state level, the Massachusetts Department of Environmental Protection (DEP) has determined that RSA improvements advance an overriding public interest, meet the standard for the DEP to issue a variance from the Massachusetts Wetlands Protection Act. Variances have previously been issued to Massport for RSA

13 United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.

14 Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.



improvements at Runway 22L at Logan Airport (DEP Variance File No. 6-554/82-118, May 4, 1993) and Hanscom Field (DEP Variance File No. 103-0635, April 11, 2008). DEP has also issued variances for RSA approvals at the Gardner, New Bedford, North Adams, Norwood, Pittsfield, and Provincetown Airports.

1.3.1 Runway 33L

The existing RSA at the end of Runway 33L does not meet current FAA design criteria (Table 1.2-1) for overrun and undershoot protection for the runway's design aircraft, the Boeing 747-400. The existing RSA is 187.5 feet long and 500 feet wide. Within this area is a 158-foot long and 170-foot wide EMAS bed, installed in 2006 as an interim safety measure. The existing EMAS bed is constructed of 60 pounds per square inch (psi) strength blocks and is capable of arresting a Boeing 757-200 exiting the runway at a speed of 38 knots or less or a Boeing 737-800 at 42 knots or less,¹⁵ but provides minimal arrestment of the design aircraft, the Boeing 747-400. The existing Runway 33L RSA also does not provide undershoot protection consistent with the FAA criteria. There is a need to enhance the Runway 33L RSA so that it provides overrun and undershoot protection consistent with the current design criteria in the FAA's Airport Design Advisory Circular¹⁶ (Table 1.2-1) to the extent feasible.

The Runway 33L end was the site of a fatal aircraft accident at Logan Airport in 1982. On the evening of January 23, 1982, World Airways Flight 30, a McDonnell Douglas DC-10-30 airplane carrying 212 passengers from Newark International Airport, touched down on Runway 15R-33L approximately 2,800 feet beyond the normal landing threshold. The runway was icy and the braking conditions were poor. When they determined that they could not safely stop the aircraft on the runway, the pilots steered the plane to avoid hitting the approach light pier. The aircraft skidded to a stop and the forward section of the plane separated and landed in the harbor. Two passengers in the forward section were never found and were presumed dead. This project seeks to protect aircraft and passengers from precisely this risk, as well as protecting aircraft arriving over the water that may land short of the runway.

On March 3, 2009, the United States Department of Transportation Office of Inspector General (DOT OIG) released a report entitled *Actions Taken and Needed to Improve FAA's Runway Safety Program*. The report states that:

"...over the last 10 years, 75 aircraft have overrun or veered off the Nation's runways, resulting in nearly 200 injuries and 12 fatalities. In February 2005, 14 people were injured after an aircraft overran a runway at Teterboro Airport in New Jersey. Ten months later, another aircraft skidded off a runway while landing in icy conditions at Chicago's Midway Airport. The aircraft finally stopped in a public street – killing 1 person and injuring 4 persons in a car and another 18 on board the aircraft."^{17, 18}

15 Final Design Report for an EMAS at Runway 33L End at General Logan International Airport in East Boston, MA, Engineered Arresting Systems Corp. (ESCO), August 24, 2006, pp. 9 - 10.

16 United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.

17 United States Department of Transportation, Office of Inspector General, *Actions Taken and Needed to Improve FAA's Runway Safety Program*, March 3, 2009, p. 1.



The report goes on to indicate that, while FAA has made significant progress in improving RSAs as required by the 2005 mandate by Congress, further action is needed. The DOT OIG report made specific recommendations, including proposals that FAA take action at eleven of the nation's largest airports.¹⁹ Logan Airport was one of the eleven priority airports that the DOT OIG identified as requiring further action to improve RSAs. Specifically, the DOT OIG acknowledged installation of the existing EMAS bed by Massport in 2006 as an interim safety measure for Runway 33L, but stated that FAA and Massport should complete the full RSA improvements as soon as possible.²⁰ The report noted that "critical RSA improvements need to be made sooner rather than later to lower the risk of passenger injuries and aircraft damage in the event of runway accidents." To achieve this goal, FAA's current Airport Capital Improvement Program for Logan Airport has allocated funding for the Logan Airport RSA project beginning in 2011.

1.3.2 Runway 22R

The existing RSA at the end of Runway 22R provides overrun protection for the runway's design aircraft, the Boeing 757-200, due to the existing EMAS bed. The RSA is 215 feet long and 500 feet wide, and includes a 190-foot long and 170-foot wide EMAS bed constructed of 60 psi strength blocks. The EMAS bed provides the minimum arrestment speed acceptable by the FAA (40 knots) for the design aircraft, the Boeing 757-200. The Runway 22R EMAS bed also provides arrestment at higher speeds for many of the smaller aircraft frequently using this runway. The arresting performance improves with lighter aircraft. The EMAS bed will arrest a Boeing 737-800 that leaves the runway at 51 to 57 knots and a CRJ-200 that leaves the runway at 60 to 66 knots.²¹ Because the existing RSA does not meet FAA's dimensional standards, as a condition of approving the installation of the existing EMAS bed the FAA required Massport to pursue additional improvements beyond the limits of the interim EMAS and to construct practical improvements to upgrade the safety area to better serve any anticipated future fleet mix with less operational restrictions on the runway.²² While the EMAS bed increased the safety of the Runway 22R RSA, additional improvements are needed to protect aircraft that are not stopped by the EMAS, and to provide access to the water for emergency responders.

Consistent with this request, Massport has considered options for enhancing the level of safety of the existing RSA for both overruns (aircraft landing on Runway 4L and exiting the runway at the Runway 22R end) and undershoots (aircraft landing short on Runway 22R). The FAA and Massport determined that the undershoot requirement is mitigated by the operational use of Runway 22R and its geometry. In reviewing the layout and functionality of Runway 22R, historically this runway has rarely been used for arrivals. In addition, its arrival threshold is displaced 815 feet from the actual end of the runway. While this 815-foot displacement area is available for Runway 4L arrival roll-out and Runway 22R departures, it is not available for Runway 22R arrivals. According to the FAA, the displacement area can be used to satisfy undershoot requirements for Runway 22R arrivals. The remaining requirement for vertical guidance has been satisfied through the

18 On January 19, 2010, EMAS was credited with safely stopping a US Airways/PSA Airlines Canadair CRJ-200 en route from Charleston West Virginia to Charlotte, North Carolina. During takeoff, the pilot overran Runway 23. The takeoff was aborted as the pilot responded to a warning signal, coming to a stop in the EMAS bed before a steep drop at the runway's end. There were no reported injuries.

19 United States Department of Transportation, Office of Inspector General, Actions Taken and Needed to Improve FAA's Runway Safety Program, March 3, 2009, p. 3.

20 United States Department of Transportation, Office of Inspector General, Actions Taken and Needed to Improve FAA's Runway Safety Program, March 3, 2009, p. 11.

21 SH & E, Inc, Edwards and Kelcey, Inc., Flight Transportation Associates, Inc., Runway 4L/22R Safety Area Analysis, March 29, 2004, p. 16.

22 Federal Aviation Administration, Runway Safety Area Determination: General Edward Lawrence Logan International Airport East Boston, Massachusetts, June 6, 2004, p. 1.



installation of a Precision Approach Path Indicator (PAPI). Therefore, the Runway 22R RSA is intended to protect aircraft in the event that an aircraft arriving on Runway 4L overruns and fails to stop on the runway.

In 1993, the DEP issued a Wetlands Protection Act Variance to construct an inclined safety area at Runway 22L, which has an RSA substantially identical to that proposed for Runway 22R. The Variance Decision stated that:

“...the proposed project will promote an overriding public interest. The inclined safety area at Runway 22L will improve airport operations in the event of an aircraft accident, will help minimize aircraft damage in the event of an overrun/undershoot, and result in enhanced survivability from such accidents.”²³

This same conclusion applies with equal force to the proposed Runway 22R RSA.

23 DEP Variance File No. 6-554/82-118, May 4, 1993.



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2

Alternatives

This chapter describes the existing Runways 33L and 22R, their RSAs, and the process undertaken by Massport and FAA to identify reasonable alternatives for enhancing safety at the existing runway ends. The proposed RSA improvements are safety enhancements and do not extend the runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways. As required by the Secretary's Certificate on the Draft Environmental Assessment/Environmental Impact Report (EA/EIR), the Massachusetts Environmental Policy Act (MEPA), and the National Environmental Policy Act (NEPA), this Final EA/EIR summarizes alternatives that have been evaluated for the project and describes the proposed action. The only requirement of the Secretary's Certificate is to investigate whether the Runway 33L and Runway 22R proposed actions can be further minimized.

2.1 No-Action/No-Build Alternative

The NEPA process requires that the Proposed Action be compared to the No-Action/No-Build Alternative. Similarly, the MEPA process requires consideration of a no-action/no-build alternative. In this Final EA/EIR, the No-Action/No-Build Alternative assumes that Runway 33L or Runway 22R RSA enhancements would not occur and routine maintenance at the airport would continue. Other airport projects occurring in the same timeframe of the RSA improvements, such as the separate project to repave Runway 15R-33L and the Southwest Service Area (SWSA) Redevelopment Program including a Consolidated Car Rental Facility, and other landside projects are assessed under cumulative impacts (Section 4.4). Other airport projects also are analyzed in the Logan Airport Environmental Data Report (EDR) which annually discloses the projects underway or under consideration at Logan Airport.

2.2 Runway 33L

This section summarizes the alternatives considered for the Runway 33L RSA, including a description of the Proposed Action, construction methods and phasing, and estimated project costs. In the Draft EA/EIR, as directed by the Secretary's Certificate on the ENF, Massport evaluated a 600-foot long by 300-foot wide RSA



with EMAS on a pile-supported deck as the preferred alternative.¹ The Draft EA/EIR evaluated five construction options in detail. The five construction options are retained by Massport in order to maintain flexibility in the design/build process being undertaken for the Runway 33L safety improvements. These options would have the same deck dimensions and therefore the same impacts to eelgrass, and have only small differences in the direct impacts of the pilings, which would range from 460 square feet to 1,175 square feet. The preferred alternative will be identified once the design/build contractor has been selected, and is likely to be a modification of one of these five construction options. Consistent with the requirement of the Secretary's Certificate on the Draft EA/EIR, Massport will continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree possible.

2.2.1 Description and Use of Runway 33L

At 10,083 feet, Runway 15R-33L is the longest of Logan Airport's six runways. As shown on Figure 1-1, the Runway 33L end is at the eastern edge, and the Runway 15R end is at the western edge of the airfield. Runway 15R has a displaced threshold, which is a runway threshold that is located at a point other than the physical beginning of a paved runway surface. 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 take-offs. The 880-foot displaced threshold for Runway 15R is in place to give aircraft arriving on Runway 15R clearance over obstructions in East Boston (an elevated highway). It is located 880 feet from the west end of the runway which reduces the length of runway available for arrivals by 880 feet; therefore, the landing length available on Runway 15R is 9,203 feet. The departure length for Runway 15R remains at 10,083 feet. The displaced threshold has no effect on arriving or departing aircraft using Runway 33L, which can use the full 10,083-foot length.

Runways 33L and 15R are used for both arrivals and departures. In 2009, 3 percent of all jet aircraft departures and 3 percent of all jet aircraft arrivals occurred on Runway 15R, while 16 percent of all jet aircraft departures and 11 percent of all jet aircraft arrivals occurred on Runway 33L.²

Runway 15R-33L is the runway that is used by the majority of heavy aircraft serving international and national destinations. Although Runway 15R-33L accommodates a number of different aircraft, including turboprops and heavy, light, and regional jets, it is the longest runway at Logan Airport and is designed to handle heavy long-haul commercial jet aircraft (Airbus 330/340 and Boeing 747/777) serving international markets in Europe/Middle East, Canada, Central/South America, Bermuda/Caribbean, and Asia/Pacific. Runway 15R-33L is also the critical runway for expected, long-haul international service to destinations in Asia including Beijing, Shanghai, and Tokyo. In 2009, Logan Airport accommodated 34,198 international operations, representing 9 percent of the total aircraft operations that year (345,306).³ Runway 33L is also favored by heavy jet aircraft because it has few off-airport flight path obstructions. Runway 15R-33L is the preferred over-water arrival and departure runway for noise abatement night-time operations by heavy, wide-body commercial jets.

¹ Subsequent to the Draft EA/EIR, the FAA and Massport determined that an 18-inch additional dimension is necessary along the sides of the deck to provide a curb and frangible barrier to prevent emergency vehicles and personnel from falling over the edge of the deck. These safety features can be accommodated within the existing deck length.

² Massachusetts Port Authority, *Boston-Logan International Airport 2009 Environmental Data Report*, September 2010.

³ *ibid.*



RSAs are located at either end of Runway 15R-33L. The RSA for the Runway 15R end is 500 feet wide and 1,000 feet long beyond the runway end, meeting the FAA standard RSA dimensions for the runway's design aircraft. The Runway 33L RSA is intended to provide protection in the event that an aircraft arriving on Runway 15R fails to stop before the end of the paved runway surface or runway threshold (an overrun) or in the event that an aircraft arriving on Runway 33L lands short of the runway threshold (an undershoot). The existing RSA for the Runway 33L end (Figure 2-1) is 187.5 feet long and 500 feet wide. A 158-foot long and 170-foot wide Engineered Material Arresting System (EMAS) bed was installed (within that area, and set back 13 feet from the runway threshold) in 2006 as an interim safety enhancement. The existing RSA for the Runway 33L end provides some protection for aircraft in the event of an overrun, but does not provide the level of protection for aircraft overruns and undershoots required by FAA's Airport Design Advisory Circular.⁴

Runway 15R-33L is equipped with navigational aids (navaids). Navaids include visual or electronic devices, either airborne or on the ground, that provide guidance information or position data to aircraft using the runway. At the Runway 33L end these include:

- Instrument Landing System (ILS) including localizer and glide slope antenna (rated as Category II);
- Very High Omni-Directional Range/Distance Measuring Equipment (VOR/DME);
- Medium intensity approach lighting system with runway alignment indicator lights (MALSR). A MALSR is an approach light system that extends 2,400 feet away from the runway threshold that is a required component of an ILS approach. The MALSR lights, spaced at 200-foot intervals, are located on a pile-supported timber pier that extends 2,400 feet into Boston Harbor; and
- A precision approach path indicator (PAPI). A PAPI is a visual guidance aid that provides pilots with visual approach slope guidance to the runway touchdown area, which is 1,000 feet down the runway from the runway end.

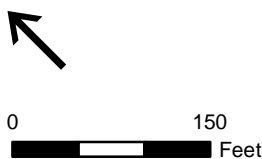
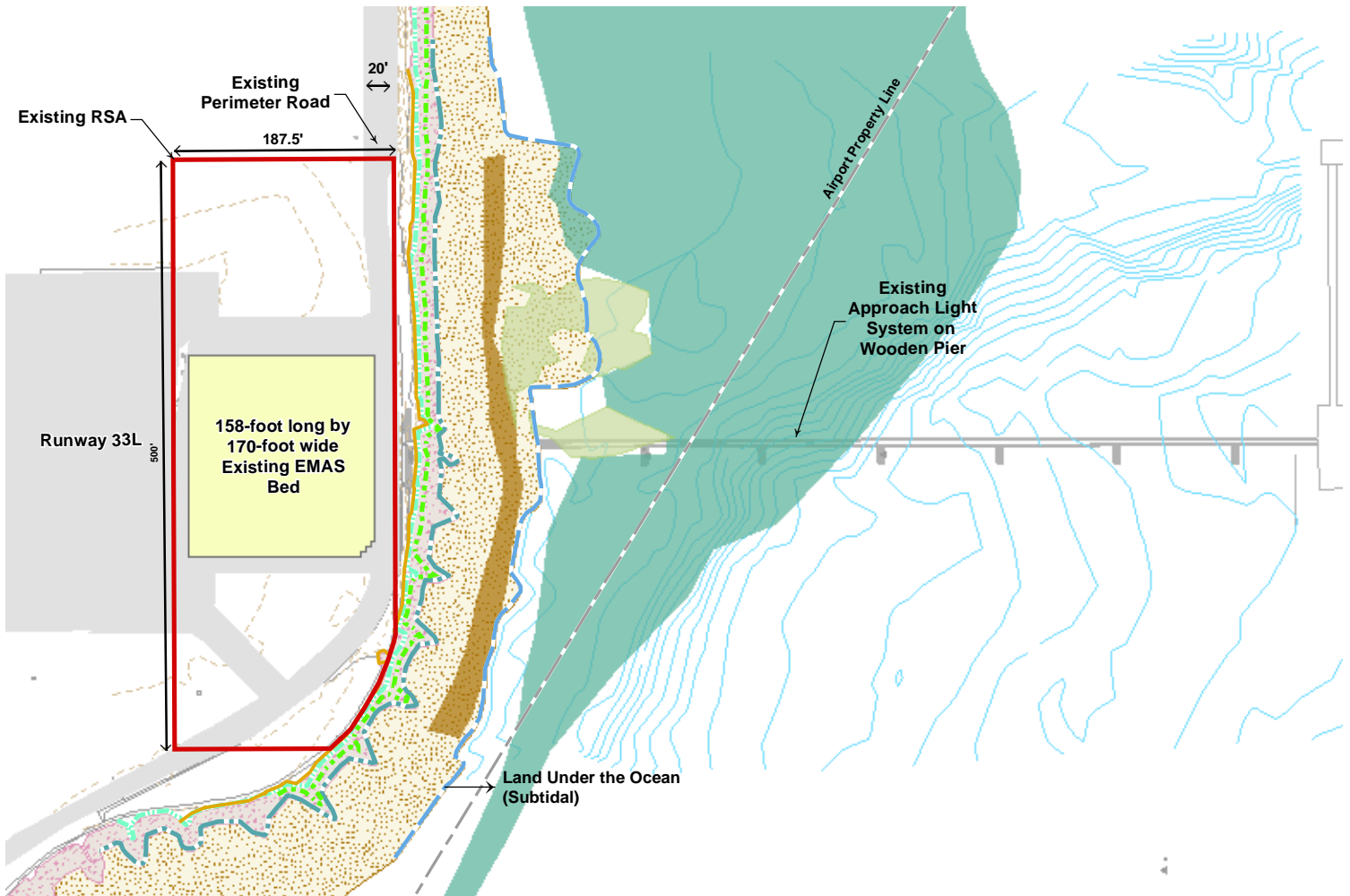
A 20-foot wide airport perimeter road is located within the Runway 33L RSA. The perimeter road is used by airport maintenance vehicles, emergency vehicles such as firefighting trucks, State Police, Massport Operations, FAA, and construction vehicles. The perimeter road provides a vital link to key locations around the airfield and is necessary for airport operations and emergency response.

2.2.2 Runway Safety Area Enhancement Alternatives for Runway 33L

This section summarizes the process undertaken by Massport and FAA to identify reasonable alternatives for enhancing the RSA at the end of Runway 33L. This is followed by a description of the RSA alternatives evaluated for Runway 33L and the proposed action.

⁴ United States Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15, December 31, 2009

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Legend

- Existing RSA
- Existing EMAS Bed
- Coastal Bank
- Coastal Beach (Intertidal)
- Raised Mussel Bed
- Cobble Mussel Bed
- Limit of Eelgrass
- Existing Contour
- Existing Bathymetric Contour
- Highest High Water (7.3')
- Mean High Water (5.13')
- Mean Low Water (-4.36')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage



Logan RSA

Figure 2-1

Existing Runway 33L RSA

Source: Jacobs Edwards & Kelcey, Inc. Childs Engineering Corps. VHB Field Work - 2008; 2010



A multi-tiered screening process was established by Massport and FAA to identify reasonable alternatives for enhancing the RSA at the end of Runway 33L. The screening process and screening criteria are described below and shown in Figure 2-2.

- **Screening Level 1 – Candidate Alternatives.** Several initial or candidate alternatives were developed to meet the current FAA RSA design criteria. Runway utility and capacity were used as screening criteria to assess whether a candidate alternative should be carried forward for further analysis in the next stage of the screening process or eliminated from further consideration. Each candidate alternative was assessed based on whether it maintained normal runway operations, maintained the utility and capacity of Runway 15R-33L, and maintained the types of aircraft that can currently use the runway.

As discussed in the Draft EA/EIR and in the ENF, Massport and FAA determined that only Candidate Alternative 4 (Full 1,000-foot Long RSA) would be retained on the basis that it would not reduce safety or have any adverse impact on the utility of Runway 15R-33L. This alternative was carried forward for further analysis in the second level of the screening process.

- **Screening Level 2 – Preliminary Alternatives.** Based on the results of the first level of the screening process, preliminary alternatives were developed, all of which maintained normal runway operations, the utility and capacity of Runway 15R-33L, and the types of aircraft that can currently use the runway. Potential environmental impacts and feasibility (constructability and cost) were used as screening criteria to assess whether a preliminary alternative should be carried forward for further analysis in the Draft EA/EIR or eliminated from further consideration. The potential environmental impact of a preliminary alternative was considered first, and then the constructability and cost of the preliminary alternative was considered. The FAA has a maximum feasible cost guideline of \$25 million for safety area improvements using EMAS with a 70-knot arrestment speed for the design aircraft and 600-foot undershoot protection.⁵ The cost exceeds the guideline at \$51.7 million. However, in the *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, dated January 30, 2009, the FAA determined that with 2 million passengers aboard jet operations in 2007 involving the Runway 33L RSA, it was justified to exceed the \$25 million threshold.⁶

The FAA and Massport determined that Preliminary Alternatives 1 through 3 would be eliminated and that only Preliminary Alternative 4 – 600-Foot Long and 300-Foot Wide RSA with EMAS on a Pile-Supported Deck would move forward into the Draft EA/EIR analysis. The RSA section on land will remain at a width of 500-feet. The Secretary agreed with this conclusion stating that “Because Massport has indicated that several of the examined alternatives are infeasible due to cost or unacceptable environmental impacts, the alternatives that should be carried forward to the DEIR are the 600-foot long by 300-foot wide RSA with EMAS on a pile-supported deck and the no action alternative for Runway 33L.”⁷

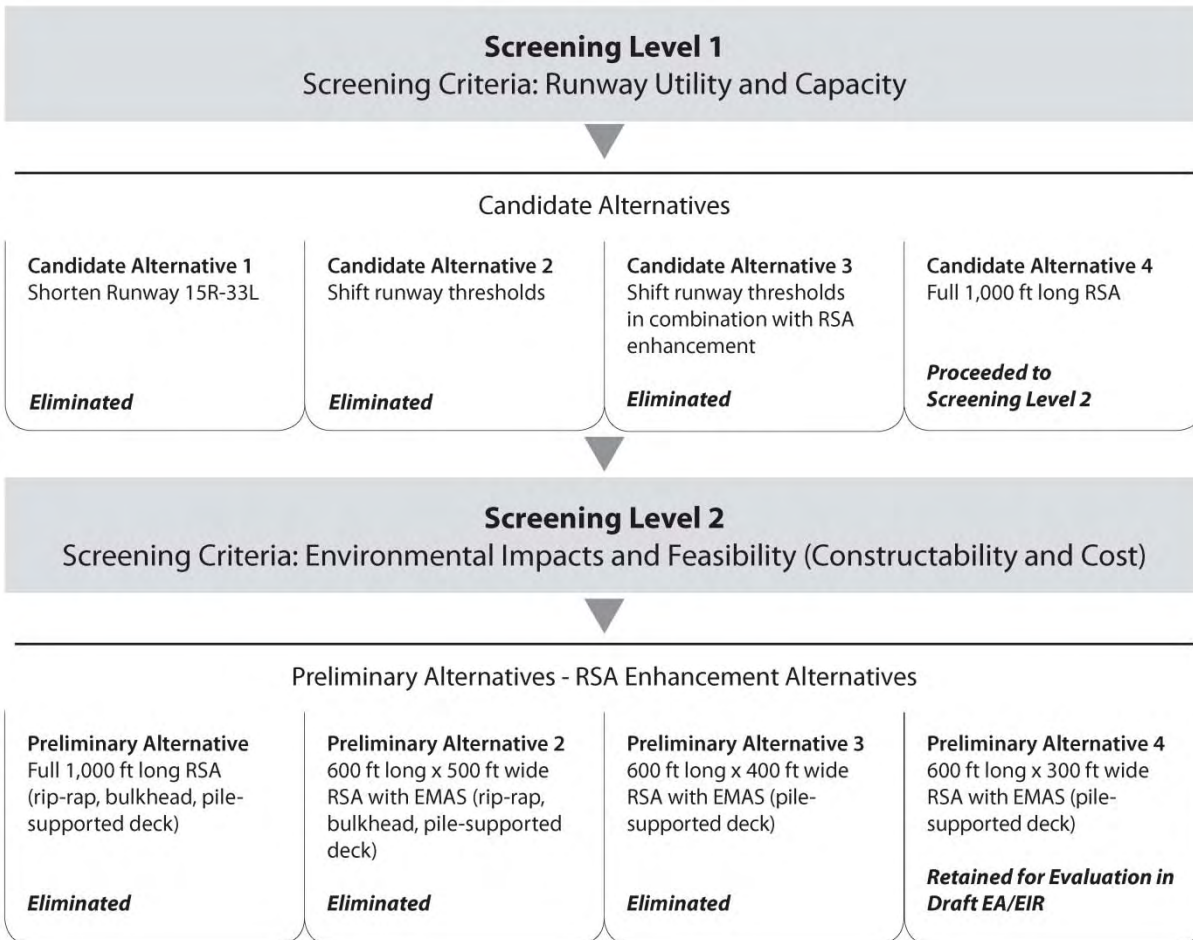
5 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 6.

6 *ibid*, p. 6.

7 EOE #14442 ENF Certificate August 14, 2009.



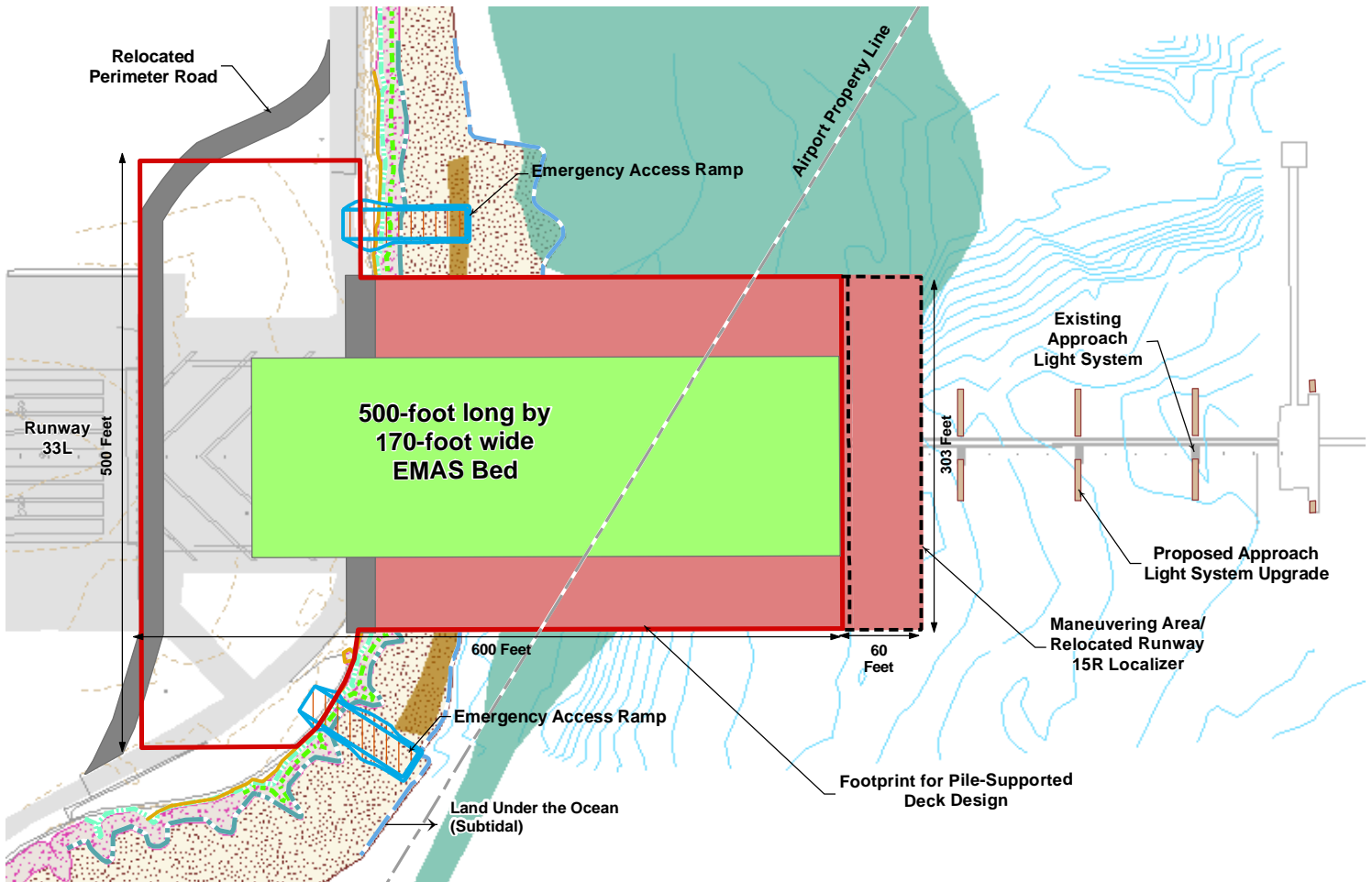
Figure 2-2 Runway 33L Alternatives Screening Process



2.2.3 Runway 33L Proposed Action

The Proposed Action for Runway 33L (Preliminary Alternative 4) is construction of a 600-foot long RSA with EMAS on a Pile-Supported Deck (Figure 2-3). The deck portion of the RSA would be 300 feet wide⁸, with the landside portion remaining 500 feet wide. The Proposed Action also includes moving the existing localizer to a new pile-supported deck at the end of the RSA, and the physical aspects of upgrading the approach light system to a Category III Instrument Landing System (Cat III ILS) to include a High-intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2). Part of the existing timber light pier (approximately 500 feet) would be removed and the approach lights would be incorporated into the new deck. FAA has recently determined that the section of the deck included to support the relocated localizer would also be necessary to provide safe and

⁸ The total deck width would be 303 feet, which includes a 300-foot RSA and a 18-inch curb on either side of the deck, to protect emergency equipment and personnel from falling over the deck edge.



Legend

- New EMAS Bed
- Existing and Proposed RSA
- Pile-Supported Deck
- Approach Slab
- Emergency Ramps
- Maneuvering Area
- Upgraded Approach Light System
- Relocated Perimeter Road

- Existing Contour
- Existing Bathymetric Contour
- Highest High Water (7.3')
- Mean High Water (5.13')
- Mean Low Water (-4.36')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage

- Raised Mussel Bed
- Eelgrass
- Coastal Bank
- Coastal Beach (Intertidal)
- Cobble Mussel Bed

2-7



Logan RSA

Figure 2-3

**Runway 33L
Proposed Runway Safety Area**

Source: Jacobs Edwards & Kelcey, Inc.
Childs Engineering Corps.
VHB Fieldwork - 2008, 2010



adequate maneuvering space at the seaward end of the RSA for emergency responders and any aircraft passengers during an emergency.

While the proposed Runway 33L RSA improvements would result in impacts to the same environmental resources as the rejected alternatives, it would reduce the impacts to the majority of environmental resources including Coastal Bank, Coastal Beach, Land Under the Ocean, and Submerged Aquatic Vegetation (eelgrass). This alternative would also maintain runway utility, and would provide protection and functionality near equivalent to a RSA that fully meets the design criteria.⁹ This is the only alternative that the Secretary's Certificate on the ENF required be carried forward in the Draft EA/EIR, and was identified in the Certificate on the Draft EA/EIR as the preferred alternative.¹⁰ This was the alternative proposed by the FAA in its determination based on environmental impacts and cost.¹¹

The proposed Runway 33L RSA improvements would extend the length of the existing RSA from 187.5 feet to 600 feet. The new section of the RSA would have a width of 300 feet, on a 303-foot wide deck. While the RSA would not fully comply with the current design criteria in the FAA's Airport Design Advisory Circular for RSAs¹² in terms of width, the FAA New England Region determined that the risk of an undershoot occurring outside of the 300-foot width is reduced by centerline guidance of the existing CAT II ILS and MALSR visual aid on the runway.¹³ The FAA strongly rejected consideration of any length of less than 600 feet "since the marginal costs and environmental impacts were not judged significant enough to offset the compromises in RSA function."¹⁴ Further minimization, as requested by the Secretary's Certificate, is not possible in light of the FAA's determination.

Overall, the FAA determined that:

It is not practical for [the Runway 33L RSA] to meet full standards but it can be improved with a 600 [foot] by 300 [foot] runway safety area with 70 knot EMAS protection for Boeing 747-400, subject to environmental review and approvals. Reductions below 300 feet are unacceptable due to the need for a corridor on either side of the EMAS bed for emergency response and maintenance vehicles to safely maneuver and turn around without risk of driving off and over the water platform.¹⁵

The existing 158-foot long and 170-foot wide EMAS bed (with 60 psi strength EMAS blocks) would be removed and replaced with a new EMAS bed constructed of 80 psi strength EMAS blocks and would have a total length of 500 feet. The EMAS bed would begin 40 feet from the runway's threshold. As stated above, FAA determined that reductions below 300 feet would be unacceptable due to the need for a corridor on either side of the

9 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 6.

10 EOE #14442, ENF Certificate, August 14, 2009, and Draft EIR Certificate, September 29, 2010.

11 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009,

12 United States Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15, December 31, 2009.

13 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 6.

14 *ibid*, p. 5.

15 *ibid*, p. 6.



170-foot wide EMAS bed for emergency response and maintenance vehicles to safely maneuver and turn around without the risk of driving off and over the deck.¹⁶ The additional 3 feet of deck width is required to provide a curb along both sides of the deck to prevent emergency personnel and vehicles from falling over the edge. As part of this alternative and to reduce the need for a larger deck, the existing 20-foot wide airport perimeter road would be relocated between the runway's threshold and the EMAS bed (it is currently located at the end of the existing EMAS bed).

Two emergency access ramps would be installed, one on either side of the RSA, and a floatation device would be provided around the perimeter of the pilings to enhance rescue response. The localizer would be repositioned to the end of the RSA and installed on a 60-foot long and 303-foot wide section of the pile-supported deck that is needed for safe maneuvering.

2.2.3.1 Deck and Pile Configuration Options Screening

The Runway 33L RSA improvements would have an overall length of 600 feet, of which approximately 470 feet would be on a pile-supported deck extending into Boston Harbor. The RSA on the deck would be 300 feet wide, with the landside portion remaining 500 feet wide. Since the ENF, Massport considered various pile types and configurations. These alternate deck structures and piling combinations were evaluated at the conceptual design level to assess costs, minimize impacts, and evaluate constructability. As described below, the overall impacts of the different deck and piling configurations to coastal wetlands resources and coastal processes would be similar.

The Construction Options are still conceptual, and for the purposes of analysis, all six deck and pile options evaluated contain the following project elements:

- A RSA approximately 600 feet long located partially on land and partially on the proposed deck with various pile supporting options (410 feet for RSA plus 60 feet for emergency response/localizer);
- A proposed deck structure approximately 470 feet long and 303 feet wide, with a surface area of approximately 141,000 square feet (3.2 acres);
- The seaward section of the deck to support the localizer and to provide safe and adequate space for emergency response, approximately 303 feet wide by 60 feet long, consisting of:
 - Thirty-three 16-inch diameter vertical piles,
 - Four 16-inch diameter batter piles¹⁷ arranged in 11 bents and 3 rows, and
 - Cast-in-place pile caps with 15-inch thick precast/pre-stressed plank deck and 3-inch thick concrete overlay;
- An EMAS bed approximately 500-feet long by 170-feet wide located within the RSA;
- Two 25-foot wide emergency access ramps, one each located on either side of the proposed deck;

¹⁶ *ibid* .p. 6.

¹⁷ A batter pile is a pile that is driven at an inclination to the vertical pile to provide resistance to horizontal forces.



- A steel sheet pile cutoff wall approximately 350 feet long at the inshore limit of the deck to prevent settlement and erosion of the backland areas;
- A transition slab (25 feet wide) spanning from the land to the pile-supported structure; and
- Finger pier extensions to the existing light pier to accommodate the CAT III ILS, with:
 - Three 5-foot by 40-foot extensions (eight new timber piles),
 - Three 5-foot by 35-foot extensions (six new timber piles), and
 - Two 5-foot by 10-foot extensions (two new timber piles).

Six construction options were developed for the Runway 33L RSA (Figure 2-4 and Figure 2-5), as described in the following sections and Table 2.2-1.

Table 2.2-1 Runway 33L Construction Options

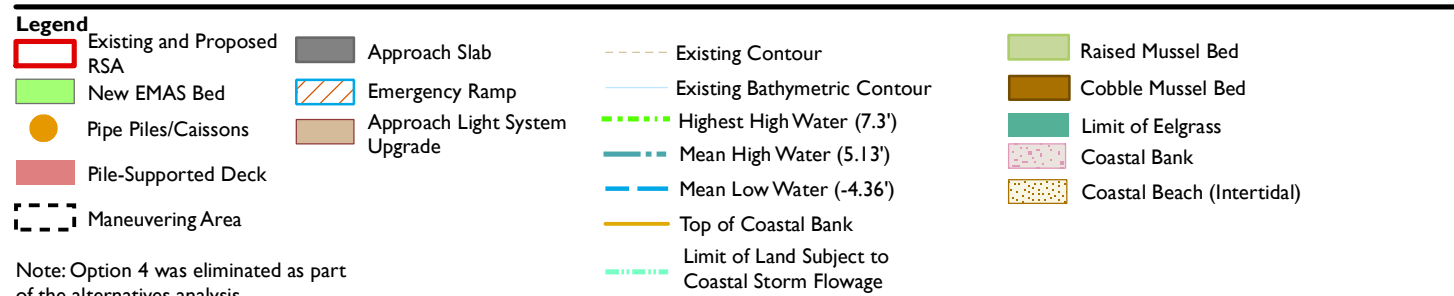
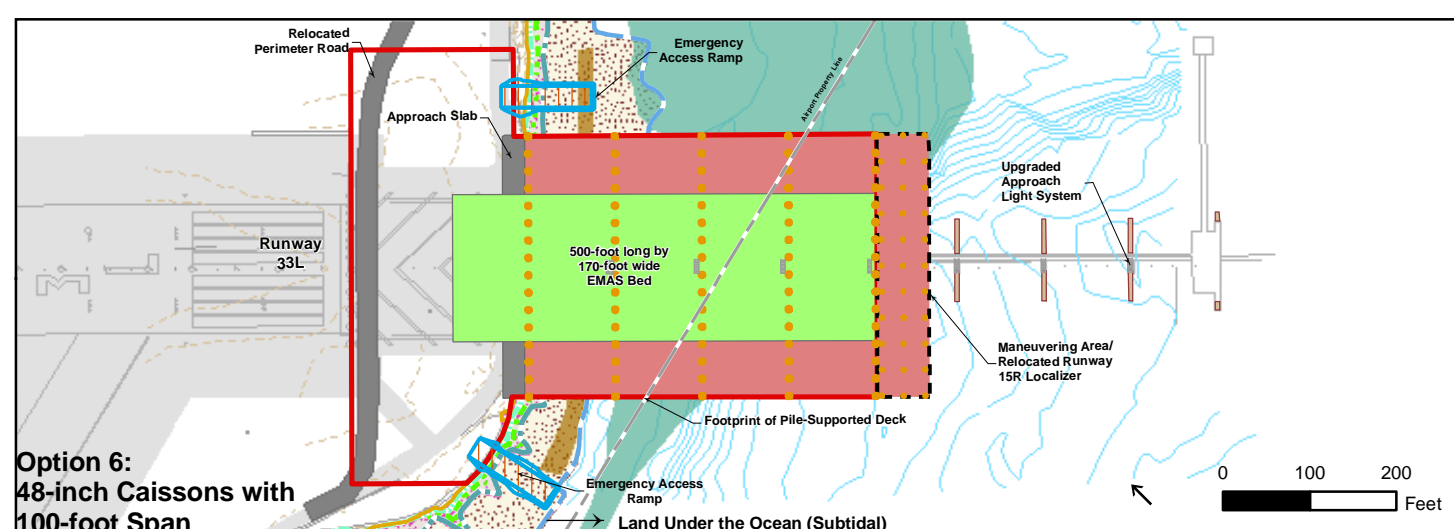
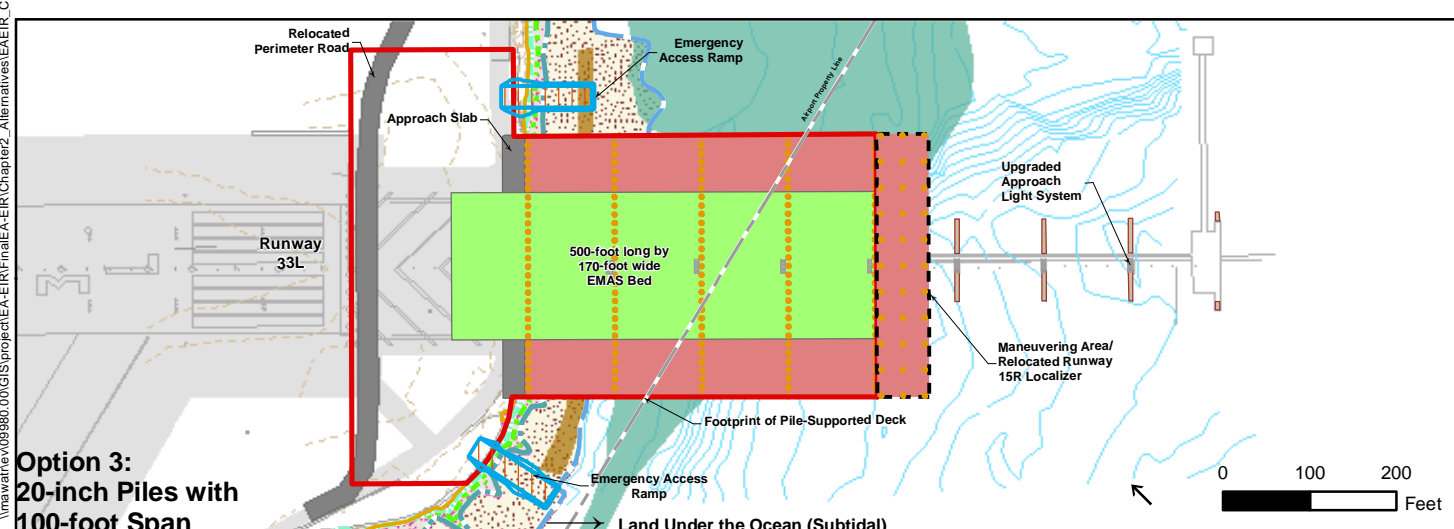
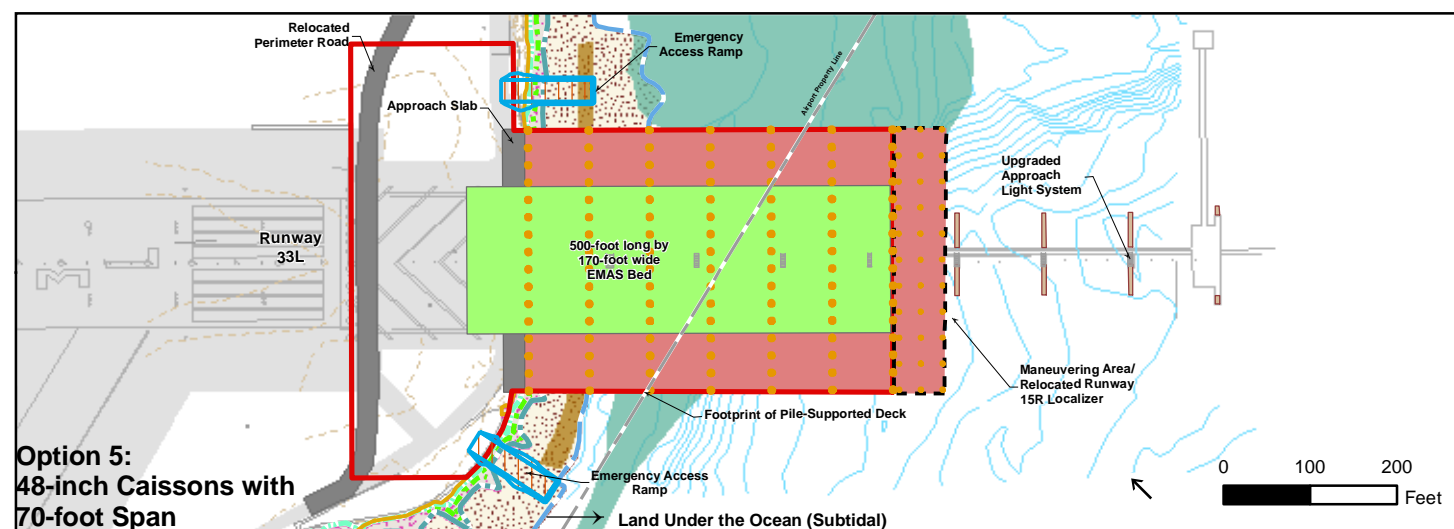
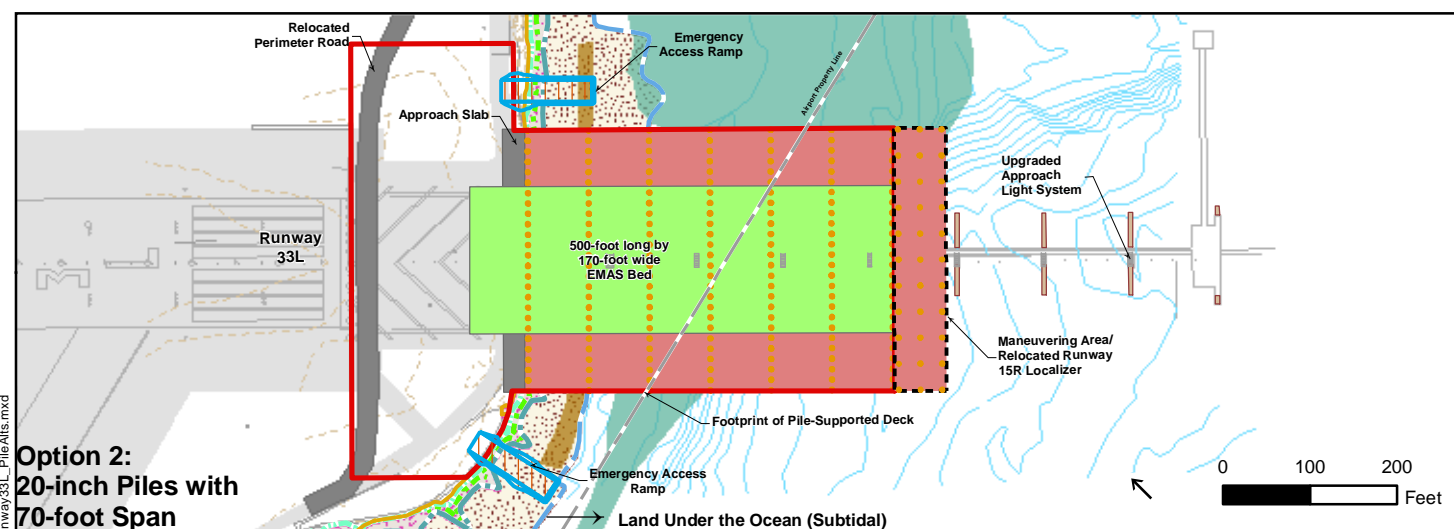
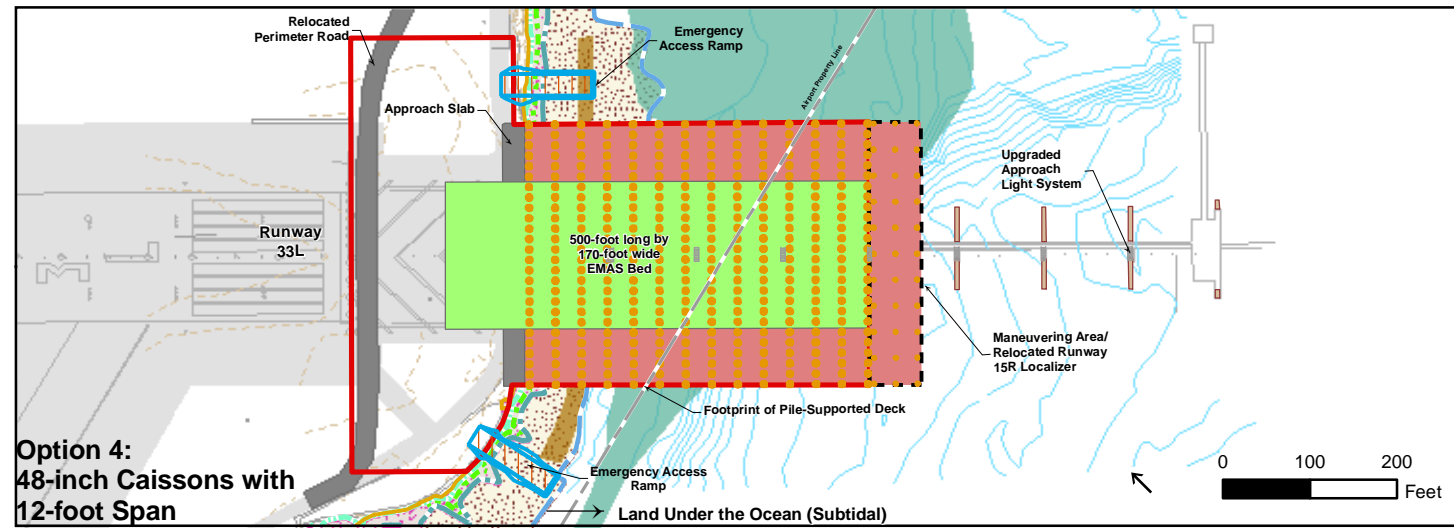
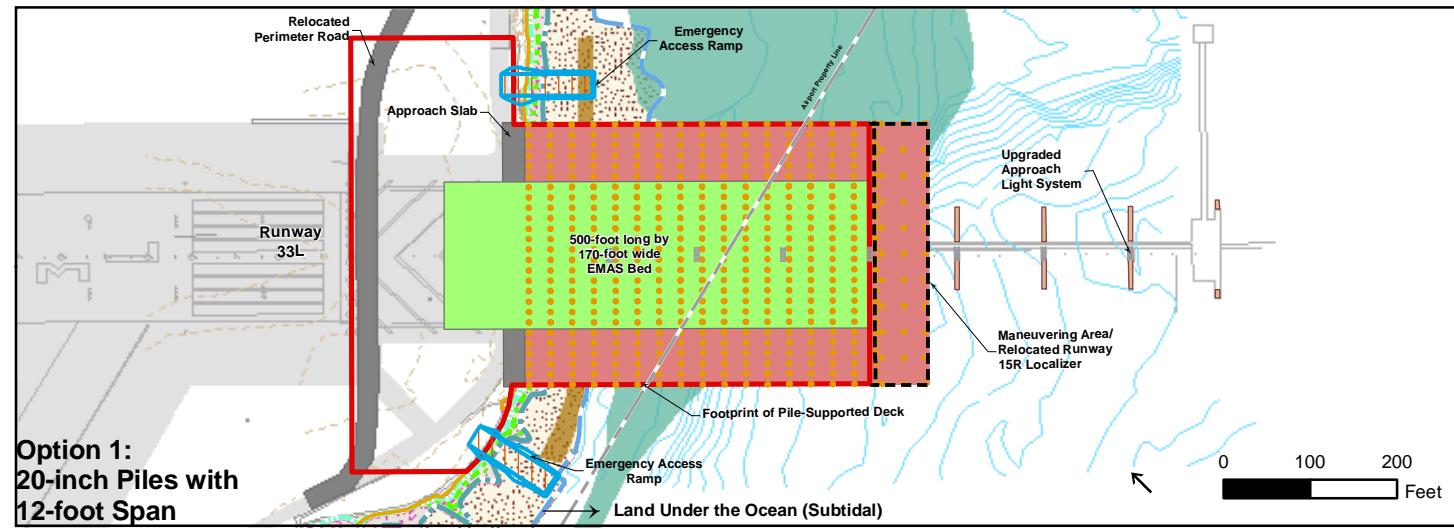
Option	Pile Type	Pile Size (inch diameter)	Pile Number	Batter Piles ¹	Bent Number ²	Bent Spacing (feet)
1	Pipe Pile	20	442	48	26	12
2	Pipe Pile	20	182	48	7	70
3	Pipe Pile	20	155	48	5	100
4	Caisson	48	364	0	26	12
5	Caisson	48	112	0	7	70
6	Caisson	48	80	0	5	100

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

² A pile bent is an array of piles driven in a row and fastened together at the top by a pile cap or bracing.

Due to the imperceptible differences in total scour area and other environmental factors, Options 1, 2, 3, 5, and 6 were carried forward for further analysis in this Draft EA/EIR. Option 4 was eliminated from further analysis for having environmental impacts approximately one order-of-magnitude higher than the other options due to the large number of caissons, the size of the caissons, and the small bent spacing. The Secretary’s Certificate on the Draft EA/EIR indicated that it was acceptable to carry forward to the Final EA/EIR the preferred alternative (600-foot long RSA with EMAS on a Pile-Supported Deck) and the five construction options for further evaluation. The FAA also supports this approach. Massport has not identified a preferred piling and deck construction option at this time. Since there are negligible differences in environmental impacts, Massport’s ultimate decision on the construction methodology will be based on constructability, construction costs, and the potential impacts on the use and operations of Runway 15R-33L during construction. This decision will be made prior to the completion of permitting.

Massport has elected to use a design/build process to construct the Runway 33L RSA improvements. Design/build firms responding to Massport’s request for proposals for the Runway 33L RSA improvements would design the pile-supported deck using one of the construction options identified in this Final EA/EIR and present it to Massport for approval. It is anticipated that the contractor would be selected in March 2011.



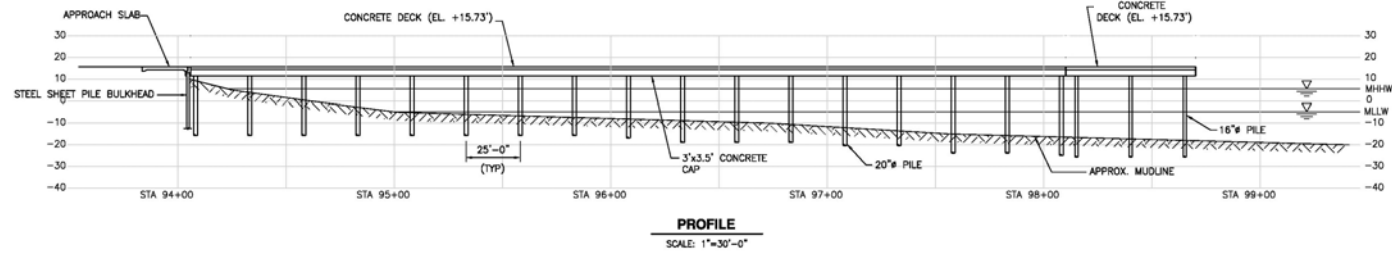
Logan RSA

Figure 2-4
Runway 33L RSA
Construction Options

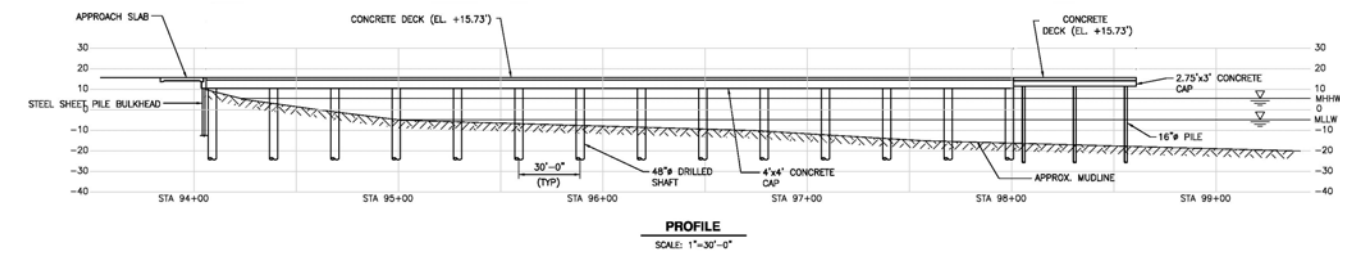
Source: Jacobs Edwards & Kelcey, Inc. Childs Engineering Corps. VHB Fieldwork - 2008; 2010



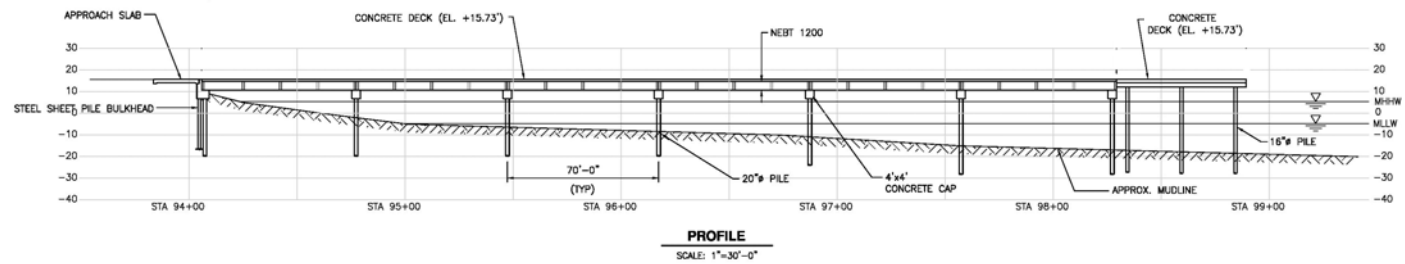
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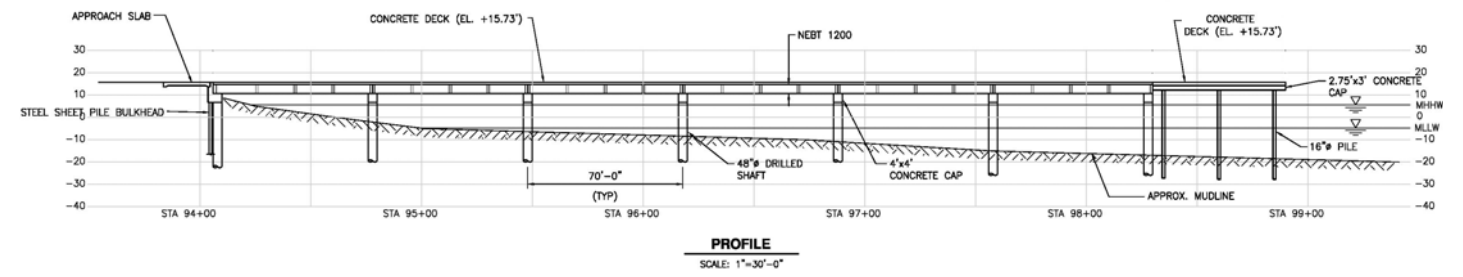
Option 1: 20-inch Piles with 12-foot Span



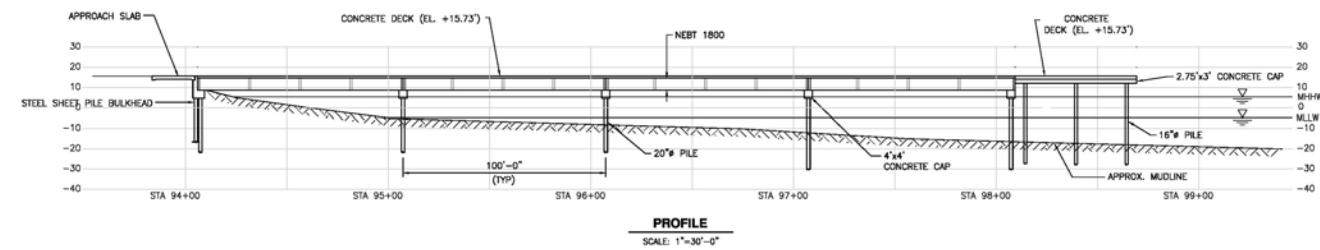
Option 4: 48-inch Caissons with 12-foot Span



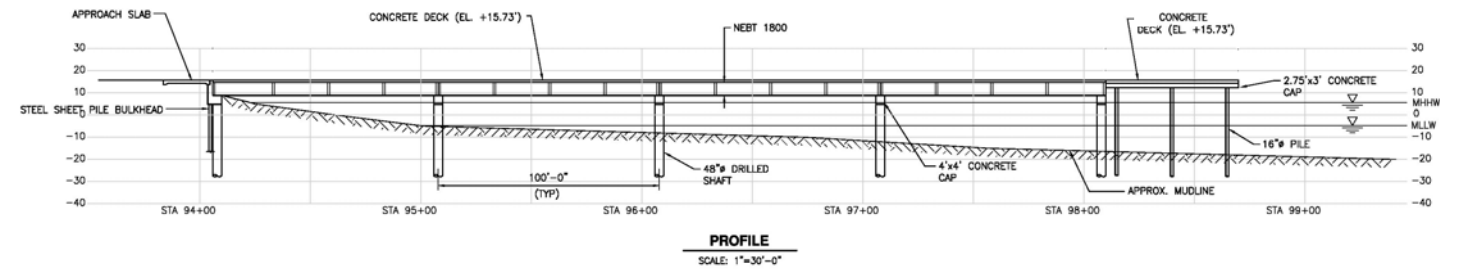
Option 2: 20-inch Piles with 70-foot Span



Option 5: 48-inch Caissons with 70-foot Span



Option 3: 20-inch Piles with 100-foot Span



Option 6: 48-inch Caissons with 100-foot Span

Note: Option 4 was eliminated as part of the alternatives analysis.

Not to Scale



Logan RSA

Figure 2-5

Runway 33L Construction Options Cross Sections

Illustrative purposes only



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2.2.4 Construction

FAA Order 1050.1E, Appendix A, Section 5, requires that the environmental document must include a description of the type and nature of the construction and measures to be taken to minimize adverse effects. A description of the construction process and phasing is provided in this Chapter because it is an essential element of the description of the Proposed Action. This section describes the construction techniques and activities associated with the Runway 33L RSA improvements. Due to environmental and operational constraints, the construction period for the proposed Runway 33L RSA improvements is expected to extend over approximately three years, with periods of inactivity likely during the winter months. The information presented here is based on the preliminary construction plans which have been prepared to date, and it represents the best estimate of construction activities which can be made at this time. When the proposed Runway 33L RSA improvements are in the final design and construction phase, Massport will prepare detailed phasing and construction sequence procedures to ensure continual safe operation of the runways, protection for critical resources, as well as airport roadways, and utilities. Massport is constructing the Runway 33L RSA improvements using a design/build approach. Whether conventional or design/build construction strategies are implemented, it is not anticipated to impact the overall schedule, proposed construction techniques, or environmental impacts. The environmental impacts associated with construction of the proposed Runway 33L RSA improvements are addressed in Chapter 4, *Environmental Consequences*.

2.2.4.1 Construction Techniques and Activities

This section provides a description of the elements of the Proposed Action at a concept level, and how these elements were assumed to be constructed.

Upland Work

Work in upland portions of the project area includes relocating the existing perimeter road, constructing a new taxiway connector (Taxiway C1 connector) west of Taxiway C, relocating utilities, and installing a concrete approach slab between the upland and the deck (Figure 2-6).

Sheet Pile and Riprap

The existing riprap slope between the perimeter road and the intertidal areas would be replaced with a filled sheet-pile structure protected with riprap.

Emergency Ramps

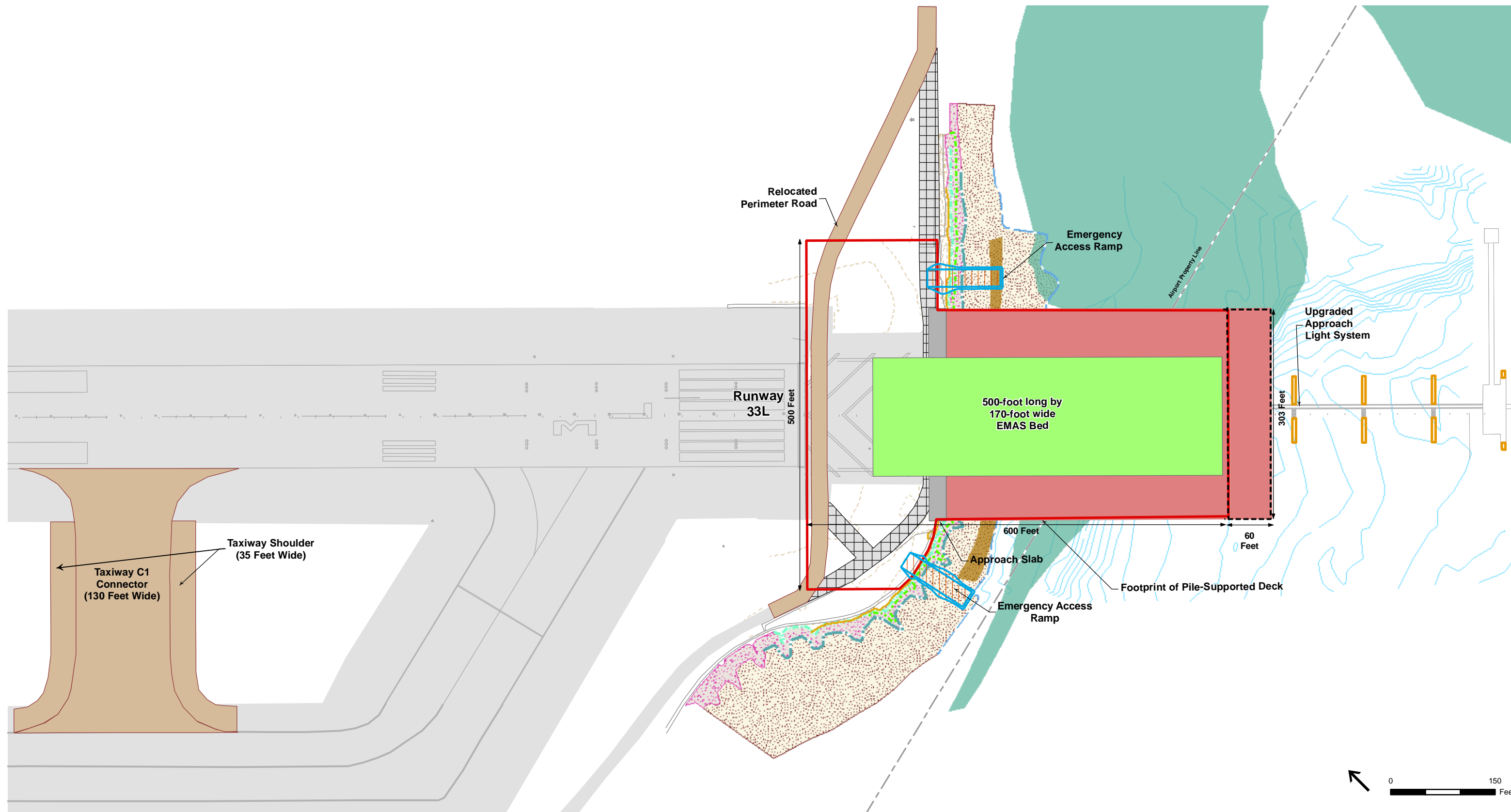
For construction of the emergency ramps, the existing riprap slope would be removed, graded, and replaced with material that would be used to provide a safe surface for emergency responders and others in the emergency situation. The edge of the ramps would be reinforced with riprap.

Pile/Caisson Installation

Construction Options 1, 2, and 3 assumed use of 20-inch steel piles that would be set with a vibratory hammer and then driven to capacity with an impact hammer. The piles would be aligned in position using a template. The template would consist of two H-piles vibrated 20 feet into the bottom every 20 feet along the pile bents with a steel framework welded to the piles. Once the production piles are in place, the framework would be disassembled and the H-pile template would be extracted using a vibratory hammer. All work would be done from a barge.



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Legend			
	New EMAS Bed		Existing Contour
	Proposed and Existing RSA		Existing Bathymetric Contour
	Pile-Supported Deck		Highest High Water (7.3')
	Approach Slab		Mean High Water (5.13')
	Emergency Ramp		Mean Low Water (-4.36')
	Maneuvering Area		Top of Coastal Bank
	Footprint of Pile-Supported Light Pier Extensions		Limit of Land Subject to Coastal Storm Flowage
	Demolished Pavement		Raised Mussel Bed
	Taxiway C1 and Relocated Perimeter Road		Cobble Mussel Bed
	Existing Paved Surfaces		Limit of Eelgrass
			Coastal Bank
			Coastal Beach (Intertidal)

Logan RSA
Figure 2-6
Taxiway C1 Connector and Relocated Perimeter Road

Source: Jacobs Edwards & Kelcey, Inc. Childs Engineering Corps.



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The analysis assumed that 48-inch caissons in Construction Options 5 and 6 would be installed using a steel pipe casing with a vibratory hammer operated from a barge-mounted crane. Once the casing is set to a specific elevation, a drilling rig would be brought in on a separate barge. The drill or auger would excavate the inside of the casing down through the clay and into the rock below. This process would remove sediment from the inside of the casing and place the material on the deck of a barge. This sediment would then be moved to a deck barge using a loader and scale pan for disposal off site at an approved facility. Excavate would be tested at a transfer location at the selected contractor's yard and disposed of according to Massport procedures and/or any permit conditions. As the concrete is pumped in, the drilling fluid would be displaced up and out of the steel casing. The drilling fluid would be collected and filtered/de-sanded for reuse on the next caisson.

Typically the barges used to support the pile driving and drilling operations would be 45 feet wide by 150 feet long. The equipment would include 150-ton to 250-ton cranes depending on the operation. The barges would be supported by spuds (vertical steel shafts that hold the barge in place and at a constant elevation). Material barges would also be 45 feet wide and 150 feet long. It is assumed that a maximum of three spud barges would be required on site each day with two movements per day for repositioning and the initial mobilization and demobilization for each barge. The spuds would not be vibrated into the bottom; rather they would be set by dropping through the spud wells (gravity) to approximately 5 to 10 feet deep. The temporary environmental impacts associated with barge use are addressed in Chapter 4, *Environmental Consequences*.

Pile/Caisson Caps Installation

When pile driving/caisson installation has sufficiently progressed to complete one bent, a reinforced concrete cap would be installed over those piles or caissons. The concrete cap would be formed using steel forms designed to span between the piles. Rebar would be installed with support from a barge-mounted crane. Forms and rebar would be delivered via barge. Concrete would be pumped into the forms via pumps from shore. Work would be supported by a barge mounted crane.

Bulb Tee Deck Construction

The long span (70 or 100 feet) New England Bulb Tee girders would be manufactured off-site at an approved precast concrete plant. The girders would be transported to the contractors staging site by barge or truck. The girders would then be placed on a transport barge (or if delivered by barge) would be towed to the project site for installation. To place the 100-foot long girders over the first span, a large 300-ton crane would likely be required.

Existing Light Pier Demolition

Prior to the installation of the concrete deck plank, the portion of the light pier within the deck footprint would be selectively demolished, and a temporary lighting system installed.

Precast Plank Erection

For Options 2, 3, 5 and 6, precast concrete planks would be manufactured off site. The planks would be delivered to the contractor's staging area via truck or barge. The planks would then be loaded onto barges and transported to the project site. A barge-mounted crane would hoist the planks into position on top of the pile



caps. Following installation, a poured concrete deck overlay would be constructed starting from the shore and moving out toward the water.

2.2.4.2 Construction Sequencing and Phasing

This section describes the assumed logistics, phasing, and duration of the construction of the proposed Runway 33L RSA improvements.

Logistics

The proposed Runway 33L RSA improvements are located within the secure airfield area at the southeasterly end of Runway 33L and would primarily be an overwater structure with minimal upland construction activity. Construction would generally be performed from floating, barge-mounted equipment which has the additional benefit of mobility in the event of Logan Airport operations requiring the approach to Runway 33L to be cleared. Because of the large quantity and size of construction materials involved, a water-based transportation system of barges and tugs is expected to be utilized to bring the bulk of materials (with the exception of poured concrete and EMAS blocks) to the site in order to minimize impact on airfield operations and allow for timely delivery and stockpiling. The water transportation staging area would be at the contractor's yard and would most likely be located in Quincy, East Boston, or Charlestown. Personnel would primarily be transported by watercraft to and from the construction site. Landside access would primarily be restricted to management, safety, quality assurance and maintenance personnel. Concrete materials, asphalt, and the EMAS blocks would arrive by truck via the South Boston By-pass Road and/or Route 1A. Trucks and barges entering the Airport would follow the standard Logan Airport escort procedures.

Overnight barges would be moored near Logan Airport but outside of runway protection zones. With prior authorization and inspection, barges can be inside or outside of the Airport Security Zone as long as there are no penetrations into the runway protection zone (RPZ). A layover anchorage outside the Airport Security Zone would be identified. The southwestern side of the existing light pier is the current proposed mooring location. Anchorage would occur using a low impact anchor such as a pile-driven anchor. The depth of water would likely be 20 feet or greater. A chain would be attached to the anchor pile and attached to a mooring buoy used to moor the barges. A weighted anchor could be used in lieu of a pile type anchor to minimize impacts to the ocean floor. There are no eelgrass beds in this area.

Construction Phasing

Several factors have guided the proposed construction phasing. Two critical factors are marine resource-based time of year restrictions and runway use. The following section discusses how these issues have informed construction phasing.

A number of the federal and state resource protection agencies have identified times of year that are critical to species lifecycles, including times when adverse impacts should be avoided. The Massachusetts Division of Marine Fisheries (DMF) has recommended a time-of-year restriction related to winter flounder that extends from February 15th through June 30th. As noted in its comment letter on the ENF, during this annual window in-water projects are precluded from silt-producing work. These restrictions do not entirely preclude in-water



work at these times, but such work cannot affect the resource areas. These time-of-year windows were the critical natural resource considerations.

Runway use at Logan Airport is in response to wind and weather conditions. Any proposed construction associated with a runway may have to stop and start due to weather and runway use requirements. Logan Airport relies on Runway 15R-33L primarily between November and March to accommodate the historic wind direction patterns during that time of year. In addition, Runway 15R needs to be available at night throughout the year. Based on the DMF recommended time-of-year restriction noted above, the pile-driving operation can be done from July 1st through February 14th. For the purposes of this document it is anticipated this operation would be conducted between July 1st and November 30th during 2011, 2012, and 2013. However, actual pile-driving operations could be extended beyond November should wind/weather permit, but would likely be completed in one to two construction seasons. On-site work would occur seven days per week between the hours of 7 AM and 7 PM.¹⁸ Weekend work would start at 9 AM and end at 6 PM.

A three-season construction schedule is proposed that would account for operational and runway restrictions and ensure that Massport meets the FAA schedule for having safety improvements constructed by the end of 2013. As previously discussed, in November 2005, Congress mandated that all commercial passenger airports improve their RSAs by 2015. The Department of Transportation's Office of the Inspector General reported in 2009 that Logan was one of the 11 of the nation's largest airports needing to improve RSAs. The report noted that "critical RSA improvements need to be made sooner rather than later to lower the risk of passenger injuries and aircraft damage in the event of runway accidents." To achieve this goal, FAA's current Capital Improvement Program for the New England Region has allocated funding for the Logan Airport RSA project beginning 2011. For the purposes of this analysis, the construction generally would be completed in four phases over three construction seasons:

- Phase 1 – construct the perimeter road, Taxiway C1 Connector, install riprap, sheet pile, and the first pile bent;¹⁹
- Phase 2 – waterside work including any remaining piles, pile caps, and the entire deck structure;
- Phase 3 – construct the localizer pier extension and light pier improvements, and,
- Phase 4 – install the EMAS bed.²⁰

This is a conservative estimate, for purposes of evaluating the maximum construction-period traffic, air emissions, and noise. If construction were extended over a full 12-month period, the peak daily impacts for these resources would be reduced.

2.2.4.3 Construction Costs

Estimated costs for the proposed Runway 33L RSA improvements construction options range between \$50 million and \$60 million for the pile-supported deck structure, depending on the foundation option

¹⁸ In accordance with the City of Boston Noise Ordinance.

¹⁹ Perimeter Road relocation, Taxiway C1 Connector, riprap and sheet pile installation would not generate sediment and could occur before July 1.

²⁰ Deck construction would not generate sediment and could occur before July 1.



(Table 2.2-2). The cost of constructing the Taxiway C1 Connector, the localizer relocation, and the approach light upgrade is approximately \$14 million. Although Option 1 includes the smallest deck support structure, it would be the most expensive to construct because it includes the largest number of 20-inch diameter piles. Options 2, 3, and 6, would all cost approximately the same, while Option 5 would be slightly more expensive since it would require the greatest number of caissons.

Table 2.2-2 Runway 33L Proposed Action: Estimated Construction Costs

Element	Construction Cost Estimate	Design and Construction Phase Services	Construction Contingency	Total Estimated Cost
Highest RSA Cost Option (Option 1)	\$45 million	\$6 million	\$9 million	\$60 million
Lowest RSA Cost Option (Option 2)	\$38 million	\$5 million	\$7 million	\$50 million
Taxiway C1 Connector, Localizer, and Approach Light Upgrade (common to all options)	\$11 million	\$1 million	\$2 million	\$14 million

2.3 Runway 22R

This section summarizes the alternatives considered for the Runway 22R RSA improvements, including a description of the Proposed Action, construction methods, and project costs. The Secretary’s Certificate on the ENF directed Massport to evaluate the Inclined Safety Area and the No-Action/No-Build alternatives for Runway 22R. The Inclined Safety Area was evaluated in the Draft EA/EIR, and the Secretary’s Certificate on the Draft EA/EIR indicated that Massport may carry the Inclined Safety Area forward for further analysis in this Final EA/EIR. The FAA also supports this approach. The Secretary’s Certificate on the Draft EA/EIR required that Massport continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree possible.

2.3.1 Description and Use of Runway 22R

At 7,860 feet, Runway 4L-22R is the third longest at Logan Airport. As shown on Figure 1-1, the Runway 22R end is at the northern end of the airfield, and the Runway 4L end is at the southern end. Runway 22R has an 815-foot displaced threshold, which reduces the length of runway available for arrivals. The threshold for Runway 22R is displaced because of obstructions (buildings) in the Orient Heights section of East Boston. The paved area behind the threshold is available for departures and roll-out for Runway 4L arrivals.

Runway 22R is used primarily for aircraft departures to the south, while Runway 4L is used primarily for aircraft arrivals from the south. In 2009, Runway 22R accommodated 34 percent of all jet aircraft departures,



while the opposite end of the runway, Runway 4L, accommodated 7 percent of all jet aircraft arrivals.²¹ Runway 4L-22R accommodates a number of different aircraft including turboprops and heavy, light, and regional jets, and is designed to handle heavy commercial jet aircraft. In 2009, Runway 4L-22R was used most frequently for arrivals by turboprops and regional jets but was used by a number of different aircraft including turboprops and heavy, light, and regional jets for departures.

Historically this runway has very rarely been used for arrivals. As mentioned above, Runway 22R's arrival threshold is displaced 815 feet from the actual end of the pavement. While this 815-foot displacement area is available for Runway 4L arrival roll-out, and Runway 22R departures, it is not available for Runway 22R arrivals. According to the FAA, the displacement area can be used to satisfy undershoot requirements for any Runway 22R arrivals. The remaining requirement for vertical guidance has been satisfied through the installation of a PAPI. Therefore, the Runway 22R RSA is intended to protect aircraft in the event that an aircraft arriving on Runway 4L overruns and fails to stop on the runway. Runway 4L currently has a 1,000-foot long RSA.

The existing RSA for Runway 22R is 215 feet long and 500 feet wide (Figure 2-7). The level of safety provided by the existing RSA with EMAS was the maximum possible without extending the RSA beyond the existing limit of pavement. The existing EMAS configuration, however, does not provide the opportunity for the design aircraft to safely transition in the event the aircraft exits the EMAS bed and enters the harbor, and does not provide emergency vehicles easy or safe access to/from the water. The 190-foot long and 170-foot wide EMAS bed for aircraft overrun protection was constructed in 2005. The EMAS bed is set back 5 feet from the runway threshold and meets design standards for EMAS use as described in the FAA's Airport Design Advisory Circular;²² the EMAS bed in its current configuration provides the minimum FAA-defined arrestment speed of 40 knots for the design aircraft (Boeing 757-200). The EMAS bed is designed to stop the design aircraft if it is traveling at speeds of 40 knots or less when it leaves the end of the runway. The arresting performance of the Runway 22R EMAS bed improves with lighter aircraft, particularly for many of the smaller aircraft (smaller than the design aircraft) frequently using this runway. For example, the EMAS bed would arrest a Boeing 737-800 that leaves the runway at 51 to 57 knots and a CRJ-200 that leaves the runway at 60 to 66 knots.²³

The existing airport perimeter road is located at the northern edge of the existing EMAS bed, within the RSA. One navaid, a PAPI, is located at the Runway 22R end.

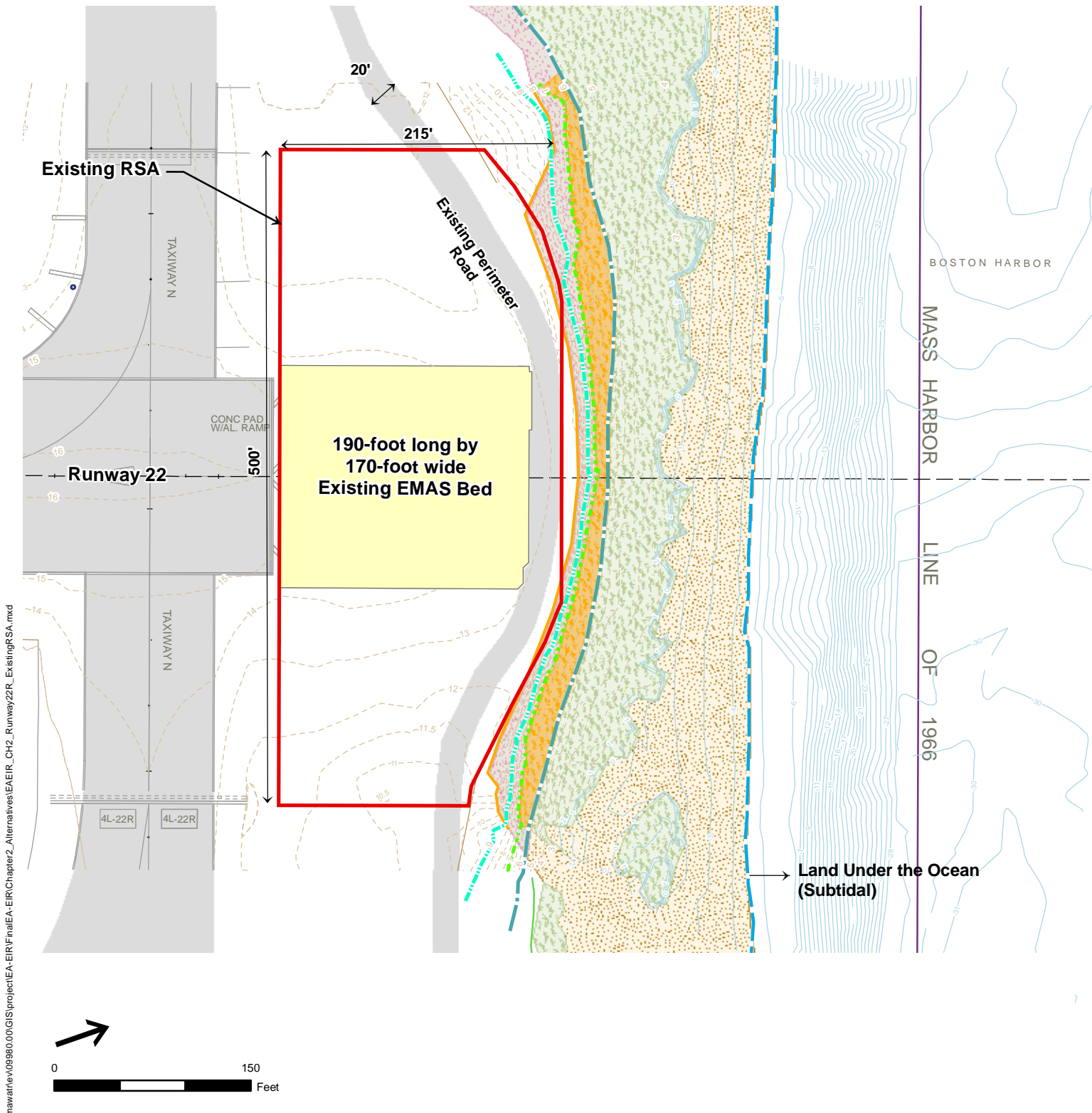
2.3.2 Runway Safety Enhancement Alternatives for Runway 22R

This section summarizes the process undertaken by Massport and FAA to identify reasonable alternatives for enhancing the Runway 22R RSA. FAA required Massport to investigate options to further enhance safety at this runway end. It was determined that Runway 22R does not provide a sufficient overrun area for landings on Runway 4L approach for Category C and D aircraft. The FAA Runway Safety Area Determination directed

21 Massachusetts Port Authority, *Boston-Logan International Airport 2009 Environmental Data Report*, September 2010.

22 United States Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15, December 31, 2009.

23 SH & E, Inc, Edwards and Kelcey, Inc., Flight Transportation Associates, Inc., *Runway 4L/22R Safety Area Analysis*, March 29, 2004, p. 16.



\\mawait\ev09980\00\GIS\project\EA-EIR\Final\EA-EIR\Chapter2_Alternatives\EAER_CH2_Runway22R_ExistingRSA.mxd

Legend

- Existing RSA
- Existing EMAS Bed
- Coastal Bank
- Coastal Beach (Intertidal)
- Salt Marsh
- Phragmites-dominated Salt Marsh
- Existing Contour
- Existing Bathymetric Contour
- Highest High Water (7.3')
- Mean High Water (5.13')
- Mean Low Water (-4.36')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage



Logan RSA

Figure 2-7

Existing Runway 22R RSA

Source: Jacobs Edwards & Kelcey, Inc.
Childs Engineering Corps.
Office of Geographic and Environmental Information
(2004, 2006 MassGIS)



Massport to pursue additional improvements beyond the existing EMAS bed including a longer EMAS bed, an Inclined Safety Area (ISA), or other RSA enhancement options that may be subsequently identified.^{24,25}

Massport conducted an RSA feasibility analysis for the Runway 22R end. The results of that analysis combined with the FAA review and determination approved the placement of a 190-foot long EMAS bed that meets minimum standards, with the requirement of follow-on work to determine additional practical actions that could further enhance safety. As part of this RSA study, the technical team reviewed the operational use of Runway 4L-22R and possible options to further enhance the safety area, environmental impacts, and related costs.

Based on this analysis, Massport developed four alternatives and sub-options for the Runway 22R RSA which were evaluated in the ENF. The alternatives included EMAS enhancement on solid fill, EMAS enhancement on a pile-support deck, replacing the existing EMAS bed, and the ISA installation. Both the solid fill and deck structures were eliminated from further consideration because they were not considered financially feasible by the FAA as an option for further enhancing the level of safety provided by the existing RSA. Each of these options would have required building a solid fill or deck structure extending from 115 to nearly 400 feet into the approximately 1,500-foot channel between Logan Airport and the East Boston (Bayswater Street) shore. These structures would reduce the width of the navigation channel due to the length of the structure and the associated Logan Airport security zone. Replacing the EMAS bed was rejected because it would not meet the safety objectives of the project. The ISA (Figure 2-8) was carried forward in the Draft EA/EIR, as directed in the Secretary's Certificate on the ENF, which confirmed that all other alternatives examined are infeasible due to cost or unacceptable environmental impacts.

2.3.3 Proposed Action

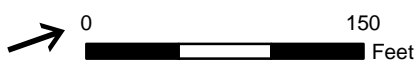
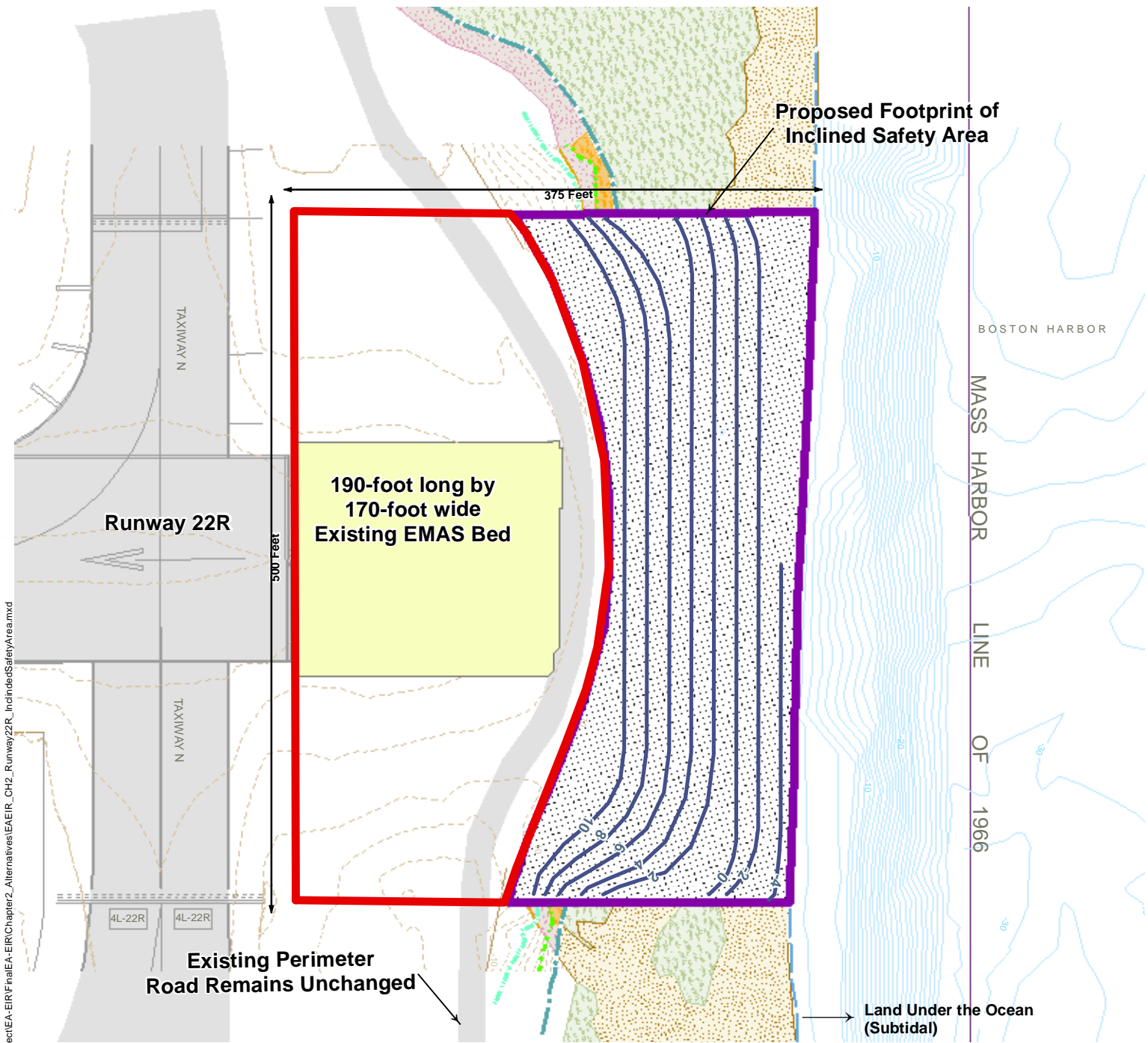
The Runway 22R Alternative 4 - Inclined Safety Area would enhance the existing RSA by constructing an ISA at the end of Runway 22R. This alternative was advanced to the conceptual design phase because it would enhance the existing RSA and rescue access in the event of an emergency, at a construction cost which appears to be reasonable.

The Secretary's Certificate on the ENF stated that the alternatives that should be carried forward to the Draft EA/EIR and analyzed are the ISA and the No-Action/No-Build Alternative for Runway 22R. The No-Action/No-Build Alternative assumes that Runway 22R enhancements would not occur and routine maintenance at the airport would continue. Other airport projects occurring in the same timeframe of the RSA improvements are assessed under cumulative impacts. The Certificate on the Draft EA/EIR indicated that the ISA may be carried forward for further evaluation in this Final EA/EIR.

The proposed Runway 22R ISA would not increase the arrestment speed of the existing 60 psi strength EMAS bed, which meets the current minimum FAA Design Standards for overrun protection for the design aircraft (Boeing 757-200), but would provide a smoother transition into the water for any aircraft that exits the runway

²⁴ SH&E, Inc. and Flight Transportation Associates, Inc., Runway 4L/22R Safety Area Analysis, March 29, 2004.

²⁵ Federal Aviation Administration, Runway Safety Area Determination: General Edward Lawrence Logan International Airport East Boston, Massachusetts, June 6, 2004, p. 1.



Legend

- Existing EMAS Bed
- RSA
- Inclined Safety Area
- Proposed Contour
- Existing Contour
- Existing Bathymetric Contour
- Highest High Water (7.3')
- Mean High Water (5.13')
- Mean Low Water (-4.36')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage

- Coastal Bank
- Coastal Beach (Intertidal)
- Salt Marsh
- Phragmites-dominated Salt Marsh



Figure 2-8
Runway 22R
Proposed Inclined Safety Area

Source: Jacobs Edwards & Kelcey, Inc.
 Childs Engineering Corps.
 Massport - Bathymetric Contours

\\mawait\ev09980\00\GIS\project\EA-EIR\Final\EA-EIR\Chapter2_Alternatives\EAIR_CH2_Runway22R_InclinedSafetyArea.mxd



at a speed greater than 40 knots. There is a substantial elevation change and slope gradient from the end of the existing EMAS bed down to the mean low water elevation. The ISA would re-grade this area to provide a more constant slope in the event that the aircraft exited the EMAS bed and entered the water, and would reduce the potential for loss of life and damage to any aircraft that fails to stop within the existing EMAS bed. It would also significantly enhance access by rescue personnel as well as egress by passengers.

The proposed Runway 22R ISA would be similar to the ISA previously constructed at the Runway 22L end. It would require gravel fill to be placed approximately 130 feet north from the top of Coastal Bank and would be graded over the full width of the safety area down to the mean lower low water elevation.²⁶ The proposed Runway 22R ISA would include placing approximately 6,750 cubic yards of fill, contained within a perimeter barrier of stone-filled gabions located below grade and surfaced with crushed stone. Emergency access ramps would not be required because the ISA would provide first responders with access between the water and the airfield. The perimeter road would not be relocated. Figure 2-8 and Figure 2-9 show the proposed Runway 22R ISA. The proposed Runway 22R ISA construction would take place fully within the Logan Airport Boundary.

The Secretary's Certificate on the Draft EA/EIR required that Massport evaluate whether impacts of the Runway 22R ISA could be minimized by design modifications. The ISA cannot be constructed on pilings because it would not be financially feasible and would not reduce impacts to salt marsh, which would be adversely impacted and lost due to shading. Two minimization options were evaluated during preparation of the Draft EA/EIR, as described below.

- Reduce the width of the ISA from 500 feet to 300 feet. This was evaluated but rejected as being incompatible with the safety objectives of the proposed Runway 22R ISA. The existing RSA at the Runway 22R end is 500 feet wide. This provides a safe width to allow aircraft that leave the runway to come to a stop. The ISA needs to be the same width as the RSA so that aircraft, should they leave the runway and miss the existing 170-foot wide EMAS bed, can safely transition into the water.
- Reduce the length of the fill from the proposed approximately 130 feet. The proposed ISA provides a 12.3 percent slope from the existing RSA to the water. A steeper slope of the ISA would not be consistent with the safety objectives of the proposed Runway 22R ISA, since reducing the length of the fill would increase the risk of damage to an aircraft, and would be too steep for emergency response personnel or vehicles to reach an aircraft on the ISA or in the water.

Further minimization is not reasonable in light of the project purpose. The width of the ISA cannot be reduced further. Any width reduction is insufficient to meet the safety objectives of the proposed project. A steeper (shorter) slope of the ISA would not be consistent with the safety objectives of the proposed project, since reducing the length of the fill would increase the risk of damage to an aircraft.

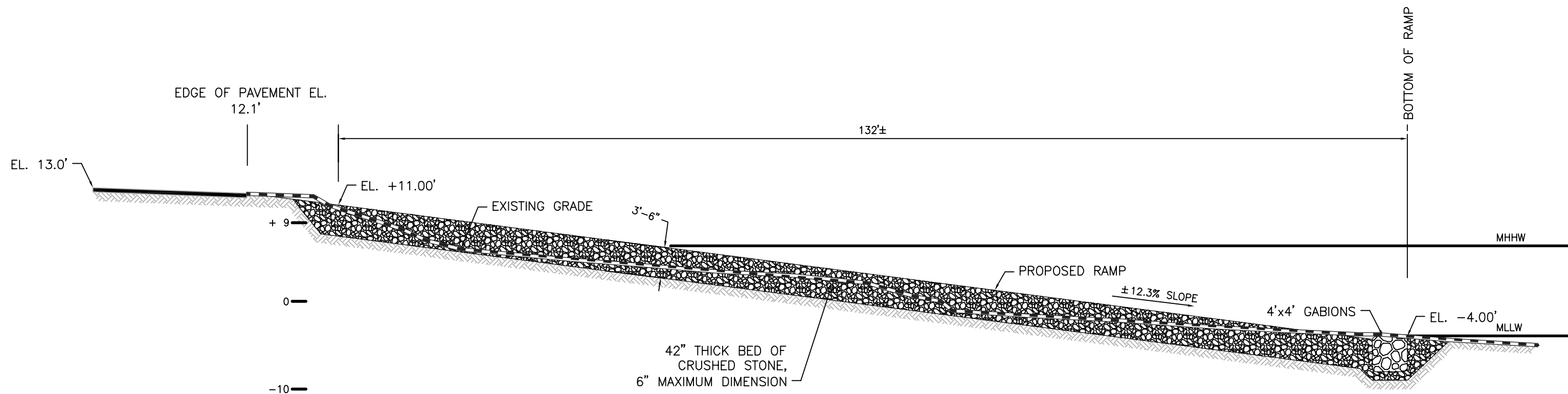
2.3.4 Construction

The FAA's NEPA regulations, at FAA *Order 1050.1E, Appendix A, Section 5*, requires that the environmental document must include a description of the type and nature of the construction and measures to be taken to

²⁶ Mean Lower Low Water (MLLW) = the average daily lower low water level of the tide at a location. Some locations have diurnal tides--one high tide and one low tide per day. At most locations, there are semidiurnal tides--the tide cycles through a high and low twice each day, with one of the two high tides being higher than the other and one of the two low tides being lower than the other.



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Logan RSA

Figure 2-9

Runway 22R Inclined Safety Area Cross Section

Not to Scale

Illustrative purposes only



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minimize adverse effects. This section describes the construction techniques and activities associated with the construction of the proposed Runway 22R ISA. The information presented here is based on the preliminary construction plans which have been prepared to date, and it represents the best estimate of construction activities which can be made at this time. When the proposed Runway 22R ISA is in the final design and construction phase, Massport will prepare detailed phasing and construction sequence procedures to ensure continual safe operation of the runways, as well as airport roadways, and utilities, as was successfully done for the Runway 22L ISA.

2.3.4.1 Construction Techniques and Activities

The construction methodology includes the following steps:

- Excavate a trench around the perimeter of the proposed Runway 22R ISA to hold stone-filled gabions (stone filled baskets used to stabilize soil and prevent erosion);
- Install gabions in the trench to serve as a barrier around the excavation with filter fabric on the inside of the gabion structure to minimize the dispersion of sediment;
- Excavate and grade the interior of the ISA, once the gabions are in place;
- Place clean stone fill and compact.

The work would occur partly within the intertidal zone, thereby subjecting the materials to wave action. During excavation/dredging it is likely that the contractor would work with the tides such that there is no underwater excavation. Dredging is expected to occur using an excavator and small crane from the upland to avoid the need for equipment in the water. Appropriate sedimentation controls would be installed prior to construction.

Soils at Runway 22R would be pre-characterized to determine the material make-up. Based on these results, soils would be excavated out of the intertidal area and placed in trucks for transport to either a Massport-approved disposal facility or Logan Airport's Central Testing Area (CTA) for testing per standard operating procedure before being trucked off-site. This process avoids the need to first stockpile all material at the runway end and then truck all material to the CTA for testing.

All construction materials would likely be transported by truck to the site. Because of the nature and location of the work area, it is not feasible to transport material by barge. Massport will evaluate whether barging could be used to bring stone and/or stone gabions to the site.

2.3.4.2 Construction Phasing

The construction period for the Runway 22R ISA would extend over approximately one construction season (July through November). The proposed Runway 22R ISA would be likely completed after substantial completion of the Runway 33L RSA enhancements and not commence before 2013. Scheduling the construction would depend on closures to Runway 15R-33L for resurfacing (a separate project), as these runways cannot be closed simultaneously. Construction of the proposed Runway 22R ISA would not occur at night due to the project's proximity to the Orient Heights and Bayswater Street neighborhoods in East Boston.



2.3.4.3 Construction Costs

The cost to construct the ISA is estimated to be \$1.4 million, as shown in Table 2.3-1. The cost estimate does not include the cost of salt marsh mitigation. The cost estimate is below the FAA’s maximum feasibility cost for RSA improvement (\$8 million with an EMAS bed having a 40-knot arrestment speed),²⁷ even when combined with the actual cost of the EMAS bed already installed at the Runway 22R end (\$3.4 million).

Table 2.3-1 Runway 22R Proposed Action: Estimated Construction Costs

	Construction Cost Estimate	Design and Construction Phase Services	Construction Contingency	Total Estimated Cost
ISA Structure	\$1.1 million	\$132,000	\$211,000	\$1.4 million

2.4 Summary

This section summarizes the alternatives analysis and description of the Proposed Action for each RSA. The environmental impacts of each Proposed Action are described in Chapter 4, *Environmental Consequences*, of this Final EA/EIR, and Chapter 5, *Proposed Mitigation and Section 61 Findings*, presents the proposed mitigation measures and draft Section 61 Findings.

2.4.1 Runway 33L

The proposed Runway 33L RSA improvements include constructing a 600-foot long RSA at the Runway 33L end, with an EMAS bed on a 303-foot wide pile-supported deck. The proposed Runway 33L RSA improvements would include relocating the perimeter road, constructing Taxiway C1 connector, relocating the localizer to the maneuvering area at the end of the new deck, and upgrading the approach light system. Five construction options have been identified, which vary in the size (20-inch versus 48-inch diameter) of the pilings, the type of pilings (steel versus drilled caissons), the number of pilings (ranging from 80 to 442), and the type of deck support (cast-in-place versus 70- to 100-foot long precast girders). These construction options would have negligible differences in their environmental impacts, but would range in cost from approximately \$50 to \$60 million. The preferred construction option would be selected during the design/build process being undertaken by Massport for construction of the Runway 33L RSA improvements. The preferred construction option is anticipated to be selected in mid-March 2011.

Construction of any of these options is anticipated to require three construction seasons, from July 1st through approximately the end of November during 2011, 2012, and 2013. Actual pile-driving operations could be extended beyond November should the wind and weather permit, and would likely be completed in one to two construction seasons. The duration of the construction season was identified to avoid the most sensitive period

²⁷ FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Materials Arresting System*. March 15, 2004.



for fisheries, particularly winter flounder, and an acknowledgement of Runway 15R-33L usage at Logan Airport. Massport anticipates that most of the construction materials and personnel would be transported by barge and that construction equipment would operate from barges.

As documented in Chapter 4, *Environmental Consequences*, since there are negligible differences in environmental impacts, Massport's ultimate decision on the selected Construction Option will be primarily based on construction costs and the potential impacts to the use and operations of Runway 15R-33L. The overall duration of the construction and the ability to quickly start and stop construction are critical to the safe and efficient operation of Logan Airport. In addition to cost factors, the ability to quickly construct the safety improvements is critical to airfield operations and also is anticipated to minimize potential environmental impacts.

2.4.2 Runway 22R

The proposed Runway 22R RSA enhancement is to construct a 500 foot wide Inclined Safety Area, extending from the existing perimeter road approximately 130 feet to the low water elevation. This ISA would be similar to the existing Runway 22L ISA, and would be constructed of crushed stone with a perimeter stone gabion retaining wall to prevent erosion of the ISA. The inclined safety area would allow aircraft to transition, in an emergency situation, from the existing RSA to the water while minimizing damage to aircraft and would provide access for emergency responders in the event of an accident. The proposed Runway 22R ISA would be constructed in a single construction season and would cost approximately \$1.4 million.



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3

Affected Environment

3.1 Introduction

The Affected Environment for the Logan Airport Runway Safety (RSA) Improvements Project is documented for each applicable environmental resource category, as specified in FAA *Order 1050.1E*¹ and 301 Code of Massachusetts Regulations (CMR) 11.07(g) to provide a context for understanding the impacts of the proposed Project. The purpose of the Affected Environment analysis is to describe the character of the environment in which the proposed RSA Improvements Project would occur. The Secretary's Certificate on the Draft Environmental Assessment/Environmental Impact Report (EA/EIR) did not require any additional information.

This chapter summarizes environmental resources that the proposed safety improvements would affect. The Project Study Area includes the proposed improvement areas at the ends of both Runways 22R and 33L, and adjacent environmental resources that could be affected by the RSA Improvements Project (Figure 3-1). The affected environment was fully described in Chapter 3 of the Draft EA/EIR, and is summarized in this chapter.

3.2 Resources Categories Not Considered in the Analysis

Several 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 hence would not affect the resource category. Impact categories not present or affected by implementation of any alternatives include:

- Air Quality;
- Compatible Land Use and Noise;
- Socioeconomic Impacts;
- Environmental Justice Populations;
- Department of Transportation Act, Section 4(f) Properties;
- Farmlands;

¹ FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, released March 20, 2006.



Legend

 Study Area



0 625 1,250 2,500 Feet



Logan RSA

Figure 3-1

Logan Airport Project Study Area



- Natural Resources, Energy Supply, and Sustainable Design; and
- Wild and Scenic Rivers.

3.3 Environmental Setting

The following section describes the general environmental characteristics of Logan Airport. Sections 3.4 and 3.5 describe the resources within each portion of the proposed RSA Improvements Project.

3.3.1 Physical Setting

Logan Airport (Figure 3-1) is located primarily on filled land within Boston Harbor, within the heavily urbanized Boston Harbor Watershed. The majority of the seabed adjacent to the Logan Airport property is classified as either low-relief mud or altered by anthropogenic modification. Anthropogenically modified areas are those where the effects of human activity such as dredging, spoil disposal, construction, pipelines and cables are clearly visible. Environmental resources within, and adjacent to, the improvement areas are described in the following sections.

3.3.2 Wetlands

Wetlands are present on Logan Airport property. Wetlands within the Study Area are protected by Section 404 of the Clean Water Act as waters of the United States. Section 404 jurisdiction includes the areas protected by the Massachusetts Wetland Protection Act (MA WPA) (310 CMR 10.00). Section 404 jurisdiction also includes Submerged Aquatic Vegetation, such as eelgrass. The functions and values protected by the wetlands present at Logan Airport include fish and shellfish habitat, production export, sediment/shoreline stabilization, and wildlife habitat.

The wetlands present within the Study Area are also coastal wetlands protected under the MA WPA as:

- Coastal Bank;
- Coastal Beach;
- Salt Marsh;
- Land Containing Shellfish;
- Land Under the Ocean; and
- Land Subject to Coastal Storm Flowage.

There are no inland wetlands within the Study Area that are protected under Section 404 or the MA WPA.

3.3.3 Waterways and Tidelands

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.



3.3.4 Fish, Wildlife and Plants

In conformance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act,² the National Marine Fisheries Service (NMFS) has designated Essential Fish Habitat (EFH) within marine, estuarine and freshwaters of the U.S., including Boston Harbor. Designated EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Within Boston Harbor, EFH has been designated for one or more life stages of 18 species of fish, including Atlantic cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), pollock (*Pollachius virens*), winter flounder (*Pleuronectes americanus*), Atlantic halibut (*Hippoglossus hippoglossus*), bluefish (*Pomatomus saltatrix*), and Atlantic mackerel (*Scomber scombrus*).

The Massachusetts Division of Marine Fisheries (DMF) identified fish and shellfish species that may be found in the vicinity of the proposed RSA Improvements Project and concluded that the mudflats surrounding Logan Airport provide habitat for soft shell clams (*Mya arenaria*) and blue mussels (*Mytilus edulis*), which are commercially and recreationally important species of shellfish. The intertidal mudflats surrounding Logan Airport have been designated by DMF as Shellfish Growing Area GBH5 (area 5.2 adjacent to Runway 22R and area 5.3 adjacent to Runway 33L), which is available for commercial harvest on a conditionally restricted basis.

Review of the Massachusetts Division of Fish and Wildlife, Natural Heritage and Endangered Species Program (NHESP) Atlas³ indicates that a large portion of the airfield at Logan Airport is priority habitat for the upland sandpiper (*Bartramia longicauda*), which is listed as endangered in Massachusetts (Figure 3-2). This species has been known to occur in small numbers in the large grassy uplands in the interior of the airfield.

3.3.5 Federally Listed Threatened and Endangered Species

Federally listed threatened and endangered species are either under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) or NMFS. Generally, USFWS manages land and freshwater species, while NMFS manages marine and anadromous species. USFWS indicated there are no federally listed threatened or endangered species under their jurisdiction within the Study Area.⁴ According to NMFS,⁵ suitable forage and habitat exists in Boston Harbor for three species of federally threatened or endangered sea turtles: loggerhead turtles (*Caretta caretta*), Kemp's ridley turtles (*Lepidochelys kempi*), leatherback sea turtles (*Dermochelys coriacea*); and five species of whales: the federally endangered North Atlantic right (*Eubalaena glacialis*), the federally endangered humpback (*Megaptera novaeangliae*), the fin (*Balaenoptera physalus*), the sei (*Balaenoptera borealis*), and the sperm (*Physeter macrocephalus*) whales.

3.3.6 Water Quality

Boston Harbor has seen dramatic improvements in water quality over the last few years, as a result of long-term community involvement and regulatory controls. The Massachusetts Water Resources Authority (MWRA) Deer Island Treatment Plant and Massachusetts Bay Wastewater Effluent Outfall have also contributed to the improvement of water quality in Boston Harbor.

² Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265, as amended through October 11, 1996. (<http://www.nmfs.noaa.gov/sfa/magact/>)




³ NHESP Atlas, October 2008.

⁴ Letter received from the United States Fish and Wildlife Service, New England Field Office, dated December 19, 2007.

⁵ Letter received from Mary A. Colligan, NMFS Regional Administrator for Protected Resources, dated July 13, 2009.



Legend

-  RSA Improvement Study Area
-  NHESP Priority Habitats of Rare Species
-  NHESP Estimated Habitats of Rare Species



Logan RSA

Figure 3-2

Priority and Estimated Habitat of State-listed Rare Species

Data Sources:
Jacobs Edwards & Kelcey, Inc.
Childs Engineering Corps.
Office of Geographic and Environmental Information (2008)
2008 Aerial Photography (MassGIS)
2008 NHESP Atlas (MassGIS)



The Stormwater Management system at Logan Airport consists of both a closed and open conveyance system. The closed system 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. The open stormwater system uses the airfield's grass swales and open channels to infiltrate stormwater from runway surfaces. The stormwater management system is described in detail in the Draft EA/EIR.

On July 31, 2007, the U.S. Environmental Protection Agency (US EPA) and DEP issued a National Pollutant Discharge Elimination System (NPDES) permit for Logan Airport's stormwater outfalls: NPDES Permit MA0000787. Massport holds a separate NPDES permit for the Fire Training Facility (NPDES Permit MA0032751). The NPDES permit MA0000787 authorizes stormwater discharges from the North, West, Northwest, Porter Street, and Maverick Street outfalls, and all of the airfield outfalls. Water quality monitoring results were provided in the Draft EA/EIR and are available on the Massport website.

3.3.7 Historical, Archaeological, and Cultural Resources

There are no known historical, archaeological, or cultural resources within the Study Area. According to the Massachusetts Historical Commission, there are no historic or cultural resources at the Airport.⁶

3.3.8 Solid and Hazardous Materials

Although there have been reported spills and releases at Logan, these have been addressed through the Massachusetts Contingency Plan (MCP) (310 CMR 40) process, and no releases have occurred within the vicinity of the Study Area.

In accordance with the MCP process, Massport continues to assess, remediate, and bring to regulatory closure areas of subsurface contamination. Massport leads the performance of a variety of response actions, including remediation at sites where Massport is the responsible party, where there are multiple responsible parties, and where no responsible party has been identified. Tracking of MCP activity is reported annually by Massport in the Logan Airport Environmental Data Reports (EEA # 3247) and on the Massport website.

3.3.9 Surface Transportation

This section describes the existing surface transportation system near Logan Airport. FAA *Order 5050.4B* requires an assessment of the surface transportation system as part of the NEPA process when the action could cause disruption of local traffic patterns that substantially reduce the level of service of roads serving an airport and its surrounding communities.⁷ The proposed safety improvements would not change the number of aircraft operations or passenger activity levels, and are anticipated to have only temporary increases in traffic associated with construction workers and vehicles. Short-term construction impacts are expected to be limited to the segments of the East Boston roadways that provide direct access to the Airport's entrances (Service Road, Frankfurt Street, and Prescott Street). As described in Massport's construction management specifications, construction vehicles are restricted from using local roads.

⁶ Letter received from the Massachusetts Historical Commission, dated December 7, 2007.

⁷ Federal Aviation Administration Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects, Federal Aviation Administration United States Department of Transportation, 28 April 2006.



Service Road is a two-lane roadway that provides access from Frankfort Street to the MBTA Airport station. At Airport Station, Service Road becomes a four-lane roadway, wrapping along the north cargo area towards Hotel Drive. Frankfort Street is a two-lane roadway that provides direct access to the North Cargo area and indirect access to Logan Airport via Service Road SR2. Local connections to East Boston and Bennington Street, as well as regional connections via Route 1A are made from Frankfort Street via Neptune Street. Prescott Street is a two-lane roadway that provides access from both Service Road and Frankfort Street to the North Cargo area and the airside roadway infrastructure.

3.3.10 Air Quality

The federal Clean Air Act (CAA), the National Ambient Air Quality Standards (NAAQS) (40 CFR part 50), and similar state law govern air quality issues 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 this area. NAAQS includes a group of criteria air pollutants to protect public health, the environment, and the quality of life from the detrimental effects of air pollution. These NAAQS are set for the following six pollutants: carbon monoxide (CO); lead (Pb); nitrogen dioxide (NO₂); ozone (O₃); particulate matter smaller than or equal to 10 microns in diameter (PM₁₀); particulate matter smaller than or equal to 2.5 microns in diameter (PM_{2.5}); and sulfur oxides (SO_x).

In accordance with the CAA, and based on air quality monitoring, all areas within Massachusetts are designated with respect to the NAAQS as attainment, nonattainment, maintenance, or unclassifiable. 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. An area may also be designated as unclassifiable when there is a temporary lack of data to form a basis for determining attainment status. Nonattainment areas are further classified as extreme, severe, serious, moderate or marginal by the degree of non-compliance with the NAAQS. The entire Boston metropolitan area is designated as attainment for all the criteria pollutants except ozone, which is designated as “moderate” nonattainment for the 1997 8-hour ozone standard. The ozone nonattainment area consists of ten counties in Massachusetts (Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester). Logan Airport is located in Suffolk County. The Boston area is also presently designated as attainment/maintenance for CO, indicating that it is in transition to attainment for this pollutant.

In 2009, Massport conducted an emission inventory for Logan Airport for the pollutants Volatile Organic Compounds (VOCs), CO, NO_x and PM_{2.5} and PM₁₀. 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 2009.⁸

8 Massachusetts Port Authority. *Logan Airport 2009 Environmental Data Report, Appendix I, Air Quality*. EOE #3247, September 2010.



3.3.11 Noise Environment

The noise environment at Logan Airport has been documented in the Draft EA/EIR, several previous studies, and in the *Logan Airport 2009 Environmental Data Report (EDR) Appendix H, Noise Abatement*.⁹

3.4 Runway 33L Existing Environmental Conditions

Runway 15R-33L is Logan's longest runway, and extends from the northwest corner of the Airport in East Boston to the edge of Boston Harbor. The southern end of Runway 33L faces the shipping and navigation channels in Boston Harbor. There are no developed areas adjacent to Runway 33L as its end is at the edge of the Boston Harbor, and the Runway itself is surrounded by Airport property (Figure 3-1). The closest neighborhood to the Runway 33L end is the Point Shirley residential neighborhood in Winthrop across Boston Harbor, approximately 3,000 feet from the runway end.

This section describes the existing environmental conditions specific to the Runway 33L Study Area (Figure 3-1) that the proposed Runway 33L RSA improvements would affect, based on conceptual design.

3.4.1 Wetlands

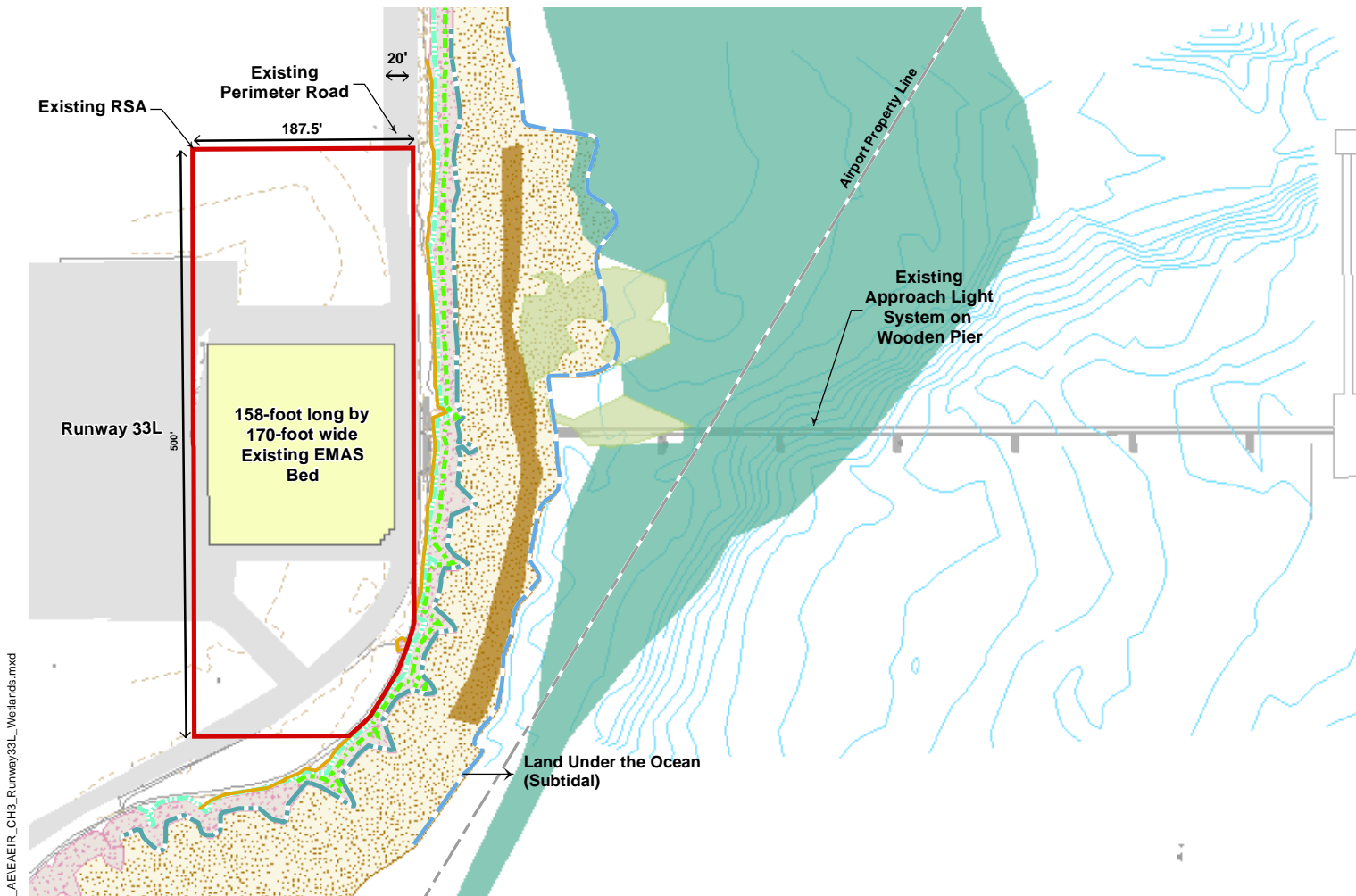
The Runway 33L RSA area includes Coastal Bank, Coastal Beach, Land Containing Shellfish, and Land Under the Ocean (Figure 3-3), as defined by the MA WPA regulations (310 CMR 10.00 et seq.). Portions of this area are also subject to MA WPA regulations as Land Subject to Tidal Action and Land Subject to Coastal Storm Flowage. Coastal Beach and Land Under the Ocean are also waters of the United States under federal jurisdiction.

The Coastal Bank at Runway 33L is placed stone. It does not supply sediment and is significant only to storm damage prevention. An existing timber pier that supports the approach lighting system for Runway 33L arrivals extends from the Coastal Bank approximately 2,400 feet into Boston Harbor. West of the pier, several large boulder groins form the upper substrate portion of this high energy environment. Large boulder placed rip-rap is also east of the pier along the upper Coastal Bank, and concrete has been poured over the boulders and cobble-sized stones to help stabilize the slope. Below the riprap and groins, the Coastal Beach is composed of cobbles over gravel and silty sand, and extends down to the mean low water line. Some of the cobbles remain from the recovery effort in 1984 to salvage the World Airways aircraft that crashed at this location. Land Under the Ocean extends seaward from the mean low water line, and consists of sand and silt in varying combinations with no evidence of gravel. Sediment samples were collected at the end of Runway 33L in August and October 2007. In general, the area of Land Under the Ocean in deeper waters contains more silt than sand, while the area in shallower waters contains more sand than silt.¹⁰

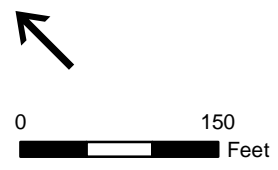
There are no vegetated wetlands (salt marsh) present at the end of Runway 33L. An eelgrass (*Zostera marina*) bed (submerged aquatic vegetation) is located at the end of Runway 33L. Eelgrass beds serve as nursery areas for commercially important fish and shellfish species, provide a feeding area for waterfowl and fish, and are a

⁹ Massachusetts Port Authority. *Logan Airport 2009 Environmental Data Report, Appendix H, Noise Abatement*. EOE #3247, September 2010.

¹⁰ Vanasse Hangen Brustlin, *Sediment Grain-Size Analysis Draft Technical Memorandum*, Boston Logan International Airport, East Boston, Massachusetts, September 19, 2008.



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Legend















- | | | | |
|--|----------------------------|---|--|
|  | Existing RSA |  | Existing Contour |
|  | Existing EMAS Bed |  | Existing Bathymetric Contour |
|  | Coastal Bank |  | Highest High Water (7.3') |
|  | Coastal Beach (Intertidal) |  | Mean High Water (5.13') |
|  | Raised Mussel Bed |  | Mean Low Water (-4.36') |
|  | Cobble Mussel Bed |  | Top of Coastal Bank |
|  | Elgrass |  | Limit of Land Subject to Coastal Storm Flowage |



Figure 3-3
Runway 33L
Coastal Wetlands

Source: Jacobs Edwards & Kelcey, Inc.
Childs Engineering Corps.
VHB Field Work - 2008; 2010



direct source of food or detritus for coastal food webs. They also act to stabilize sediments and filter excess nutrients from the water, thereby protecting water quality. These meadows are important to the coastal marine ecosystem. Loss of eelgrass habitat due to anthropogenic impacts on the Massachusetts coastal marine ecosystem and other causes such as wasting disease has been extensive. Although eelgrass meadows were once prolific in Boston Harbor and elsewhere along the coast, Boston Harbor beds now can be found in only a few isolated locations.¹¹

Field surveys were conducted on October 15, 2007, and April 8, 2008, to map the extent of the eelgrass bed. Nine underwater video transects were conducted during the survey on October 15, 2007, to determine the extent and density of the eelgrass bed. On April 8, 2008, the landward edge of the eelgrass bed was mapped using a global positioning system (GPS). The surveys show that the eelgrass bed covers an area of approximately 54 acres. As shown on Figure 3-4, the eelgrass bed is primarily on the east side of the Runway 33L light pier. In this area, the boundary of the eelgrass bed extends from approximately 70 to 1,700 feet from the shoreline (measured from the top of Coastal Bank), and approximately 2,400 feet east of the light pier. Figure 3-4 shows that the boundary of the eelgrass bed identified during the field surveys encompasses the area previously defined by the DEP (2001 MassGIS data). The eelgrass bed has grown substantially since 2001 and is larger than the bed previously defined by DEP.

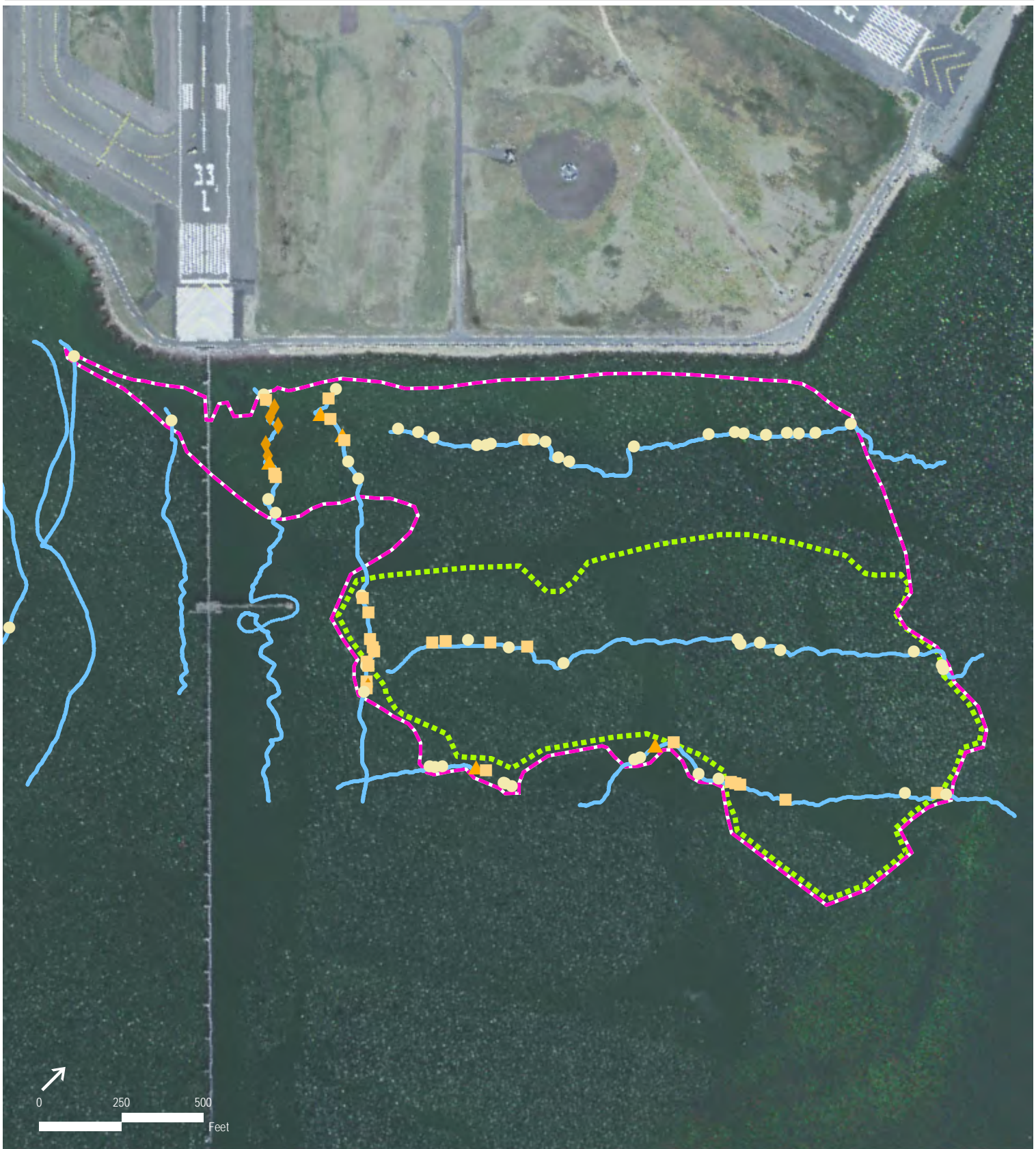
Coastal processes describe the series of actions (currents, waves, sediment erosion and deposition, and marine resources) that move sediment, shape coastal landforms, and determine the geologic evolution of coastlines, including coastal wetlands. A field study was conducted in late summer/early fall of 2007 to characterize the oceanography and surficial geology of the marine waters around the Airport. Conclusions from this study were described in detail in the Draft EA/EIR.

3.4.2 Fish, Wildlife and Plants

This section summarizes fish, wildlife and plant species identified within the Runway 33L Study Area. The predominant plant species identified within the waters adjacent to the Runway 33L end include eelgrass, protected under the MA WPA and discussed in the Wetlands section (Section 3.4.1). Other plant species such as Irish moss (*Chondrus crispus*) and brown kelp (*Laminaria agardhii*) were found in the waters off Runway 33L. Primary benthic aquatic species include soft-shelled clams (*Mya arenaria*), blue mussel (*Mytilus edulis*), barnacles (*Balanus* sp.), in addition to the numerous fish species found in Boston Harbor, as described in Section 3.3.4. Polychaetes (*Nereis virens*, *Pectinaria gouldii*) were also found in the Runway 33L Study Area. The intertidal mudflats surrounding Runway 33L have been designated by DMF as part of Shellfish Growing Area GBH5.3 that are available for commercial harvest on a conditionally restricted basis.

A shellfish field survey was conducted off the end of Runway 33L on April 8, June 5, and June 6, 2008. Blue mussels were found in high densities in several areas. A large and densely populated mussel bed is located on the Coastal Beach/Tidal Flat east of the Runway 33L light pier and additional mussel resources are located above the Coastal Beach/Tidal Flat area interspersed within the rocky beach slope (Figure 3-3). The mussel bed on the Coastal Beach/Tidal Flat consists of a dense but patchy bed of live blue mussels attached to a substrate of

¹¹ <http://www.mass.gov/dfwele/dmf/programsandprojects/hubline/eelgrass.htm>, accessed January 5, 2010.



Legend

- - - Limit of Eelgrass Bed (June 2008)
 - - - MassGIS Eelgrass Bed (2001)
 - Video Transects
- | Percent Eelgrass Cover (Visual Estimate) | |
|--|------------|
| ● | 1% - 20% |
| ■ | 21% - 40% |
| ▲ | 41% - 60% |
| ◆ | 61% - 100% |



Logan RSA

Figure 3-4
Runway 33L
Eelgrass Survey

Data Sources:
 CR Environmental, Inc.
 USGS Digital Raster Graphic (DRG) Boston North - Office of
 Geographic and Environmental Information (MassGIS)



dead shell and trapped mud that is raised above the flat. Mussels occur at a density of 420 per square meter in this area (963 square meters or 10,361 square feet). Mussels occur at a density of 200 per square meter in the rocky intertidal zone west of the Runway 33L light pier (approximately 483 square meters or 5,200 square feet).

During the field survey, a small number of live soft shell clams were observed in the Coastal Beach/Tidal Flat areas off the end of Runway 33L. Of the five live soft shell clams collected, no market size individuals were observed. Based on numbers recovered, densities of soft shell clams are estimated at 9.3 per square meter.¹² There are no commercially harvestable soft shell clams at the Runway 33L end.

3.4.3 Water Quality

The stormwater management system in the vicinity of Runway 33L consists of both a closed and open stormdrain system. The closed system includes catch basins and pipes to convey stormwater from the perimeter roadway and taxiways to two nearby outfalls discharging Boston Harbor: Airfield Outfall A-29, northeast of the Runway end which drains approximately 35.5 acres; and Outfall A-30 which drains approximately 11.6 acres, southwest of the Runway 33L end. The open stormwater system uses the airfield’s grass swales and open channels to infiltrate stormwater from the runway surface. The stormwater management system was described in detail in the Draft EA/EIR.

Offshore water samples were collected in conjunction with the compilation of vibracore samples off Runway 33L. Vibracore sampling is a method of retrieving undisturbed samples in marine environments to evaluate sub-bottom sediments. The following parameters were recorded: temperature, pH, turbidity, water depth (Secchi-disk reading), and depth to the bottom. Two water samples were collected off of the end of each runway, in the approximate location where the cores were collected. Temperature and pH were measured in the field with an Extech ExStik II EC-500 probe. Turbidity was recorded using a LaMotte Model BH-3 turbidimeter on samples collected in the field. The Secchi disk was lowered into the waterbody and the depth of the water where the disk vanishes and reappears was recorded as the Secchi disk reading (nearest foot). The depth to bottom measurement was recorded from the boat’s sonar. Table 3.4-1 presents the results of the analysis of water samples that were collected at Runway 33L.

Table 3.4-1 Results of Water Quality Sampling Analysis, Runway 33L

Station	Time	Water Temp. (°C)	pH	Turbidity (NTU)	Secchi disk depth (ft)	Depth to bottom (ft)
Runway 33L NE	8:30 AM	1.6	8.0	0.95	10.3	14.3
Runway 33L SW	8:45 AM	1.7	8.1	0.68	9.5	25.0

NTU: Nephelometric Turbidity Units.

Source: Vanasse Hangen Brustlin, Water Quality Sampling Draft Technical Memorandum, Boston Logan International Airport, East Boston, Massachusetts, September 25, 2008.

The turbidity levels ranged from 0.68 to 0.95 NTU at the end of Runway 33L. The pH levels were steady at 8.0 to 8.1 for all samples, consistent with normal pH values in sea water that are about 8.1 at the surface and decrease

¹² Vanasse Hangen Brustlin, Wetland Delineation and Shellfish Survey Results Draft Technical Memorandum, Boston Logan International Airport, East Boston, Massachusetts, September 19, 2008.



to about 7.7 in deep water. The Secchi-disk depth ranged from 9.5 to 10.3 feet for the samples collected. It should be noted that the difficulty of maintaining a constant position in a boat made the Secchi-disk readings more variable than could be obtained from a fixed platform sampling station. Results show that turbidity levels are low, causing limited or no interference with sunlight penetration for photosynthesis.

3.4.4 Light Emissions and Visual Setting

According to FAA Order 1050.1E, FAA must consider the extent to which any lighting associated with any action will create an annoyance among people in the vicinity or interfere with their normal activities.¹³ Runway 33L is equipped with navigational aids (navaids). Navaids include visual or electronic devices, either airborne or on the ground, that provide guidance information or position data to aircraft using the runway. At the Runway 33L end a Medium Intensity Approach Lighting System with runway alignment indicator lights (MALSR) is used. A MALSR is an approach light system that extends 2,400 feet away from the runway threshold, which is a required component of an ILS approach. The MALSR lights, spaced at 200-foot intervals, are located on a pile-supported timber pier that extends 2,400 feet into Boston Harbor. The closest neighborhood to Runway 33L is the Point Shirley residential neighborhood in Winthrop across the Harbor, which is approximately 3,000 feet northeast of the Runway 33L end.

The Runway 33L end is slightly elevated above sea level on filled tidelands. In clear sunny weather conditions, it is possible to see the runway end from the Point Shirley neighborhood across the Harbor. However, the runway end is approximately 1 mile from this neighborhood, a substantial visual distance from the shoreline. The view looking towards the Runway 33L end from the Point Shirley neighborhood is primarily of the open water and the distant end of the light pier, with a low-profile shoreline.

3.5 Runway 22R Existing Environmental Conditions

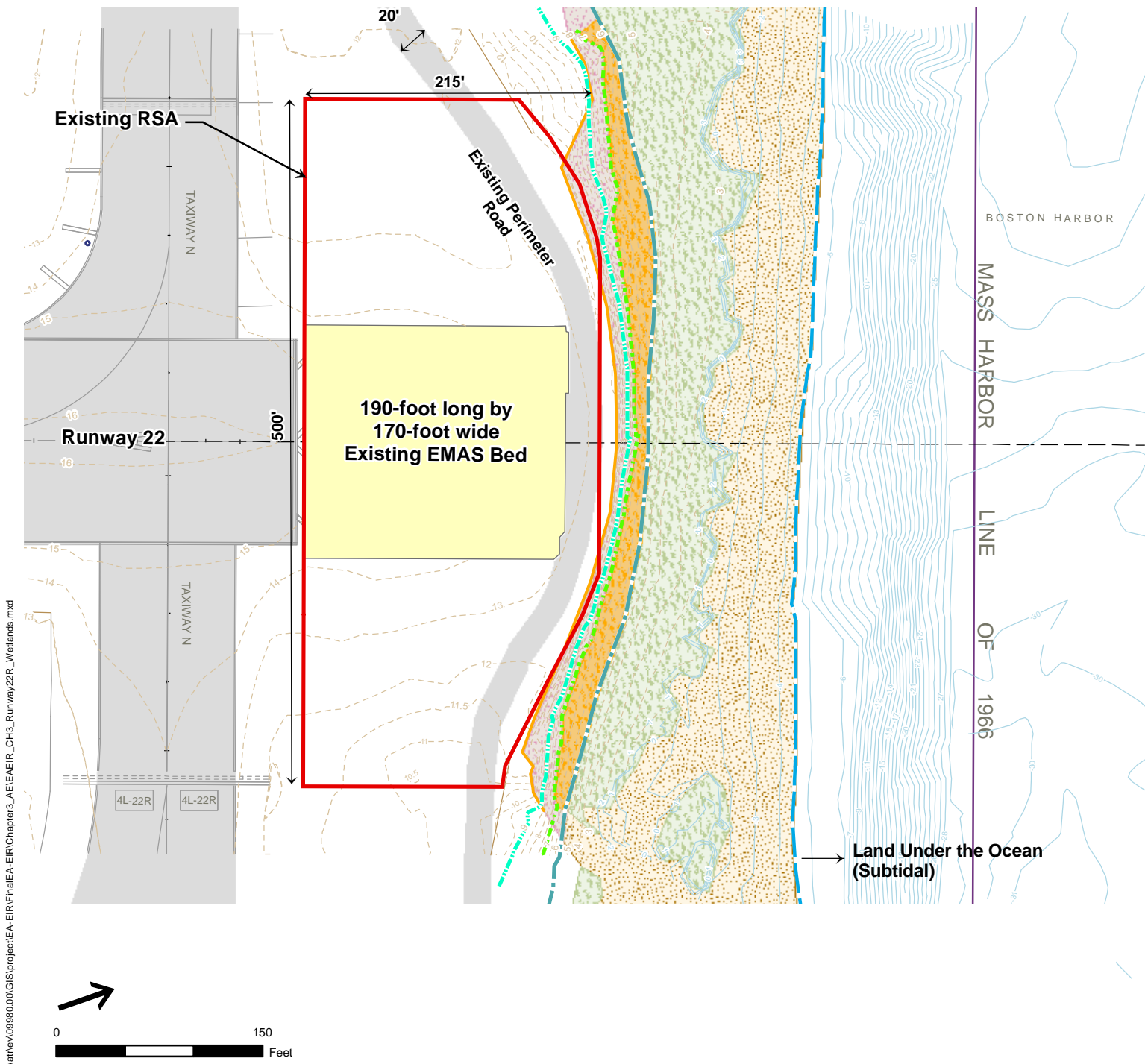
The end of Runway 22R faces East Boston. There are no on-airport developed areas adjacent to Runway 22R as its end is at the northern edge of the Logan Airport property and the Runway 22R is surrounded by Logan Airport property (Figure 3-1). The closest neighborhood to Runway 22R is the Orient Heights neighborhood and Bayswater Street in East Boston directly across the Harbor. Bayswater Street is approximately 1,500 feet north of the Runway 22R end.

3.5.1 Wetlands

The Runway 22R RSA Study Area includes Coastal Bank, Coastal Beach, Salt Marsh, Land Containing Shellfish, and Land Under the Ocean (Figure 3-5), as defined by the MA WPA regulations (310 CMR 10.00 et seq.). Portions of this area are also subject to MA WPA regulations as Land Subject to Tidal Action and Land Subject to Coastal Storm Flowage. Coastal Beach, Salt Marsh, and Land Under the Ocean are also protected under the federal Section 404 jurisdiction.

Salt marsh was delineated off the end of Runway 22R in June 2008. Wetlands were identified based on the presence of salt marsh grasses (*Spartina alterniflora* and *S. patens*) and common glasswort (*Salicornia europaea*).

¹³ Federal Aviation Administration. Order 1050.1E, Environmental Impacts: Policies and Procedures, 20 March 2006.



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Legend

- Existing RSA
- Existing EMAS Bed
- Coastal Bank
- Coastal Beach (Intertidal)
- Salt Marsh
- Phragmites-dominated Salt Marsh
- Existing Contour
- Existing Bathymetric Contour
- Highest High Water (7.3')
- Mean High Water (5.13')
- Mean Low Water (-4.36')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage



Logan RSA

Figure 3-5
Runway 22R
Coastal Wetlands

Source: Jacobs Edwards & Kelcey, Inc.
Childs Engineering Corps.
Office of Geographic and Environmental Information
(2004, 2006 MassGIS)



Salt marsh is located on a peat terrace at the end of Runway 22R that varies in width from 30 feet in the east to 120 feet wide to the west. To the east is a small 30-foot long break in the salt marsh fringe along the shoreline and an isolated “island” of salt marsh (Figure 3-5). The seaward boundary of the salt marsh is an abrupt vertical face of the peat mat and is eroding, most likely due to wakes from pleasure boat traffic in the adjacent waterway.¹⁴

The Coastal Bank at the Runway 22R end is dominated by the invasive common reed (*Phragmites australis*). This area of Coastal Bank is stable and not eroding, and it contributes to storm damage prevention. The Coastal Beach/Tidal Flat consists of silty sand and extends seaward to the mean low water line. Small patches of green algae (*Enteromorpha* sp.) were observed submerged just beyond the low mean water line. Animals observed on the tidal flat and just below mean low water include common periwinkles (*Littorina littor*), eastern mud snails (*Ilyanassa obsoleta*), hermit crabs (*Pagurus longicarpus*), sand shrimp (*Crangon septemspinosa*), and common painted worm (*Nephtys incisa*). Northern rock barnacles (*Balanus balanoides*) and green crab (*Carcinus maenas*) were noted in the intertidal zone. Herring gulls (*Larus argentatus*) were observed foraging along the tidal flats. Species of shellfish including soft shell clams and razor clams (*Ensis directus*) have also been observed on the Tidal Flat surface.

There are no eelgrass beds at the end of Runway 22R. Eelgrass beds were not observed on the Tidal Flat during field surveys conducted in June 2008 during extreme low water events and eelgrass detritus was not observed washed up on the shoreline at the end of the runway. In addition, no eelgrass was picked up when sediment grab samples were collected at the end of Runway 22R. Furthermore, mapping conducted in Boston Harbor by the DEP has not identified the presence of eelgrass beds at the end of Runway 22R.

3.5.2 Fish, Wildlife and Plants

This Section discusses fish, wildlife and plant species identified within the Runway 22R Study Area. The predominant plant species identified within the waters adjacent to the Runway 22R end include salt marsh grasses, protected under federal Clean Water Act Section 404 and the MA WPA, and discussed in Section 3.5.1. Primary aquatic species include soft-shelled clams, razor clam, sand shrimp, mud snails, and green crab, in addition to the numerous fish species found in Boston Harbor, as described in Section 3.3.4. Polychaetes (*Nereis virens*, *Pectinaria gouldii*) were also found in the Runway 22R Study Area.

The intertidal mudflats surrounding Runway 22R have been designated by DMF as part of Shellfish Growing Area GBH5.2 and are available for commercial harvest on a conditionally restricted basis. In its comment letter on the Draft EA/EIR, the DMF indicated that the Shellfish Growing Area GBH5.2, which extends from northern edge of Runway 22R to the end of Runway 27, has a shellfish recruitment that may span several years, and an average annual production of over 5,130 bushels of soft shell clams per year.¹⁵ The area off of Runway 22R is favored by the shellfishers because of the wide intertidal flat, which enables access on smaller tides.

¹⁴ Vanasse Hangen Brustlin, Inc, Wetland Delineation and Shellfish Survey Results Draft Technical Memorandum, Boston Logan International Airport, East Boston, Massachusetts, September 19, 2008.

¹⁵ Comment letter on the Draft Environmental Assessment/Environmental Impact Report from the Massachusetts Division of Marine Fisheries, dated September 3, 2010.



A shellfish field survey was conducted off the end of Runway 22R in June 2008 that focused on the beach/tidal flat area seaward of the salt marsh face. All of the live soft shell clams were collected in the eastern portion of the Runway 22R Study Area, at a similar elevation to that of the salt marsh. Soft shell clams were recovered at Runway 22R. Of the seven soft shell clams collected, only two market size individuals (minimum size 2 inches) were observed. Based on data collected, densities of soft shell clams in the eastern portion of the Runway 22R Study Area are estimated at a maximum of 28 per square meter. Most of the surveyed Study Area lacked any soft shell clams, but may support very low population densities. Only one razor clam was collected, therefore the density of razor clams in the Study Area is estimated at a maximum of 1 per square meter.

Substantial numbers of dead soft shell clam shells were also observed throughout the Runway 22R Study Area. In some areas, paired dead soft shell clam shells were typically observed sitting in the sediment in their living position and no live soft shell clams were found in the same location. Given the low density of living soft shell clams and the large number of dead shells observed in the Runway 22R Study Area, it appears that an event in the past may have caused widespread mortality of the population in this area. The ecosystem otherwise appears to be healthy with scyphozoans, polychaetes, gastropods, crustaceans, and fish present in the Study Area and waters offshore.

No mussel beds were observed in the Runway 22R Study Area; however, a low density population of ribbed mussels (*Geukensia demissa*) was observed within the salt marsh. Population densities of the ribbed mussels were not assessed since the mussels occur in low numbers and are not a species that is recreationally or commercially important.

3.5.3 Water Quality

The stormwater management system in the vicinity of Runway 22R consists of both a closed and open conveyance system. The closed system includes catch basins and pipes to convey stormwater from the perimeter roadway and taxiways to two nearby outfalls discharging Boston Harbor: Airfield Outfall A-11, west of the Runway 22R end which drains approximately 3 acres, and Outfall A-12 which drains approximately 3.9 acres, southeast of the Runway 22R end. The adjacent open stormwater system uses the airfield's grass swales and open channels to infiltrate stormwater from the runway surface, primarily from Drainage Area A-10 and A-13. The stormwater management system was described in detail in the Draft EA/EIR.

In 2008, water samples offshore were collected in conjunction with the vibracore samples off Runway 22R. Table 3.5-1 presents the results of the analysis of water samples that were collected at the end of Runway 22R.

Table 3.5-1 Results of Water Quality Sampling Analysis, Runway 22R

Station	Time	Water Temp. (°C)	pH	Turbidity (NTU)	Secchi disk depth (ft)	Depth to bottom (ft)
Runway 22R W	9:30 AM	0.5	8.0	2.73	9.4	13.0
Runway 22R E	9:40 AM	1.0	8.1	3.35	11.0	12.0

ntu: Nephelometric Turbidity Units.

Source: Vanasse Hangen Brustlin, Water Quality Sampling Draft Technical Memorandum, Boston Logan International Airport, East Boston, Massachusetts, September 25, 2008.



The turbidity levels ranged from 2.73 to 3.35 NTU at the end of Runway 22R. The pH levels were steady at 8.0 to 8.1 for all samples, consistent with normal pH values in sea water that are about 8.1 at the surface and decrease to about 7.7 in deep water. The Secchi disk depth ranged from 9.4 to 11.0 feet for the samples collected. Results show that turbidity levels are higher at the Runway 22R end than at the Runway 33L end, possibly causing some interference with sunlight penetration for photosynthesis and deposits of some suspended matter in fish gills and shellfish.

3.5.4 Light Emissions and Visual Setting

Runway 22R is equipped with nav aids that include visual or electronic devices, either airborne or on the ground, which provide guidance information or position data to aircraft using the runway. At the Runway 22R end this includes High Intensity Runway Edge Lights (HILRs). HILRs include two rows of lights, one row on each side approximately 10 feet from the edge of the full-strength runway paving are equally spaced along the runway.

The HILR light source does not represent a potential for annoyance unless they are unduly bright and aimed in the direction of the viewer (a glare condition), or they are flashing intermittently (causing a distraction). The lighting system described above is unobtrusive to the surrounding areas because they are located on the surface of the runway and would not be visible from even the closest neighborhood to the Runway, the Orient Heights residential neighborhood in East Boston approximately 1,500 feet across the Harbor.

The Runway 22R end is slightly elevated above sea level and is located on filled tidelands. It is visible from the Orient Heights neighborhood across the Harbor. The view looking towards the Runway 22R end from this neighborhood is of the distant low-profile shoreline, salt marsh, and coastal bank.



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4

Environmental Consequences

4.1 Introduction

This chapter documents the Environmental Consequences of the proposed Logan Airport Runway Safety Area (RSA) Improvements Project for each applicable environmental resource category, as specified in the Federal Aviation Administration (FAA) *Order 1050.1E*,¹ and as required by the Secretary's Certificate on the Draft Environmental Assessment/Environmental Impact Report (EA/EIR). The information and analysis provided in this chapter also responds to the comments received on the Draft EA/EIR and the Secretary's Certificate. Direct, indirect, and construction impacts are included in the discussion of each impact category for Runway 33L (Section 4.2) and Runway 22R (Section 4.3). These resource categories are addressed in this chapter: Wetlands; Waterways and Tidelands; Fish, Wildlife, and Plants; Federally Listed Threatened and Endangered Species; and Water Quality. The Draft EA/EIR provides a full description of the environmental consequences when compared to the No-Build/No-Action Alternative. Information on resources documented in the Draft EA/EIR, which concluded there would be no impact, is not repeated in this Chapter 4 of the Final EA/EIR.² These categories include Historical, Archaeological, and Cultural Resources; Solid and Hazardous Waste; Light Emissions and Visual Setting; and Construction (Noise, Air Quality, and Surface Transportation). Key findings for all remaining resource categories are summarized in Section 4.1.1. The cumulative impacts of the two RSA improvements, in combination with impacts from other past and future reasonably foreseeable projects, are summarized in Section 4.4.

This Final EA/EIR provides an analysis of whether an impact is significant, in accordance with FAA guidance on impact thresholds for significant adverse effects provided in FAA *Order 1050.1E*. The impact thresholds identified in FAA *Order 1050.1E* are discussed in Section 4.1.3. For each resource category analyzed in this Final EA/EIR, a finding of significance is provided and summarized at the end of this chapter.

Mitigation measures for each affected resource category are identified in Chapter 5, *Proposed Mitigation and Section 61 Findings*, of this Final EA/EIR. Regulatory compliance of the proposed project is discussed in Chapter 6, *Regulatory Compliance*, of this Final EA/EIR.

¹ FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, released March 20, 2006.

² The Draft EA/EIR is provided on the enclosed CD for reference.



4.1.1 Key Findings

The following sections describe the key findings with respect to environmental impacts for the RSA improvements at each runway end, based upon the full analysis provided in the Draft EA/EIR and in subsequent sections of this Final EA/EIR.

4.1.1.1 Runway 33L

Key findings for the proposed Runway 33L safety improvements include:

- The proposed Runway 33L RSA improvements have been designed to avoid and minimize adverse impacts to the maximum extent practicable, but still would have unavoidable permanent impacts to coastal wetlands. The proposed pile-supported deck (approximately 470 feet long by 303 feet wide) would directly and indirectly affect coastal wetlands resources over an area of approximately 3.27 acres. This area consists of aquatic resources subject to federal jurisdiction as Waters of the United States as well as the state-regulated coastal wetland resource areas defined as 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, vertical bulkhead and emergency access ramps and would be approximately 5,615 square feet of resources subject to federal jurisdiction.
- The proposed Runway 33L deck would shade a portion of the eelgrass bed located in the subtidal area adjacent to the Runway 33L end, and would likely result in the direct loss or impairment of approximately 60,100 square feet and in addition, the indirect loss or impairment of approximately 6,500 square feet of the eelgrass bed. This combined area of approximately 66,600 square feet is approximately 3 percent of the total eelgrass bed at the Runway 33L end.³ The use of spud barges in the construction area will avoid impacts associated with anchor-sweep.
- The proposed Runway 33L RSA improvements would not cause any change in wave direction or velocity or result in increased erosion or deposition in the marine environment. As with the existing pier, there would be minor scour effects in the immediate vicinity of each piling.
- Fish and shellfish subtidal habitat ranging from 395 square feet to 1,045 square feet would be displaced, altered, or eliminated by the pilings. However, the pilings would offer new substrates for shellfish, benthic invertebrates, and algae.
- The proposed Runway 33L RSA improvements would not result in any adverse effect that would jeopardize the existence of federally listed threatened and endangered species or adversely change any designated critical habitat.
- The proposed Runway 33L RSA improvements would have no adverse effect on Boston Harbor water quality. The proposed project does not include any new stormwater conveyances or new discharges of untreated stormwater, and has been designed to avoid scour caused by runoff. RSAs are not land uses with

³ The analysis completed for the Draft EA/EIR was based on a 303-foot width; therefore, the impact analysis has not changed in the Final EA/EIR.



a higher pollutant load and are not anticipated to increase total suspended solids (TSS) in the waters adjacent to the Runway 33L end.

- The existing navigational light system at the Runway 33L end would be upgraded. New lights would be added to the existing system near the end of the proposed deck. There would be no additional light impacts that would be expected to cause an annoyance to residential neighbors in Winthrop, approximately 3,000 feet northeast of the Runway 33L end.
- The proposed Runway 33L RSA improvements would alter the shoreline view due to the replacement of part of the existing timber light pier by a wider pile-supported pier structure. However, at the distance the shoreline is viewed from the closest residential neighborhood (approximately 3,000 feet east), the view of the RSA would not be substantially different than the existing view.
- Construction would not result in significant impacts, but construction noise could affect fish in the immediate vicinity of the work area. Temporary discharge of sediment could affect water quality in a localized area adjacent to the proposed Runway 33L RSA improvements. Most of the construction materials, equipment, and personnel would be transported by barge and would not contribute to surface traffic in the vicinity of Logan Airport. Noise generated by construction would not have an adverse effect on residential areas, and noise levels would not exceed City of Boston criteria. Emissions of air pollutants during construction would meet the “*de minimis*” standards for general conformity with the National Ambient Air Quality Standards (NAAQS).

4.1.1.2 Runway 22R

Key findings for the proposed Runway 22R Inclined Safety Area (ISA) include:

- The proposed Runway 22R ISA would have permanent impacts to coastal wetlands. The ISA, constructed with gravel fill, would replace coastal wetland resources in an area of approximately 1.43 acres, including approximately 35,040 square feet of salt marsh. This area is subject to federal jurisdiction as Waters of the United States, as well as the state-regulated resource areas Coastal Beach/Tidal Flats, Salt Marsh, Land Containing Shellfish, and Land Under the Ocean. State-regulated Coastal Bank would also be altered.
- The proposed Runway 22R ISA would not cause any change in wave direction or velocity or result in increased erosion or deposition in the marine environment. These findings are consistent with ongoing observations of the ISA constructed at Runway 22L in the early 1990s.
- Fish and shellfish habitat in the intertidal zone would be displaced, altered, or eliminated with the placement of gravel fill to the mean lower low water line. Within this area, some dredging or excavation would be needed to remove unsuitable substrate materials.
- The proposed Runway 22R ISA would not result in any adverse effect that would jeopardize the existence of federally listed threatened and endangered species or adversely change any designated critical habitat.



- The proposed Runway 22R ISA would have no adverse effect on Boston Harbor water quality. The proposed project does not include any new stormwater conveyances or new discharges of untreated stormwater, and has been designed to avoid scour caused by runoff. RSAs are not land uses with a higher pollutant load and are not anticipated to increase TSS in the waters adjacent to the Runway 22R end. As noted above, these findings are consistent with observations of the existing Runway 22L ISA.
- There are no new light sources proposed as part of the proposed Runway 22R ISA.
- The proposed Runway 22R ISA would alter the shoreline view due to the removal of vegetation and placement of gravel fill. However, at the distance the shoreline is viewed from the closest residential neighborhood, approximately 1,500 feet north, the view of the ISA would blend with the adjacent natural shoreline. The visual impact of the proposed Runway 22R ISA would be consistent with existing conditions at Runway 22L.
- Construction would not result in significant impacts. Trucks carrying construction materials, equipment, and personnel would have a minimal impact on surface traffic in the vicinity of Logan Airport. Noise generated by construction would not have an adverse effect on residential areas, and noise levels would not exceed City of Boston criteria. Emissions of air pollutants during construction would meet the “*de minimis*” standards for general conformity with the NAAQS.

4.1.2 Methodology

The following section describes how the environmental consequences were determined for each resource category for proposed safety improvements to both the Runway 33L RSA and Runway 22R ISA.

4.1.2.1 Direct Impacts

Direct impacts are caused by the proposed action and occur at the same place and at the same time. Direct impacts were determined for each runway end per resource category based on the footprint of the area altered. The list of resource categories evaluated in this Final EA/EIR was developed based on the FAA’s NEPA regulations (FAA *Order 1050.1E*) and the Secretary’s Certificate on the Draft EA/EIR. These include:

- Wetlands;
- Chapter 91 Waterways and Tidelands;
- Fish, Wildlife, and Plants;
- Federally Listed Threatened and Endangered Species; and
- Water Quality.

4.1.2.2 Indirect Impacts

Indirect impacts are defined as being caused by a proposed action and occur later in time or in another location, but are still reasonably foreseeable. Indirect impacts could occur elsewhere in Boston Harbor, in the nearby neighborhoods, or at Logan Airport as a result of the Proposed Action. Indirect impacts were determined for each runway end per resource category identified in Section 4.1.3.1.



4.1.2.3 Temporary Construction-Related Impacts

Temporary, construction-related impacts occur on a short-term basis during construction only based on construction methods, duration, materials, and equipment. Temporary, construction-related impacts were determined for each runway end per resource category identified in Section 4.1.2.1, and for other resource categories where there are no permanent direct or indirect impacts (Surface Transportation, Noise, and Air Quality). Construction-related Surface Transportation, Noise, and Air Quality impacts are documented in the Draft EA/EIR.

4.1.2.4 Cumulative Impacts

Cumulative impacts are described as the incremental impact of a proposed project when added to the impacts from past, present, and reasonably foreseeable future projects undertaken by any agency or person. The timeframe for consideration of cumulative impacts takes into account past impacts and future impacts through 2018, which is five years from the projected completion of the proposed RSA improvements. The discussion focuses on the cumulative impacts to eelgrass, shellfish, salt marsh, water quality, essential fish habitat, and benthic organisms. Impacts of the proposed RSA Improvements Project may be insignificant by themselves, but as impacts accumulate over time, from one or more sources, the impact may become significant.

4.1.3 Significance Thresholds

In the Draft EA/EIR, for each environmental impact category, the Build Alternatives for Runway 33L and Runway 22R were compared to the No-Action/No-Build Alternative to determine the effect (beneficial or adverse) of the alternative on each environmental resource category. Where a reasonable alternative would result in an environmental impact, the Draft EA/EIR provided an analysis of whether that impact is significant, based on FAA guidance on impact thresholds for significant adverse effects provided in FAA *Order 1050.1E, Appendix A*⁴ and summarized in Table 4.1-1. The findings of the Draft EA/EIR were either carried forward to this Final EA/EIR or revised based on new analysis. Measures proposed to avoid, reduce, and/or mitigate the potential impacts summarized in this Chapter are presented in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

⁴ Federal Aviation Administration Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, Federal Aviation Administration, United States Department of Transportation, 28 April 2006, Table 7-1. Significance Thresholds.



Table 4.1-1 FAA Order 1050.1E Impact Thresholds for Significant Adverse Effects

Impact Category	Order 1050.1E Impact Threshold for Significant Adverse Effects
Noise	When an action, compared to the no action alternative for the same timeframe, would cause noise sensitive areas located at or above DNL 65 dB to experience a noise increase of at least DNL 1.5 dB.
Surface Transportation	None established. See significance threshold for social and socioeconomic issues.
Air Quality	When a project or action exceeds one or more of the National Ambient Air Quality Standards (NAAQS).
Historical, Architectural, Archaeological, and Cultural	When an action adversely affects a protected property and the responsible FAA official determines that the information from the State and/or Tribal Historic Preservation Officer addressing alternatives to avoid adverse effects and mitigation warrants further study.
Wetlands and Waterways	When an action would: <ul style="list-style-type: none"> • Adversely affect a wetland's function to protect the quality or quantity of a municipal water supply, including sole source aquifers and a potable water aquifer. • Substantially alter the hydrology needed to sustain the affected wetland's values and functions or those of a wetland to which it is connected. • Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare. The last term includes cultural, recreational, and scientific public resources or property. • Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically-important timber, food, or fiber resources of the affected or surrounding wetlands. • Promote development that causes any of the above impacts. • Be inconsistent with applicable State wetland strategies.
Water Quality	When an action would not meet water quality standards. Potential difficulty in obtaining a permit or authorization may indicate a significant impact.
Fish, Wildlife, and Plants	For Federally listed species: When the U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines a proposed action would likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat. For non-listed species: Consider scientific literature on and information from agencies having expertise addressing on the affected species. Consider information on: project effects on population dynamics; sustainability; reproduction rates; natural and artificial mortality (aircraft strikes); and the minimum population size needed to maintain the affected population.
Floodplains	When notable adverse impacts on natural and beneficial floodplain values would occur.
Coastal Resources	None established.
Hazardous Materials and Solid Waste	When an action involves a property on or eligible for the National Priority List (NPL). Uncontaminated properties within a NPL site's boundary do not always trigger this significant impact threshold. For solid waste: None established.
Light Emissions and Visual Impact	For light emissions: When an action's light emissions create annoyance to interfere with normal activities. For visual effects: When consultation with Federal, State, or local agencies, tribes, or the public shows these effects contrast with existing environments
Construction Impacts	See significance threshold for the resource(s) construction would affect.

Note: Excludes categories not present in the Study Area.



4.2 Runway 33L

A pile-supported deck is proposed for the Runway 33L end as described in Chapter 2, *Alternatives*, and shown on Figure 2-4 and Figure 2-5. The five retained construction options⁵ evaluated in this Chapter have similar impacts and are retained in order to maintain flexibility in design. These options would have the same deck dimensions and therefore the same impacts to eelgrass, and have only minimal differences in the direct impacts of the pilings, which would range from 460 square feet to 1,175 square feet. The preferred alternative will be identified once the design/build contractor has been selected, and is likely to be a modification of one of these five construction options. Consistent with the requirement of the Secretary's Certificate on the Draft EA/EIR, Massport will continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree possible.

The following sections describe the direct and indirect environmental consequences specific to the Runway 33L RSA associated with the proposed pile-supported deck, based on the conceptual design. Construction-related impacts are described in detail for each resource category.

The construction methods, phasing and sequencing for each construction option are also described in Section 2.2.4 of Chapter 2, *Alternatives*. Construction of any of the options is expected to occur over up to three construction seasons, starting in 2011. The Massachusetts Division of Marine Fisheries (DMF) has recommended a time of year restriction extending from February 15th to June 30th for any in-water silt producing work.⁶ Logan Airport relies on Runway 15R-33L primarily between November and March to accommodate wind direction during that time of year. In addition, construction associated with any runway may have to stop and start due to weather and runway use requirements. It is anticipated the target period for pile-driving is between July 1st and November 30th during 2011, 2012, and 2013. However, actual pile-driving operations could be extended beyond November should the wind and weather permit, but would likely be completed in 1- 2 seasons. Construction would be primarily undertaken from the water, as most of the materials would be delivered to the Project area via barge. The only materials expected to be delivered by truck are the EMAS blocks and concrete, as well as paving materials for the Taxiway C1 Connector and the perimeter road.

The following sections provide descriptions of the environmental consequences of the proposed Runway 33L RSA improvements. The impacts to wetlands are described in Section 4.2.1. Section 4.2.2 is a description of the impacts to Chapter 91 waterways and tidelands. The impacts to fish, wildlife, and plants and to federally listed threatened and endangered species are described in Section 4.2.3 and Section 4.2.4, respectively. Water quality impacts are described in Section 4.2.5.

5 Option 1: 20-inch diameter piles with 12-foot bent spacing; Option 2 – 20-inch diameter piles with 70-foot bent spacing; Option 3 – 20-inch diameter piles with 100-foot bent spacing; Option 5 – 48-inch diameter caissons with 70-foot bent spacing; and Option 6 – 48-inch diameter caissons with 100-foot bent spacing.

6 Comment Letter on the ENF received from the Massachusetts Division of Marine Fisheries, dated August 7, 2009.



4.2.1 Wetlands

There are coastal wetlands present within the limits of the proposed Runway 33L RSA improvements as described in Chapter 3, *Affected Environment*. The following section describes the environmental consequences of the Build Alternative for each construction option. NEPA regulations that address wetlands are discussed in FAA Order 5050.4B and in FAA Order 1050.1E, Appendix A, Section 18.3. The FAA orders identify the significant impact thresholds for wetlands and describe the requirements of the wetlands analysis to determine whether impacts on wetlands are significant. The Secretary's Certificate required that the Final EA/EIR include:

- Clarification of the impacts to various wetland resource areas and types, including distinction between state and federal resources;
- Design level plans depicting resource area impacts and mitigation in greater detail than what was provided in the Draft EA/EIR, as well as include detailed construction and operational specifications;
- Investigation and reporting on the conditions of shellfish and benthic habitats underlying large piers in Boston Harbor and provide information on what monitoring will occur for invasive species and colonization of mussels following construction;
- A detailed account of expected impacts to shellfishing;
- Outreach to the affected shellfishing community; and
- Sediment sampling and testing information as well as discussion of dredge material disposal.

4.2.1.1 Direct Impacts

The proposed pile-supported deck would result in the alteration or loss of coastal wetland resources. The following sections provide a comparison of the wetland impacts resulting from the five construction options for a pile-supported deck to be constructed at Runway 33L. Coastal wetland resources were identified and delineated as described in Section 3.4.1 of Chapter 3, *Affected Environment*. The wetland delineation was overlaid with the footprint of the proposed Runway 33L construction options to quantify the potential direct impacts to coastal wetlands.

Direct impacts would result from installing piles or caissons to support the deck, installing 16-inch diameter piles to support the localizer deck, installing timber piles to support the light pier extensions, and constructing two emergency access ramps. Direct impacts would also result from sediment deposition occurring during construction. Eelgrass growing under the footprint of the RSA deck could be lost due to shading, as the future light levels may be inadequate to support eelgrass. The direct impacts that result from installing piles to support the localizer deck, installing timber piles to support the light pier extensions, constructing the emergency access ramp, and shading impacts would be the same across each construction option. The direct impacts resulting from installing piles or caissons to support the deck and from sediment deposition vary depending on the option and are described in the sections below.



State-Regulated Wetland Resources

The following section identifies the state-regulated wetland resources within the Runway 33L project area and the anticipated impacts that would result from construction of the proposed Runway 33L RSA (see Figures 4-1 through 4-6). Table 4.2-1 summarizes the impacts to state-regulated wetland resources.

Buffer Zone

There is a state-regulated buffer zone extending 100 feet landward from the top of Coastal Bank. Work proposed within the buffer zone includes removing a segment of the existing perimeter road (which will be relocated outside of the buffer zone). Work within the buffer zone also includes reconstructing the existing EMAS bed and RSA and utility (electricity) extension to the proposed relocated localizer.

Coastal Bank

Each of the construction options would result in the unavoidable alteration of approximately 315 linear feet of the man-made Coastal Bank to install the sheet piling and fill structure that would support the approach slab and landward end of the RSA deck. An additional 80 linear feet of the riprap slope would be altered for two emergency access ramps. This would convert a portion of the existing rip-rap bank to a sheet pile bank and two stabilized ramps, and would not affect the functions or significant interests of the Coastal Bank including storm damage prevention and flood control. The new sheet pile bank would maintain the stability of the Coastal Bank beneath the deck.

Coastal Beach

Each of the construction options would result in the alteration of Coastal Beach (the intertidal beach and mud flats) to install the fill structure that would support the approach slab and landward end of the RSA deck, and to install some of the deck pilings. An additional 4,320 square feet of Coastal Beach would be converted to form the base of the two emergency access ramps.

The proposed Runway 33L RSA improvements would not affect the interests of the MA WPA significant to Coastal Beach. The remaining Coastal Beach would continue to contribute to storm damage prevention, flood control, and the protection of wildlife habitat.

Land Containing Shellfish

Each of the construction options would result in the alteration of Land Containing Shellfish (a state-regulated resource area that overlays Coastal Beach and Land Under the Ocean) as a result of placing pilings to construct the RSA improvements and constructing the emergency access ramps. Direct impacts range from 4,780 square feet (Option 3) to 5,495 square feet (Option 5) assuming that all of Coastal Beach and Land Under the Ocean supports shellfish. Distinct areas known to support shellfish, specifically blue mussels (*Mytilus edulis*), were delineated and the impacts calculated. Direct impacts to the blue mussel beds range from 14 square feet (Option 1) to 72 square feet (Option 2). Remaining mussel beds will be undisturbed.



The proposed Runway 33L RSA improvements would affect the interests of the MA WPA significant to Land Containing Shellfish as the proposed improvements would change the distribution of sediment grain size affecting shellfish habitat. Although this area supports very low shellfish densities, the habitat would still be available and it is likely that the Land Containing Shellfish can return to its former productivity following construction.

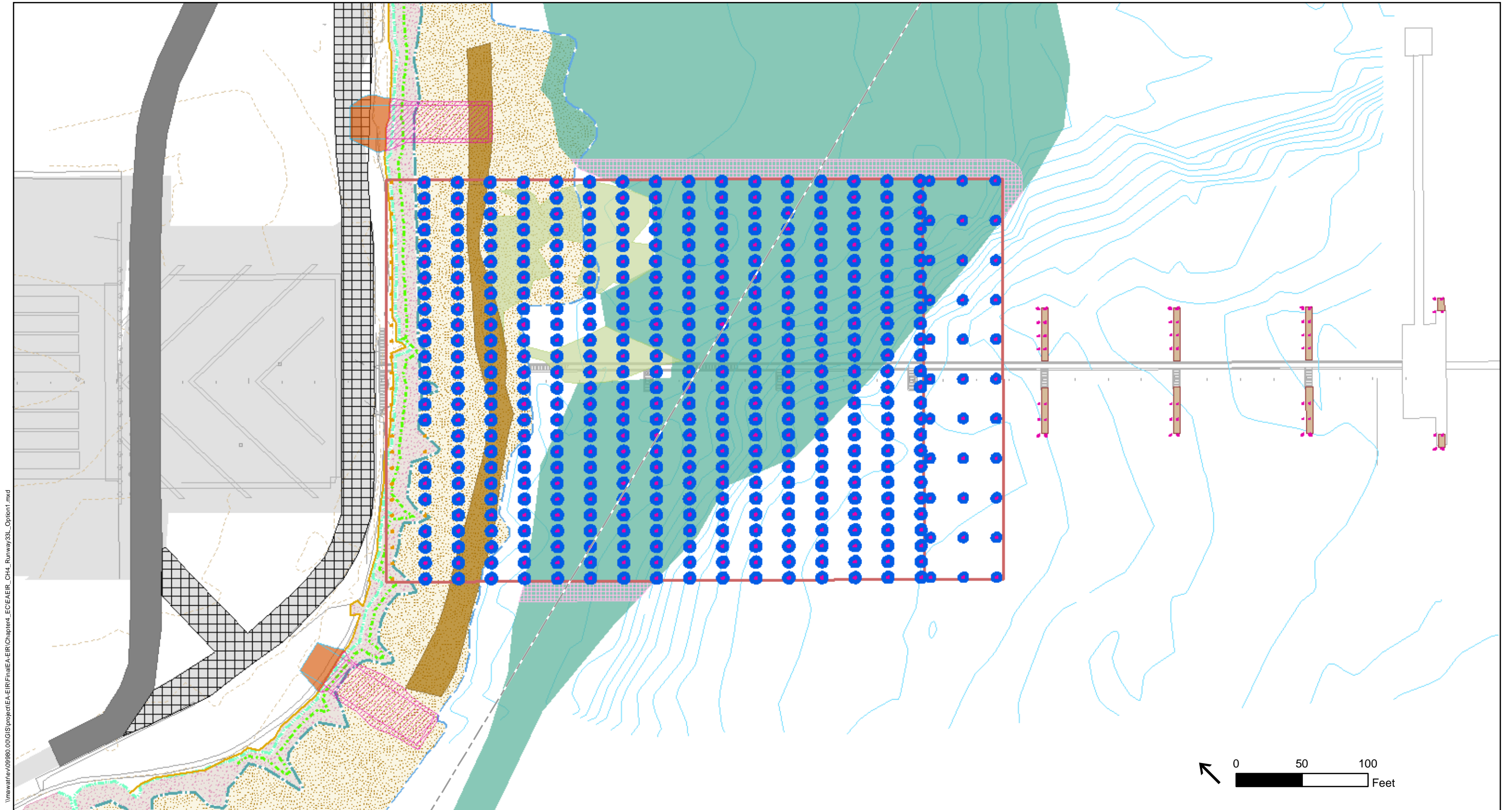
Land Under the Ocean

Each of the construction options would result in the loss of Land Under the Ocean to install pilings needed to support the RSA deck (including the localizer platform/maneuvering area). The area of loss is directly related to the size and number of pilings, and ranges from 395 square feet (Option 3) to 1,045 square feet (Option 5). This represents a loss of 0.27 percent to 0.73 percent of the natural substrate under the entire deck (a total area of 142,410 square feet) assuming that this area was currently entirely a natural substrate. This overestimates the actual impact of the proposed RSA improvements, as the area currently contains the timber-pile supported light pier which would be removed and replaced by the deck and pilings. The existing light pier occupies an area approximately 470 feet long by 20 feet wide (9,400 square feet).

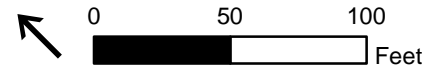
The proposed Runway 33L RSA improvements would affect the interests of the MA WPA significant to Land Under the Ocean, especially the protection of marine fisheries and wildlife habitat. The proposed Runway 33L RSA improvements would result in the loss of eelgrass (as described below), which is important habitat for fish and other marine organisms. Land Under the Ocean at Runway 33L would continue to be significant to storm damage prevention and flood control.

Eelgrass

Eelgrass is a habitat type of the state-regulated Land Under the Ocean. This analysis assumes that all of the eelgrass bed under the RSA deck would be shaded and would no longer receive sufficient light to survive; therefore the entire eelgrass bed under the RSA deck would be lost. Each of the construction options would result in the same impacts to eelgrass, since the size of the RSA (and localizer) deck would be the same in all five construction options. The proposed Runway 33L RSA improvements are anticipated to result in the direct loss of 60,100 square feet of eelgrass due to shading (calculated based on the 303-foot deck width). This somewhat overestimates the actual impact of the proposed RSA improvements, as the area currently contains the timber-pile supported light pier which would be removed and replaced by the deck and pilings.



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| Footprint of Pile-Supported Deck | Direct Impact from Installation of Pipe Piles/Caissons and Timber Piles for Light Pier | Highest High Water (7.3') | Raised Mussel Bed |
| Pipe Piles | Direct Impact from Installation of Emergency Access Ramp | Mean High Water (5.13') | Cobbel Mussel Bed |
| Light Pier Extensions | Additional Eelgrass Shading Impact Area | Mean Low Water (-4.36') | Eelgrass |
| Emergency Ramp | Limit of Land Subject to Coastal Storm Flowage | Top of Coastal Bank | Coastal Bank |
| Relocated Perimeter Road | Airport Property Boundary | Coastal Beach (Intertidal) | |
| Demolished Pavement | Indirect Impact from Scour Around Pipe Piles/Caissons | | |

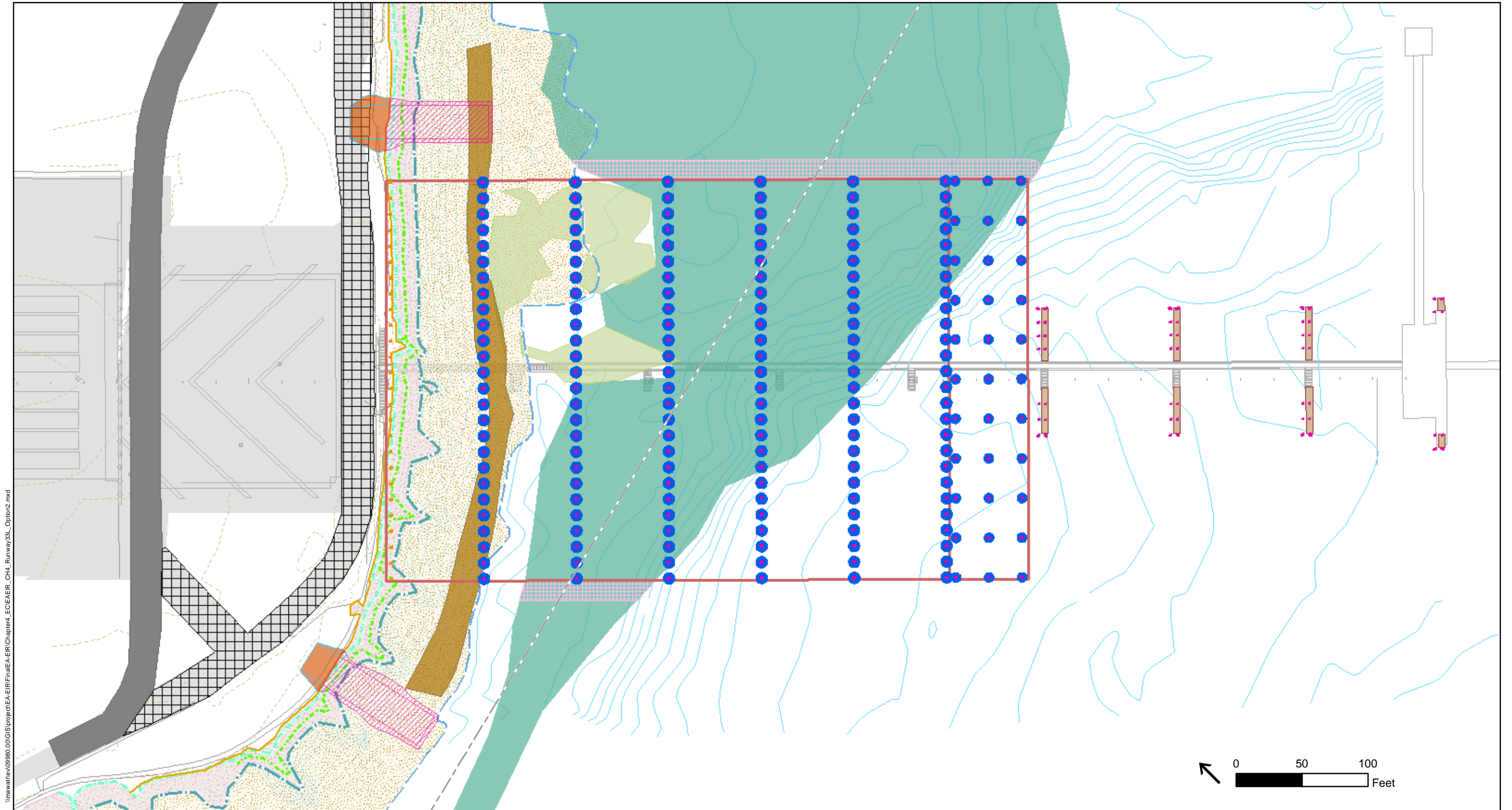
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 Runway Safety Area Improvement Project

Figure 4-1
Runway 33L RSA Option 1
Coastal Wetland Impacts, Eelgrass Shading, and Scour Impacts

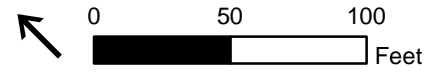
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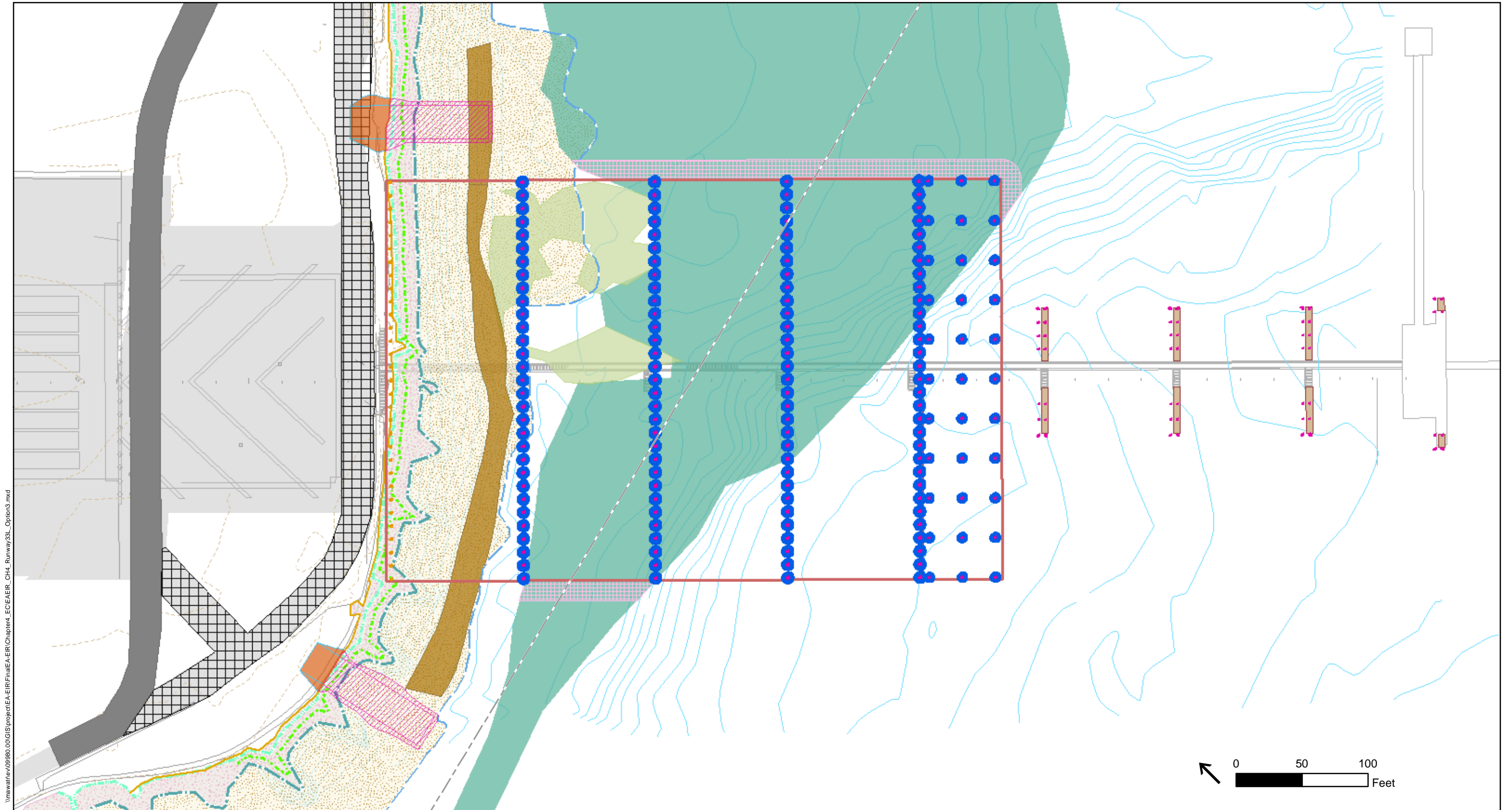
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| Footprint of Pile-Supported Deck | Direct Impact from Installation of Pipe Piles/Caissons and Timber Piles for Light Pier | Highest High Water (7.3') | Raised Mussel Bed |
| Pipe Piles | Direct Impact from Installation of Emergency Access Ramp | Mean High Water (5.13') | Cobbel Mussel Bed |
| Light Pier Extensions | Additional Eelgrass Shading Impact Area | Mean Low Water (-4.36) | Eelgrass |
| Emergency Ramp | Indirect Impact from Scour Around Pipe Piles/Caissons | Top of Coastal Bank | Coastal Bank |
| Relocated Perimeter Road | | Limit of Land Subject to Coastal Storm Flowage | Coastal Beach (Intertidal) |
| Demolished Pavement | | Airport Property Boundary | |

LOGAN AIRPORT RSA Logan RSA
Runway 33L RSA Option 2 Coastal Wetland Impacts, Eelgrass Shading, and Scour Impacts

Source: Applied Science Associates
Childs Engineering Corp.



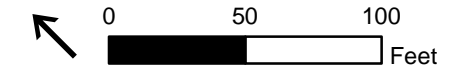
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| Footprint of Pile-Supported Deck | Direct Impact from Installation of Pipe Piles/Caissons and Timber Piles for Light Pier | Highest High Water (7.3') | Raised Mussel Bed |
| Pipe Piles | Direct Impact from Installation of Emergency Access Ramp | Mean High Water (5.13') | Cobbel Mussel Bed |
| Light Pier Extensions | Additional Eelgrass Shading Impact Area | Mean Low Water (-4.36') | Eelgrass |
| Emergency Ramp | Indirect Impact from Scour Around Pipe Piles/Caissons | Top of Coastal Bank | Coastal Bank |
| Relocated Perimeter Road | | Limit of Land Subject to Coastal Storm Flowage | Coastal Beach (Intertidal) |
| Demolished Pavement | | Airport Property Boundary | |



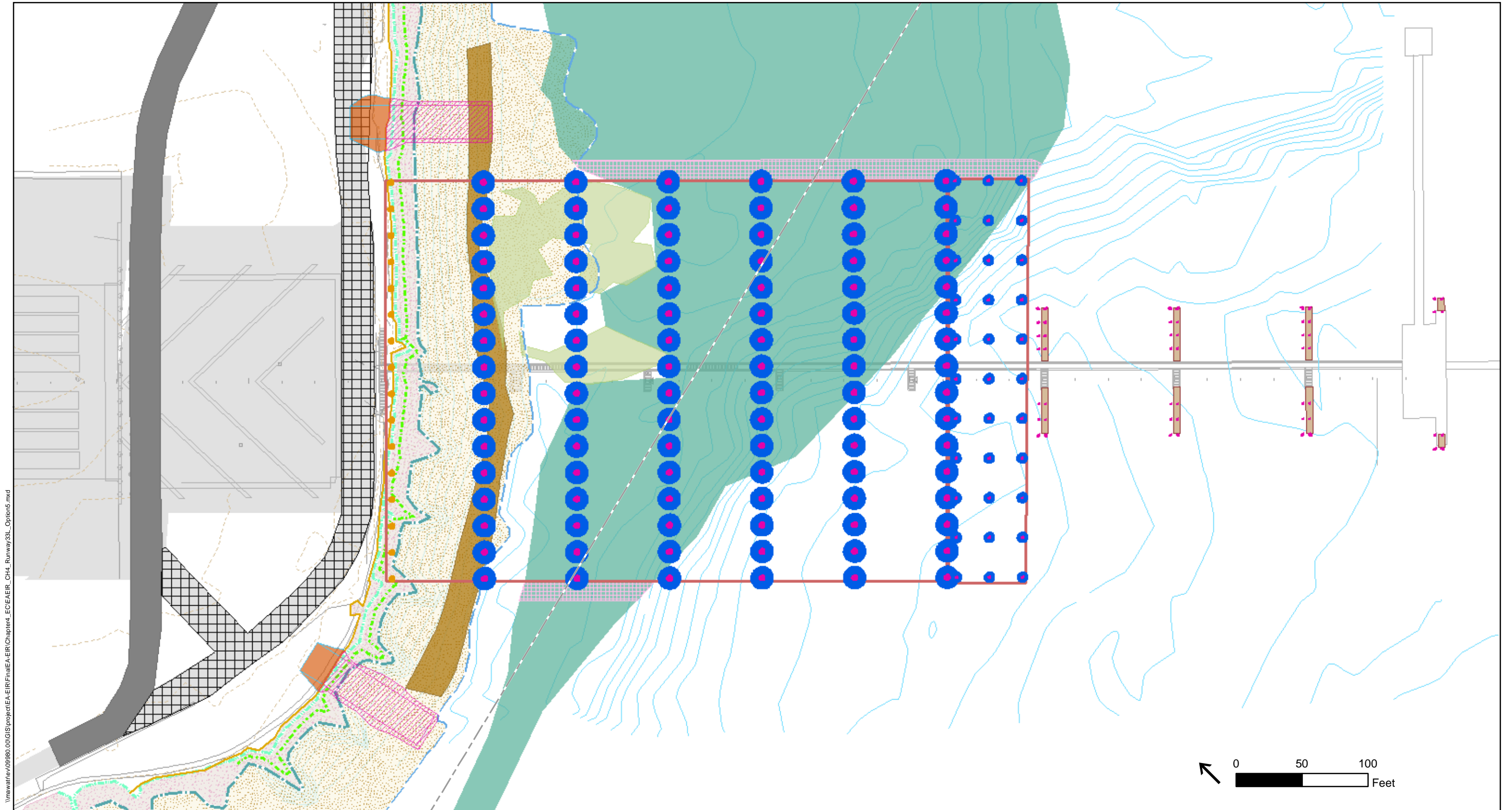
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 Runway Safety Area Improvement Project

Figure 4-3
Runway 33L RSA Option 3
Coastal Wetland Impacts, Eelgrass Shading, and Scour Impacts

Source: Applied Science Associates
 Childs Engineering Corp.



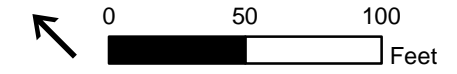
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| Footprint of Pile-Supported Deck | Direct Impact from Installation of Pipe Piles/Caissons and Timber Piles for Light Pier | Highest High Water (7.3') | Raised Mussel Bed |
| Caissons | Direct Impact from Installation of Emergency Access Ramp | Mean High Water (5.13') | Cobbel Mussel Bed |
| Light Pier Extensions | Additional Eelgrass Shading Impact Area | Mean Low Water (-4.36') | Eelgrass |
| Emergency Ramp | Indirect Impact from Scour Around Pipe Piles/Caissons | Top of Coastal Bank | Coastal Bank |
| Relocated Perimeter Road | | Limit of Land Subject to Coastal Storm Flowage | Coastal Beach (Intertidal) |
| Demolished Pavement | | Airport Property Boundary | |



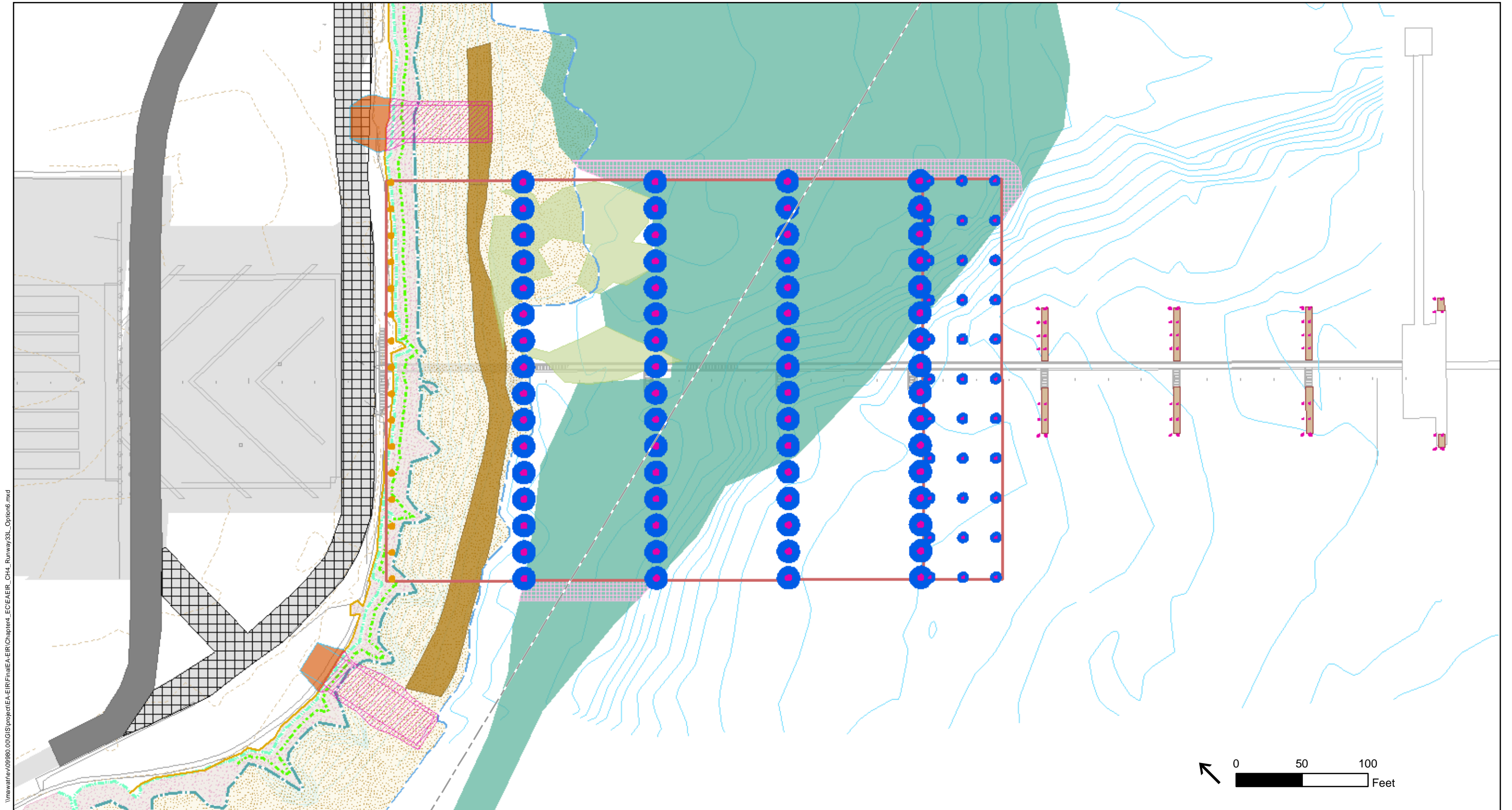
massport **LOGAN AIRPORT RSA** Logan RSA
 Runway Safety Area Improvement Project

Figure 4-4
Runway 33L RSA Option 5
Coastal Wetland Impacts, Eelgrass Shading, and Scour Impacts

Source: Applied Science Associates
 Childs Engineering Corp.



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| Footprint of Pile-Supported Deck | Direct Impact from Installation of Pipe Piles/Caissons and Timber Piles for Light Pier | Highest High Water (7.3') | Raised Mussel Bed |
| Caissons | Direct Impact from Installation of Emergency Access Ramp | Mean High Water (5.13') | Cobble Mussel Bed |
| Light Pier Extensions | Additional Eelgrass Shading Impact Area | Mean Low Water (-4.36') | Eelgrass |
| Emergency Ramp | Indirect Impact from Scour Around Pipe Piles/Caissons | Top of Coastal Bank | Coastal Bank |
| Relocated Perimeter Road | | Limit of Land Subject to Coastal Storm Flowage | Coastal Beach (Intertidal) |
| Demolished Pavement | | Airport Property Boundary | |



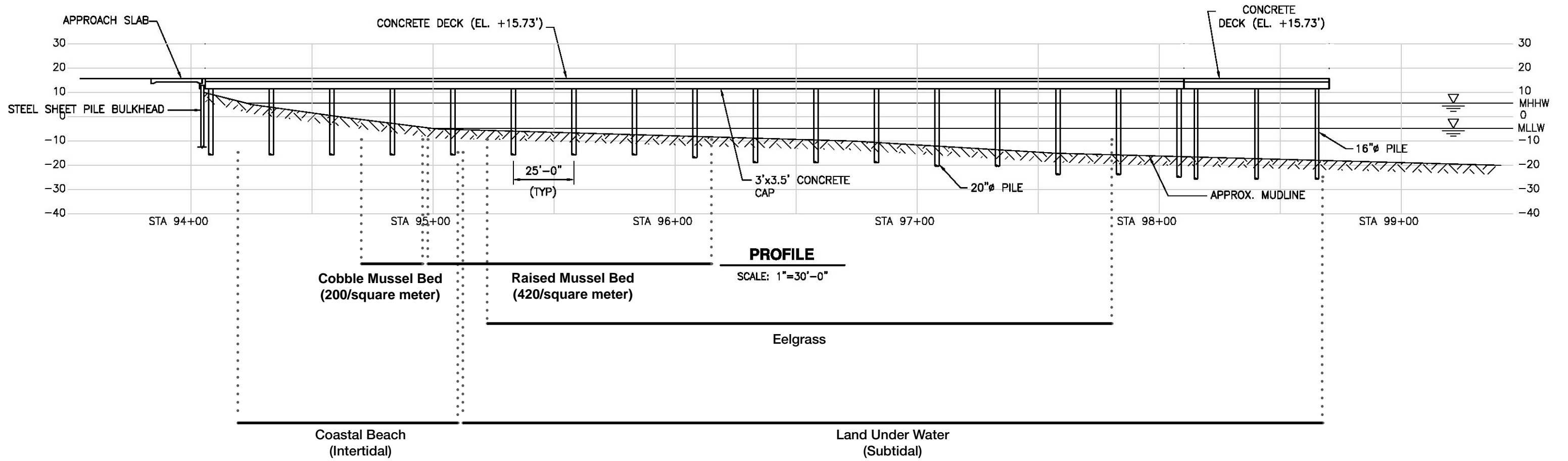
Logan RSA

Figure 4-5
Runway 33L RSA Option 6
Coastal Wetland Impacts,
Eelgrass Shading, and Scour Impacts

Source: Applied Science Associates
 Childs Engineering Corp.



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Note: State-regulated Land Containing Shellfish overlays Coastal Beach and Land Under Water. It is not a separate geographic area.



Logan RSA

Figure 4-6

Runway 33L RSA Impact Cross Section (Option 1)



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Table 4.2-1 Runway 33L RSA Direct Impacts to State-Regulated Wetland Resources

Wetland Resource Area	Option ¹	Direct Impacts				Total
		RSA Deck Piles	Localizer Piles	Light Pier Extension Piles	Emergency Access Ramps	
Coastal Bank (altered due to installation of sheet piling)	1	315 linear feet	0	0	80 linear feet	395 linear feet
	2	315 linear feet	0	0	80 linear feet	395 linear feet
	3	315 linear feet	0	0	80 linear feet	395 linear feet
	5	315 linear feet	0	0	80 linear feet	395 linear feet
	6	315 linear feet	0	0	80 linear feet	395 linear feet
Coastal Beach	1	250 sq.ft	0	0	4,320 sq.ft	4,570 sq.ft
	2	105 sq.ft	0	0	4,320 sq.ft	4,425 sq.ft
	3	65 sq.ft	0	0	4,320 sq.ft	4,385 sq.ft
	5	130 sq.ft	0	0	4,320 sq.ft	4,450 sq.ft
	6	110 sq.ft	0	0	4,320 sq.ft	4,430 sq.ft
Land Under the Ocean	1	755 sq.ft	50 sq.ft	35 sq.ft	0	840 sq.ft
	2	340 sq.ft	50 sq.ft	35 sq.ft	0	425 sq.ft
	3	310 sq.ft	50 sq.ft	35 sq.ft	0	395 sq.ft
	5	960 sq.ft	50 sq.ft	35 sq.ft	0	1,045 sq.ft
	6	690 sq.ft	50 sq.ft	35 sq.ft	0	775 sq.ft
Land Containing Shellfish ²	1	1,005 sq.ft	50 sq.ft	35 sq.ft	4,320 sq.ft	5,410 sq.ft
	2	445 sq.ft	50 sq.ft	35 sq.ft	4,320 sq.ft	4,850 sq.ft
	3	375 sq.ft	50 sq.ft	35 sq.ft	4,320 sq.ft	4,780 sq.ft
	5	1,090 sq.ft	50 sq.ft	35 sq.ft	4,320 sq.ft	5,495 sq.ft
	6	800 sq.ft	50 sq.ft	35 sq.ft	4,320 sq.ft	5,205 sq.ft
Eelgrass ³	1	56,310 sq.ft	3,790 sq.ft	0	0	60,100 sq.ft
	2	56,310 sq.ft	3,790 sq.ft	0	0	60,100 sq.ft
	3	56,310 sq.ft	3,790 sq.ft	0	0	60,100 sq.ft
	5	56,310 sq.ft	3,790 sq.ft	0	0	60,100 sq.ft
	6	56,310 sq.ft	3,790 sq.ft	0	0	60,100 sq.ft

- 1 The analysis considers Options 1, 2, 3, 5 and 6. Option 4 was dismissed due to the magnitude of potential impacts as described in Chapter 2, *Alternatives*.
- 2 This category is the sum of impacts to Coastal Beach and Under the Ocean, designated as Land Containing Shellfish. This is the direct loss of the resource due to pilings.
- 3 Eelgrass impact is the area under deck or localizer or immediately adjacent that would be shaded from sunlight. This area is entirely Land Under the Ocean.



Federally Regulated Section 10 and Section 404 Resources

The following section identifies the federally regulated wetland resources within the Runway 33L project area and the anticipated impacts that would result from construction of the proposed Runway 33L RSA. Table 4.2-2 summarizes the impacts to federally regulated resources, which include Waters of the United States subject to Section 404 of the Clean Water Act and navigable waters subject to Section 10 of the Rivers and Harbors Act.

Intertidal

Each of the construction options would result in the alteration of the intertidal beach and mud flats to install the fill structure that would support the approach slab and landward end of the RSA deck, and to install some of the deck pilings. An additional 4,320 square feet of intertidal land would be converted to form the base of the two emergency access ramps. The federally regulated intertidal area corresponds to the state-regulated Coastal Beach.

Subtidal

Each of the construction options would result in the loss of subtidal land to install pilings needed to support the RSA deck (including the localizer). The area of loss is directly related to the size and number of pilings, and ranges from 395 square feet (Option 3) to 1,045 square feet (Option 5). This represents a loss of 0.27 percent to 0.73 percent of the natural substrate under the deck (a total area of 142,410 square feet) assuming that this area was currently entirely a natural substrate. This overestimates the impact of the proposed RSA improvements, as the area currently contains the timber-pile supported light pier which would be removed and replaced by the deck and pilings. The federally regulated subtidal area corresponds to the state-regulated Land Under the Ocean.

Eelgrass (Submerged Aquatic Vegetation)

Eelgrass beds (submerged aquatic vegetation) are considered to be a Special Aquatic Site under the Section 404(b)(1) guidelines. The impacts are the same as described above for the state-regulated resource.

Totals

As shown in Table 4.2-2, constructing the Runway 33L RSA would result in filling federally regulated aquatic resources, ranging from 4,789 square feet (271.9 cubic yards) for Option 3 to 5,495 square feet (696.9 cubic yards) for Option 5. All options would shade the same area of eelgrass (60,100 square feet).



Table 4.2-2 Runway 33L RSA Direct Impacts to Federally Regulated Resources

Wetland Resource Area	Option ¹	Direct Impacts									
		RSA Deck Pilings		Localizer		Light Pier Extension		Emergency Access Ramps		Total	
		sq. ft.	cu. yd.	sq. ft.	cu. yd.	sq. ft.	cu. yd.	sq. ft.	cu. yd.	sq. ft.	cu. yd.
Intertidal	1	250	50	0	0	0	0	4,320	35.9	4,570	85.9
	2	105	15	0	0	0	0	4,320	35.9	4,425	50.9
	3	65	25	0	0	0	0	4,320	35.9	4,385	60.9
	5	130	55	0	0	0	0	4,320	35.9	4,450	90.9
	6	110	67	0	0	0	0	4,320	35.9	4,430	102.9
Subtidal	1	755	355	50	40	35	31	0	0	840	426
	2	340	150	50	40	35	31	0	0	425	221
	3	310	115	50	40	35	31	0	0	395	341
	5	960	535	50	40	35	31	0	0	1,045	606
	6	690	323	50	40	35	31	0	0	775	394
Total Fill	1	-	-	-	-	-	-	-	-	5,410	511.9
	2	-	-	-	-	-	-	-	-	4,850	271.9
	3	-	-	-	-	-	-	-	-	4,780	401.9
	5	-	-	-	-	-	-	-	-	5,495	696.9
	6	-	-	-	-	-	-	-	-	5,205	496.9
Eelgrass (Shaded) ²	1	56,310 sq. ft.		3,790 sq. ft.		0		0		60,100 sq. ft.	
	2	56,310 sq. ft.		3,790 sq. ft.		0		0		60,100 sq. ft.	
	3	56,310 sq. ft.		3,790 sq. ft.		0		0		60,100 sq. ft.	
	5	56,310 sq. ft.		3,790 sq. ft.		0		0		60,100 sq. ft.	
	6	56,310 sq. ft.		3,790 sq. ft.		0		0		60,100 sq. ft.	

1 The analysis considers Options 1, 2, 3, 5 and 6. Option 4 was dismissed due to the magnitude of potential impacts
 2 Eelgrass impact is the area under deck or localizer or immediately adjacent that would be shaded from sunlight. This area is entirely subtidal.



Federal Resource Functions and Values

Functions and values of coastal wetlands at the Runway 33L end, regulated under CWA Section 404 would be affected by the proposed RSA improvements as described below.

- **Fish and Shellfish Habitat:** Fish and shellfish habitat would still be available after construction of the proposed RSA improvements. Installing pilings would result in the minor loss of natural substrate, and scour could alter the relief elevation and the distribution of the sediment grain size. The pilings, by providing additional habitat for sessile benthic organisms, could increase habitat diversity.

The loss of eelgrass would also affect habitat. Eelgrass beds provide important fish habitat, particularly for larval and juvenile stages. Boston Harbor is designated as Essential Fish Habitat for the larval and juvenile stages of several fish species, including haddock, pollock, whiting, red hake, white hake, winter flounder, yellowtail flounder, windowpane flounder, and American plaice. Eelgrass beds potentially provide shelter from predators and provide food sources. The loss of part of the extensive eelgrass bed between Logan Airport and Deer Island would incrementally reduce the amount of available habitat for these fish species.

- **Production Export:** Production export would be affected by the proposed Runway 33L RSA improvements. Currently, this area (particularly the eelgrass bed) provides food (algae and benthic macroinvertebrates) for wildlife, including birds, and marine organisms. The loss of eelgrass is 3 percent of the total size of this eelgrass bed and would have a proportional impact on production export.
- **Sediment/Shoreline Stabilization:** The proposed Runway 33L RSA improvements would not adversely affect the stability of the shoreline. The proposed improvements would provide similar stability to the existing stable shoreline.
- **Wildlife Habitat:** Wildlife habitat at the Runway 33L end would be altered as eelgrass and shallow coastal beach habitats that provide habitat for a variety of wildlife species would be lost due to shading or pilings. The proposed RSA improvements would not be a barrier to movement for wildlife along the shoreline.

4.2.1.2 Indirect Impacts

Indirect impacts include the potential additional loss of eelgrass or diminished growth of eelgrass due to shading from the proposed RSA deck and localizer deck in areas near but not under the deck. This impact is considered indirect because it would occur in a different location, would occur over time, and would likely occur over a gradient. A potential effect distance of 15 feet on either side of the deck was determined based on literature study⁷ that showed light would be diminished within this 15-foot zone. The five construction options would result in the same potential perimeter shading effect on eelgrass growth, affecting approximately 6,500 square feet of eelgrass.

⁷ Olson, A.M., B. Witherspoon, R. M. Thom, and D.K. Shreffler. 1997. Light Environment and Eelgrass Shading Around Three WSDOT Ferry Terminals. In Washington State Transportation Commission, Mitigation Between Regional Transportation Needs and Preservation of Eelgrass Beds. WA-RD 421.1, Final Report March 1997.



The proposed deck would not cause indirect impacts to Land Containing Shellfish. To evaluate if shading affects blue mussel beds, surveys were completed of several shaded sites, including a 60-foot long culvert and several large piers (the Frazier Memorial State Pier in Plymouth and the John T. Fallon State Pier at Columbia Point in Boston). The surveys showed that blue mussels have improved survival in shaded areas compared to full sun exposure. Within full sun and partial sun exposure areas, mussels were generally observed attached to the sides of rocks or partially buried in the substrate where sunlight exposure was reduced. Under the piers in shade, mussels were more in the open and not restricted to sides of rocks. The presumed benefit of a shady location is reduced heat stress and desiccation on sunny summer days when low tide leaves mussel individuals exposed for several hours. The shading caused by the proposed pier is therefore anticipated to have a beneficial effect to blue mussels, and the productivity of Land Containing Shellfish, at the Runway 33L end.

Indirect impacts also include scour over time resulting from water movement around the piles or caissons underneath the pier. The amount of scour is proportional to the size of the piling (20-inch or 48-inch) and the number of pilings or caissons. Similar to the existing pilings in this area, scour would result in a slight change in the topography (bathymetry) of the Land Under Water (including Land Containing Shellfish and eelgrass beds) in the immediate vicinity of the proposed RSA deck. Indirect impacts due to potential changes to currents within the project area were evaluated using a hydrodynamic model that implements an enhanced friction factor within the deck footprint to represent the impedance to flow caused by the deck support piles.⁸ Indirect impacts due to scour were evaluated using the Federal Highway Administration's Hydraulic Engineering Circular No. 18 (HEC-18).⁹ The HEC-18 method includes an equation for calculating maximum scour depth at circular piles. Scour length was determined based on HEC-18 guidance, which suggests that the downstream length of the scour hole is two times the maximum scour depth. The flow velocities used in the HEC-18 analysis were obtained from the hydrodynamic model, Regional Ocean Modeling System (ROMS), which simulates flow inside Boston Harbor, coupled with the wave model, Simulating WAVes Nearshore (SWAN). Sediment dispersion was also modeled at Runway 33L to determine where marine sediment introduced into the water column during construction would potentially be deposited. The sediment dispersion model SSFATE¹⁰ was used to simulate dispersion and deposition of sediment from construction activities based on currents.¹¹

Sediment deposition resulting from scour would be negligible, as shown on Figure 4-7. As shown in Table 4.2-3 and on Figures 4-1 through 4-5, the total area affected by scour around the permanent pilings would range from approximately 8,350 square feet (Option 3) to 24,750 square feet (Option 1). This minor change in topography would stabilize over time, but could potentially result in a slight change in the capacity of Land Containing Shellfish to support mussel beds in the immediate vicinity of each piling. Scour could also affect the eelgrass bed immediately adjacent to the outer pilings, with a potential loss ranging from 90 square feet to 420 square

8 Luetlich, R.A. and J.J. Westerink. 1999. Implementation of Bridge Pilings in the ADCIRC Hydrodynamic Model: Upgrade and Documentation for ADCIRC Version 34.19. Prepared for the Department of the Army, Coastal Engineering Research Center, Waterways Experiment Station, US Army Corps of Engineers, Vicksburg, MS 39180.

9 Richardson, E.V. and S.R. Davis, 2001. *Evaluating Scour at Bridges*. Fourth Edition. Publication No. FHWA NHI 01-001, May 2001. Federal Highway Administration, U.S. Department of Transportation.

10 SSFATE (Suspended Sediment FATE) was jointly developed by Applied Science Associates and the USACE Environmental Research and Development Center (ERDC) to simulate the sediment suspension and deposition from dredging operations. Its use has extended to include the simulation of cable and pipeline burial operations using water jet trenchers, and mechanical plows, and to simulating the suspended sediment from anchor cable sweeps on the seafloor.

11 Olson, A.M., B. Witherspoon, R. M. Thom, and D.K. Shreffler. 1997. Light Environment and Eelgrass Shading Around Three WSDOT Ferry Terminals. In Washington State Transportation Commission, Mitigation Between Regional Transportation Needs and Preservation of Eelgrass Beds. WA-RD 421.1, Final Report March 1997.



feet. The impacts shown in the table are in addition to the direct loss due to the installation of the pile or caisson. The eelgrass impact due to scour is outside of the footprint of the deck and localizer platform but within the area of potential peripheral shading (within 15 feet of the deck) and therefore, would not result in additional eelgrass loss.

Table 4.2-3 Runway 33L RSA Scour Impact

Construction Option	Coastal Beach (square feet)	Land Under the Ocean (square feet)	Land Containing Shellfish ¹ (square feet)	Eelgrass ² (square feet)
Option 1	5,630	19,120	24,750	230
Option 2	1,840	8,340	10,180	110
Option 3	1,060	7,290	8,350	90
Option 5	3,920	16,350	20,270	420
Option 6	1,830	12,100	13,930	320

Note: Includes the impact resulting from the deck and the localizer.

1 Assumes Coastal Beach and Land Under the Ocean are designated as Land Containing Shellfish. This column sums the impacts for these resources.

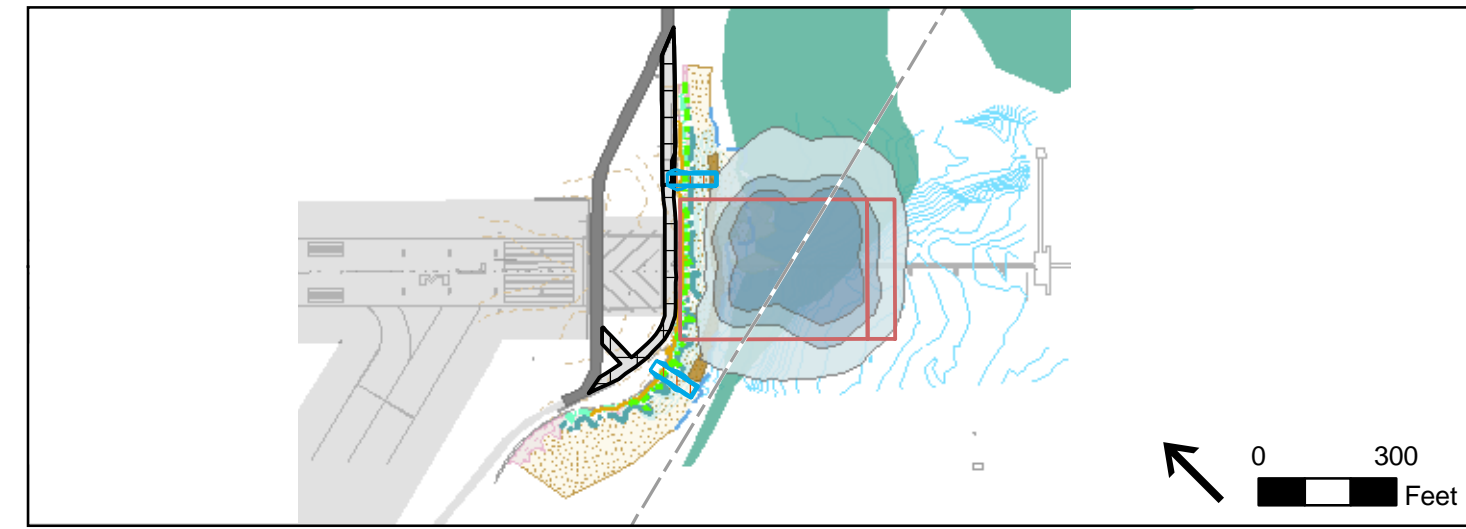
2 The Eelgrass impact is the area outside the footprint of the deck or localizer but within the area of potential peripheral shading.

The proposed Runway 33L RSA improvements would not cause the loss of other functions and values outside the footprint of the improvements:

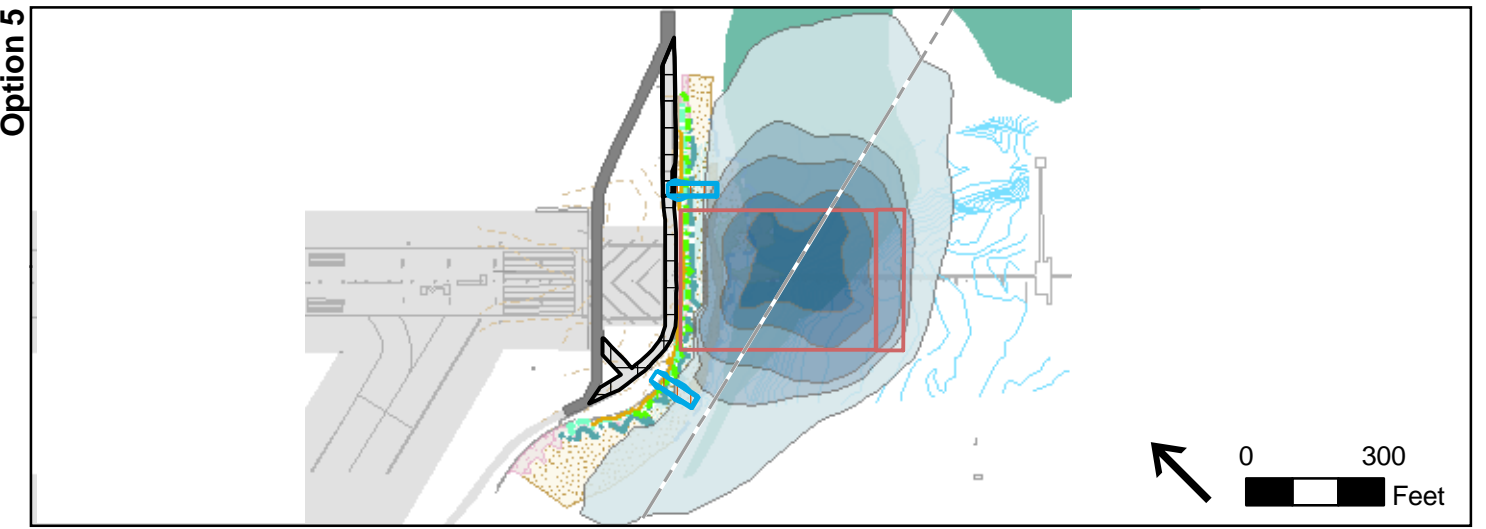
- The proposed Runway 33L RSA improvements would not affect the ability of any wetlands outside of the RSA footprint to recharge or discharge groundwater. This interest is not applicable to coastal wetlands.
- The proposed Runway 33L RSA improvements would not affect floodflow functions or the ability to reduce flood damage of wetlands outside of the RSA footprint, as it would not affect the stability of the coastal bank.

The proposed Runway 33L RSA improvements do not represent a barrier to movement and would not reduce any wetland habitat functions or values outside of the RSA footprint. The RSA would not decrease the ability of other wetlands to provide wildlife, shellfish, or fish habitat:

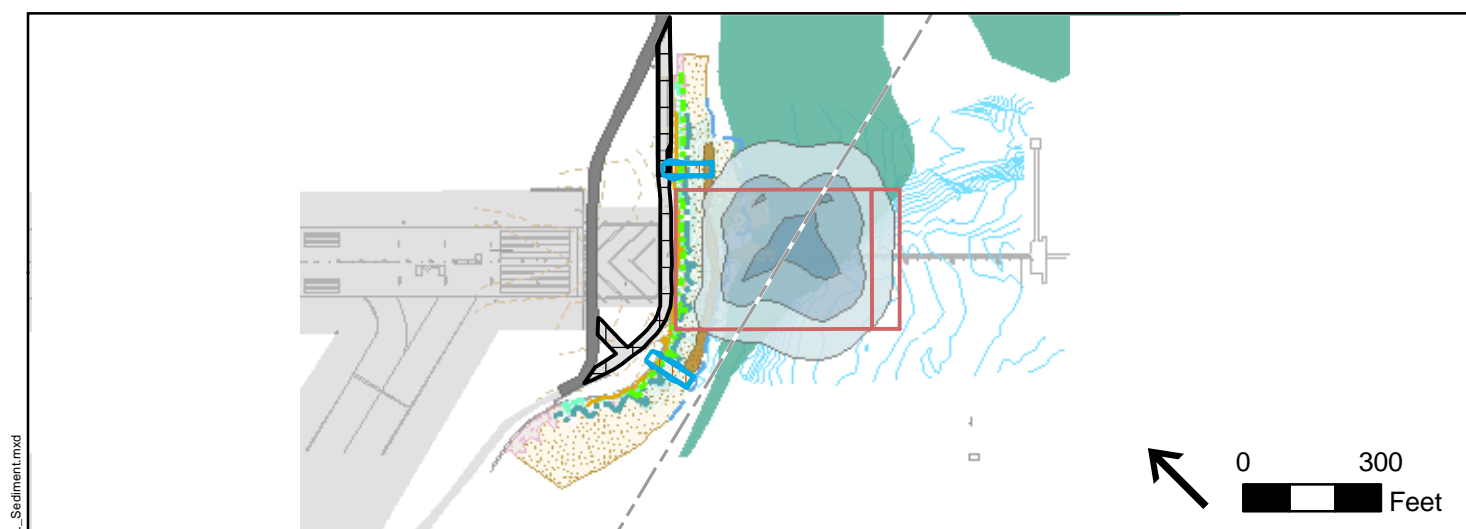
- The proposed Runway 33L RSA improvements would not reduce the ability of wetlands outside of the footprint to remove, retain, or transform nutrients.
- The production export function of wetlands outside of the proposed Runway 33L RSA improvements footprint would not be affected. The RSA improvements would not cause any change to wildlife use, fish and shellfish habitat, vegetation, flushing, or other characteristics of production export.
- The shoreline stabilization function of wetlands outside of the proposed Runway 33L RSA improvements footprint would not be affected. The proposed RSA improvements would maintain the stability of the adjacent shoreline.



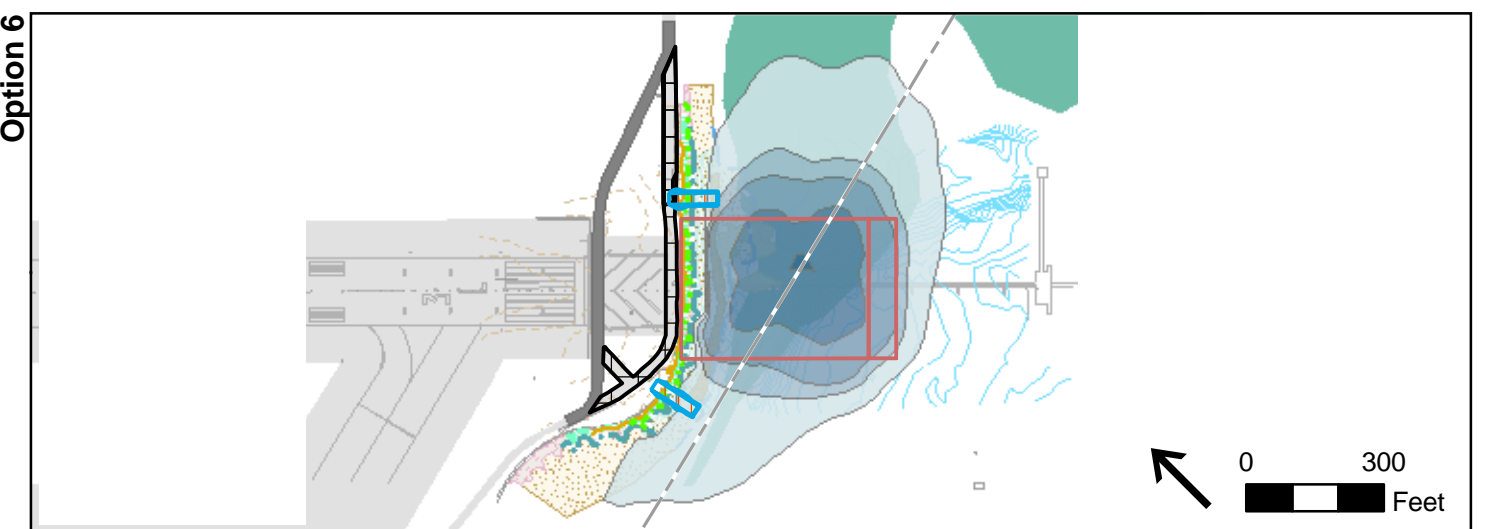
Option 1



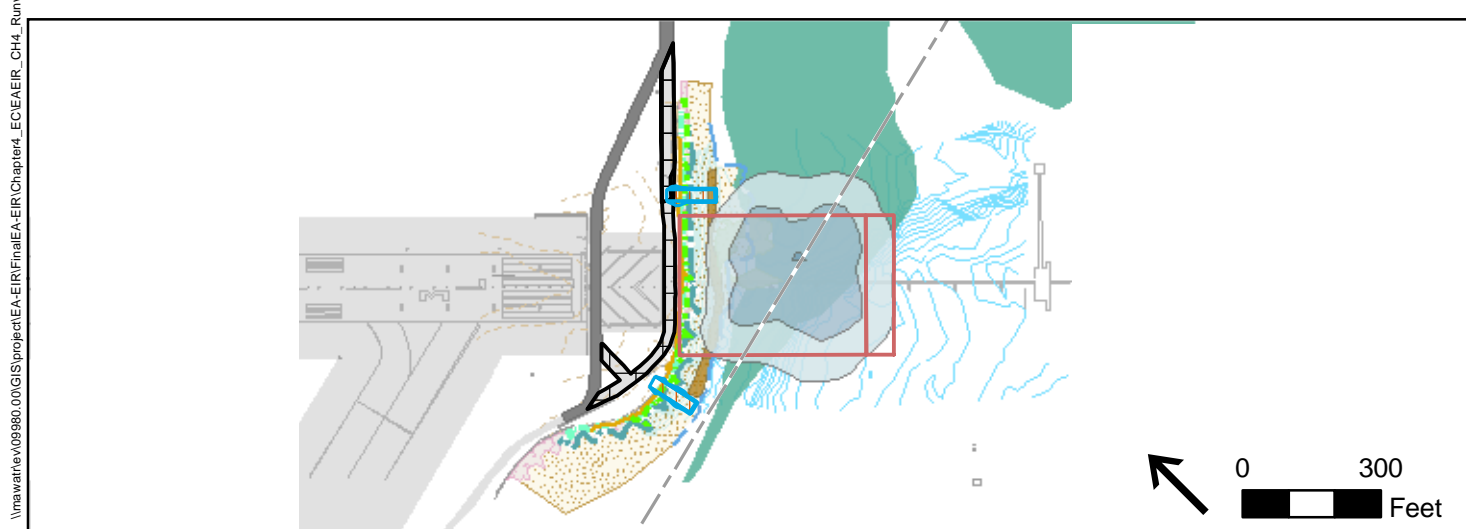
Option 5



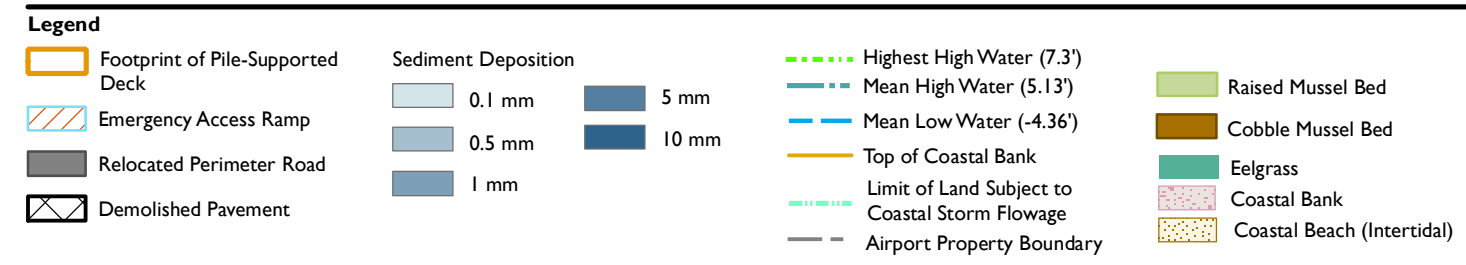
Option 2



Option 6



Option 3



Logan RSA

Figure 4-7
Runway 33L RSA Sediment Deposition

Source: Applied Science Associates
Childs Engineering Corp.



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4.2.1.3 Temporary Construction Impacts

The proposed Runway 33L RSA improvements are anticipated to generate suspended sediment during construction as a result of driving piles or drilling caissons, as discussed in Section 2.2.4. Mooring the construction barges and using spuds to secure the barges at the construction site could also temporarily generate sediment and could temporarily impact benthic organisms and eelgrass. Barge anchor sweep would not occur during construction. Since the construction barges would be secured with spuds, instead of being anchored, there is no potential for additional impacts caused by anchor sweep. While every feasible measure will be taken to minimize the amount of sediment generated, it is likely that construction would result in the release of sediment into the water column. This sediment would be distributed by the tides and currents, and would be redeposited in the vicinity of the work area. Mitigation measures to minimize these impacts are described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

The sediment deposition analysis conducted for the Draft EA/EIR showed that sediment deposits generated by construction activities could range in depth from a maximum of 10 millimeters (mm) (0.4 inches) to less than 0.1 mm (0.004 inches). This deposition is not anticipated to have an adverse effect on the benthic community or shellfish beds, although sediment deposition of 0.5 mm (0.02 inches) or more is considered to have the potential to adversely affect winter flounder eggs.¹² Sediment deposition at the predicted depths is not anticipated to affect the ability of eelgrass to grow. As shown in Table 4.2-4, sediment deposition of 1.0 mm or more is anticipated to occur on Land Under the Ocean in an area ranging from 0 acres (Option 3) to 3.0 acres (Option 6). Sediment deposition of 5 mm would occur over an area of land under the ocean ranging from 0 acres (Options 1, 2, 3) to 2.0 acres (Option 5), and sediment deposition of 10 mm would range from 0 acres (Options 1, 2, 3) to 0.9 acres (Option 5). The areas of sediment deposition overlap with the scour impacts identified in Table 4.2-3. The areas of sediment deposition are not confined to the footprint of the deck and localizer.

¹² Berry, W., E. Hinchey, N. Rubinstein, and G. Klein-McPhee. 2004. *Winter Flounder, Pseudopleuronectes americanus, Hatching Success as a Function of Burial Depth in the Laboratory*. Ninth Flatfish Biology Conference. December 2004. Northeast Fisheries Science Center Reference Document 04-13.



Table 4.2-4 Runway 33L RSA Modeled Sediment Deposition from Construction

Sediment Deposition	Construction Option	Coastal Beach (acres)	Land Under the Ocean (acres)	Land Containing Shellfish ¹ (acres)	Eelgrass ² (acres)
10 mm (0.4 in)	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	5	0	0.9	0.9	0
	6	0	0.1	0.1	0
	5 mm (0.2 in)	1	0	0	0
2		0	0	0	0
3		0	0	0	0
5		0.1	2.0	2.1	0.2
6		0.1	1.6	1.7	0.1
1 mm (0.04 in)		1	0.1	1.6	1.7
	2	0	0.4	0.4	0
	3	0	0	0	0
	5	0.4	2.8	3.2	0.6
	6	0.4	3.0	3.4	0.5
	0.5 mm (0.02 in)	1	0.2	2.4	2.6
2		0.1	1.8	1.9	0.1
3		0.1	1.5	1.6	0.1
5		0.1	3.0	3.1	0.6
6		0.1	2.9	3.0	0.5
0.1 mm (0.004 in)		1	0.4	2.6	3.0
	2	0.4	3.1	3.5	0.6
	3	0.4	3.1	3.5	0.5
	5	0.6	6.4	7.0	2.2
	6	0.5	5.3	5.8	2.0

¹ Assumes Coastal Beach and Land Under the Ocean are designated as Land Containing Shellfish. This column sums the impacts for these resources.

² The Eelgrass construction impact is the area outside the footprint of the deck or localizer. This area is entirely in Land Under the Ocean.



4.2.1.4 Findings

In accordance with FAA *Order 1050.1E*, an action would result in a significant impact to wetlands if it:

- Adversely affects a wetland's functions to protect the quality or quantity of a municipal water supply, including sole source and potable water aquifers;
- Substantially alters hydrology needed to sustain affected wetland values and functions or those of a wetland to which it is connected;
- Substantially reduces the affected wetland's ability to retain floodwater or storm runoff, thereby threatening public health, safety, or welfare;
- Adversely affects the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources in the affected or surrounding wetlands;
- Promotes development of secondary activities or services that causes any of the above impacts; or
- Is inconsistent with applicable state wetland strategies.

As documented in this section, the proposed Runway 33L RSA improvements would not affect water supplies, alter hydrology, affect the ability of the coastal wetlands to protect the public health, safety or welfare, and would not adversely affect the maintenance of natural systems. The Runway 33L RSA improvements would not encroach on a floodplain or affect floodplain values.

With the proposed mitigation for the loss of eelgrass and shellfish resources, the proposed Runway 33L RSA improvements would not result in a significant impact as defined at FAA *Order 1050.1E*. With mitigation, the proposed Runway 33L RSA improvements would meet the criteria for a Variance under the Wetlands Protection Act and comply with the Commonwealth's No Net Loss Policy and would, therefore, be consistent with state wetland strategies.

4.2.2 Waterways and Tidelands

The proposed safety improvements were analyzed to determine potential impacts to coastal waterways and tidelands, in accordance with FAA *Order 1050.1E Appendix A, Section 3.3*. The proposed Runway 33L RSA improvements require the construction of a pile-supported deck partially seaward of the mean high water line on Commonwealth tidelands, which are protected under Chapter 91 and the Massachusetts Coastal Zone Management Program. FAA regulations indicate there is no significant impact threshold identified for coastal resources. The analysis of significant impacts focuses on how a proposed project is consistent or not consistent with a state's coastal zone management program.

The Secretary's Certificate did not require any additional information on impacts to coastal waterways and tidelands. Discussions of how the Project meets the standards for a Chapter 91 Variance and a Public Benefits Determination are included in Chapter 6, *Regulatory Compliance*. Mitigation is discussed in Chapter 5, *Proposed Mitigation and Section 61 Findings*.



4.2.2.1 Direct Impacts

The proposed Runway 33L RSA improvements would have permanent impacts to Chapter 91 waterways and tidelands as described below. Although the physical loss of tideland (based on the footprint of the area of natural substrate replaced by pilings) varies among the options, the options would result in the same deck footprint. The impact to Chapter 91 resources is therefore considered to be the area of the deck footprint seaward of the mean high tide line, approximately 142,410 square feet (3.27 acres). A portion of this (approximately 2,800 square feet) is currently occupied by the timber-pile supported light pier, which restricts public access out to 2,400 feet from the shoreline. The entire project area is within Logan Airport's 500-foot Security Zone as established by Massachusetts General Law (M.G.L.) Chapter 90, Section 61 as described in Section 3.3.3 of Chapter 3, *Affected Environment*.

As documented in Section 3.3.3 of Chapter 3, *Affected Environment*, the only interests currently provided by the proposed RSA area are limited shellfishing, living marine resources, and water quality. The proposed Runway 33L RSA improvements would eliminate the limited shellfishing within the area occupied by the pilings, and would eliminate or reduce the ability of the area to support eelgrass. The proposed RSA deck would not affect the ability of the onshore areas to protect water quality, as further discussed in Section 4.2.5. The existing timber light pier, which will continue to extend approximately 1,930 feet seaward of the end of the proposed deck, eliminates any public use of this area for navigation, as does the legislated security restriction.

4.2.2.2 Indirect Impacts

Indirect impacts were assessed based on the footprint of the pile-supported structure on Chapter 91 tidelands, in the context of the public uses adjacent to Logan Airport. No indirect impacts to waterways or tidelands, or public uses, are anticipated. The proposed pile-supported deck would not affect the public's right on tidelands elsewhere in Boston Harbor because the proposed Runway 33L RSA improvements do not require closing tidelands elsewhere in Boston Harbor.

4.2.2.3 Temporary Construction Impacts

Temporary construction-related impacts to tidelands and waterways would be limited to temporary occupancy of a portion of the tidelands by construction barges. As described in Chapter 2, *Alternatives*, construction materials and equipment would be transported to the work area by barge, and barges containing large construction equipment (cranes, pile drivers, etc.) would be moored near the construction area. The proposed mooring areas are within shallow on-shore waters and within Logan Airport's Security Zone.

4.2.2.4 Findings

Chapter 91 waterways and tidelands are a state-regulated resource with no comparable federal regulated resource. There are no FAA NEPA criteria for significant impacts for tideland resources. As documented in this section, the proposed Runway 33L RSA improvements would not affect the public's interests in tidelands. The MA DEP found that there are no alternatives that allow the project to be in compliance with 310 CMR 9.00, the project minimizes the interference with public interests and proposes mitigation to compensate for any



remaining detriments, and the project is necessary to accommodate an overriding regional, state and/or federal interest.¹³

4.2.3 Fish, Wildlife and Plants

This section includes a discussion of the environmental consequences of the proposed Runway 33L RSA improvements on fish, wildlife, and plants. NEPA regulations that address fish, wildlife, and plants are discussed in FAA *Order 5050.4B* and in FAA *Order 1050.1E*. FAA *Order 1050.1E Appendix A, Section 8.3*, identifies the significant impact thresholds related to fish, wildlife, and plants.

The Secretary's Certificate requires the Final EA/EIR to provide the following:

- Results of a survey of other large piers in the area to better understand the condition of underlying shellfish and benthic habitats;
- A discussion of refining the Preferred Alternative in an effort to minimize impacts to flora and fauna;
- A discussion of methodology for further assessing impacts to shellfish developed in consultation with the Working Group; and
- A discussion of expected impacts to shellfishing and mitigation for those impacts.

Potential shellfish and eelgrass mitigation measures are identified in Chapter 5, *Proposed Mitigation and Section 61 Findings*. A description of the ongoing coordination with the resources agencies is provided in Chapter 5, *Proposed Mitigation and Section 61 Findings*, and in Chapter 7, *Public and Agency Involvement*.

4.2.3.1 Direct Impacts

There would be permanent impacts to fish, wildlife, and plants as a result of the proposed Runway 33L RSA improvements. The construction of the pile-supported deck requires installing piles and/or caissons, which would result in the loss of habitat for fish and benthic organisms (shellfish, crabs, and other invertebrates) as well as plants. Section 3.3.4 of Chapter 3, *Affected Environment*, describes the existing fish, wildlife and plants found in the vicinity of the proposed Runway 33L RSA improvements.

Fish and Benthic Organisms

A small amount of habitat that could be used by fish species (approximately 3.27 acres), including the 18 species for which Boston Harbor is designated as EFH, would be altered by the proposed pilings and shaded by the deck. These changes are not anticipated to have permanent effects on fish habitat at the Runway 33L end, and there are no anticipated permanent effects on EFH. The National Marine Fisheries Service (NMFS) concurs that all practicable alternatives to avoid and minimize impacts to the aquatic environment have been considered for

¹³ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Department of Environmental Protection, dated September 2, 2010.



Runway 33L.¹⁴ Although NMFS finds that all practicable alternatives to avoid and minimize impacts have been considered, the agency also finds that there is an adverse impact to EFH due to filling intertidal mud flat and shading eelgrass.¹⁵ The mitigation plan for eelgrass, salt marsh, and intertidal mudflats, all resources used for spawning, foraging, and shelter, is described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

The proposed Runway 33L RSA improvements would replace a portion of the Coastal Beach/Tidal Flat present at Runway 33L with pilings. This would eliminate habitat for certain benthic organisms such as soft-shelled clams (*Mya arenaria*), razor clam (*Ensis directus*), sand shrimp (*Crangon septemspinsa*), mud snails (*Ilyanassa obsoleta*), green crab (*Carcinus maenas*), and polychaetes (*Nereis virens*, *Pectinaria gouldii*). However, the pilings could provide attachment substrate for other benthic organisms. The proposed structure would not be a barrier to wildlife movement along the shoreline. The small amount of habitat lost due to deck pilings is minor, and there is available habitat elsewhere on Logan Airport property and throughout Boston Harbor.

Shellfish

As documented in Section 4.2.1, the loss of subtidal substrate would be small in comparison to the available substrate in the immediate area, with the loss of 395 square feet (Option 3) to 1,045 square feet (Option 5). This represents a loss of 0.27 percent to 0.73 percent of the natural substrate under the deck (a total area of 142,410 square feet). The raised mussel bed and the rocky intertidal area which supports mussels described in Chapter 3, *Affected Environment*, would also be impacted by the installation of piles to support the proposed deck. The combined impacts range from 24 square feet (Option 3) to 176 square feet (Option 5) as identified in Table 4.2-5. This is the impact to the actual mussel beds, and is smaller than the state-regulated resource area, Land Containing Shellfish, as described in Section 4.2.1.

Like the existing pier, the new pilings will provide a substrate that is suitable for some benthic organisms (mussels, anemones, sponges, barnacles, etc) and could provide a habitat enhancement for these species. If the pilings were available as mussel substrate, the Runway 33L pier would increase mussel habitat by approximately 6,800 square feet (Option 3) to 19,900 square feet (Option 1), depending on the construction option selected. Table 4.2-5 provides an overview of the loss of mussel beds due to pile installation compared to the addition of piling surface area as a potential mussel substrate.

¹⁴ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated September 2, 2010.

¹⁵ *ibid.*



Table 4.2-5 Runway 33L Impacts to Mussel Habitat

Construction Option	Loss of Mussel Habitat ¹	New Habitat Available on Piles (Deck and Localizer) ²
Option 1	112 sq. ft.	19,900 sq. ft.
Option 2	53 sq. ft.	8,100 sq. ft.
Option 3	24 sq. ft.	6,800 sq. ft.
Option 5	176 sq. ft.	12,000 sq. ft.
Option 6	62 sq. ft.	10,500 sq. ft.

Note: Represents the impact resulting from the deck only. The piles proposed for the localizer deck do not impact shellfish.

1 This column sums the impact to the raised mussel bed and the rocky intertidal area that supports dense mussel growth.

2 This column represents the surface area of new piles between the sea floor and mean high water.

As described in Chapter 3, *Affected Environment*, the densities of soft-shell clams at the Runway 33L end are very low and this area is not known to be regularly harvested. Based on these findings, the population of harvestable soft shell clams is small and the resulting impacts to shellfish harvesting would not be significant. However, at a meeting held with badged shellfishers who are authorized to dig clams in the conditionally restricted flats adjacent to Logan Airport, the shellfishers suggested that the area off of Runway 33L, known as Apple Island, supports reproduction of soft-shell clams and is a seed source for other clam beds in the vicinity.

Wildlife (Birds and Mammals)

There are no anticipated permanent impacts to wildlife (birds, mammals) as the loss of habitat is minor. Wildlife can use similar habitat on Airport property or elsewhere in Boston Harbor. The construction of Taxiway C1 Connector would occur within the periphery of the mapped habitat of the upland sandpiper (*Bartramia longicauda*), the Massachusetts-listed endangered species known to occur at locations within the grassy interior of the airfield. The Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP) indicated that, with respect to the work proposed under the MA WPA, the proposed Project would not adversely affect the actual resource area habitat for upland sandpiper, a state-protected species, and that the proposed Runway 33L and Runway 22R safety improvements would not result in a “take” of state-listed rare species.¹⁶ The minor loss of aquatic habitat is not anticipated to affect shorebirds or waterfowl.

Plants

The proposed Runway 33L RSA improvements would not affect any terrestrial vegetation other than mowed grasses. Impacts to aquatic plants would include the loss of habitat for marine alga. As described above, this is a negligible loss of habitat and would not be expected to adversely impact the local population of these species in Boston Harbor. The loss of eelgrass is described in Section 4.2.1. The affected area (approximately 60,100 square feet of direct impact plus an additional potential 6,500 square feet with reduced growth due to peripheral shading, for a total of 66,600 square feet) represents approximately 3 percent of the total eelgrass bed (54 acres) present off of Logan Airport. This loss of a portion of the eelgrass bed is not anticipated to have further impacts on the health or long-term viability of this eelgrass bed, which has been documented to have increased

¹⁶ Letter received from the Massachusetts Natural Heritage and Endangered Species Program dated March 26, 2010. NHESP’s letter does not address the potential impacts of Taxiway C1 Connector. Massport will clarify this issue with NHESP. If an impact to endangered species habitat is identified by NHESP, Massport will work with NHESP to address that impact.



substantially in extent over the last decade (see Section 3.4.1 of Chapter 3, *Affected Environment*). Although Massport will require that the contractor avoid and minimize impacts to eelgrass, the use of barges for construction of the Runway 33L RSA may result in additional temporary impacts: Massport has committed to post-construction monitoring and restoration of any temporary impacts (which cannot be precisely estimated in advance), as documented in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

4.2.3.2 Indirect Impacts

Indirect impacts are the potential effects of the structure on the movement of wildlife, population effects due to changes in food sources, and other potential changes that would affect fish or wildlife populations in the vicinity of Logan Airport.

Indirect impacts to fish could result from the loss of a portion of the eelgrass bed in the project area. As discussed in Section 3.3.4 of Chapter 3, *Affected Environment*, eelgrass beds provide important fish habitat, particularly for larval and juvenile stages. Boston Harbor is designated as EFH for the larval and juvenile stages of several fish species, including haddock, pollock, whiting, red hake, white hake, winter flounder, yellowtail flounder, windowpane flounder, and American plaice. Eelgrass beds potentially provide shelter from predators and provide food sources. The loss of part of the extensive eelgrass bed between Logan Airport and Deer Island would incrementally reduce the amount of available habitat for these fish species. However, the proposed RSA improvements are not anticipated to affect the persistence of these fish populations in Boston Harbor.

As described in Section 4.2.1.2, shading is not anticipated to have indirect adverse effects on blue mussels or shellfish habitat productivity. Surveys performed in the Boston Harbor vicinity indicated that mussels had improved survival in shaded areas compared to full sun exposure. At a meeting with state and federal resource agencies, DMF representatives expressed a concern that the new pilings could be colonized by invasive tunicates which could spread and adversely affect the blue mussel beds under the deck. There is no evidence in Boston Harbor of invasive tunicates (*Didemnum vexillum*) currently colonizing pilings or adjacent shellfish beds, indicating that this indirect adverse effect is not predictable at this time. The mitigation chapter outlines a monitoring program to evaluate the use of pilings by shellfish and invasive species.

4.2.3.3 Temporary Construction Impacts

Construction could result in temporary impacts to fish, benthic invertebrates, and plants as a result of several activities. As discussed in Section 4.2.1, construction is anticipated to generate suspended sediment which would, after a short time in the water column, settle on the bottom at depths up to 10 mm (0.4 inches) over a small area. This sediment could clog the gills of fish and benthic invertebrates, affecting their respiratory function. Sediment could also settle on blades of eelgrass, affecting their ability to photosynthesize and grow. These impacts would be short-term and are not anticipated to result in any long-term disruption of growth or population dynamics.



To protect EFH in this area, Massport will not undertake construction between February 15th and June 30th, the DMF- and NMFS-recommended time of year restriction for in-water, silt-producing work for the protection of winter flounder (*Pseudopleuronectes americanus*) using nearshore areas for spawning, larval settlement, and juvenile development.¹⁷ Winter flounder is one of the fish species for which Boston Harbor is designated as EFH.

Construction equipment (barges, cranes, pile-drivers, etc.) would operate in the vicinity of Runway 33L. The resulting activity and noise would likely cause fish to avoid the work area. Construction, particularly pile-driving, can generate high noise levels underwater that could potentially harm fish species in close proximity.

For all of the construction options, underwater noise levels within 20 meters (66 feet) of the construction activity could affect the behavior of fish, likely causing fish to avoid the construction area during pile-driving activities. Although Options 1, 2, and 3 (20-inch steel piles installed using an impact hammer) would exceed the injury threshold for fish (205 dB) within 10 meters (33 feet) of pile-driving activities, fish are not likely to be within this close proximity to the pile-driving because the lower noise levels farther away from the activity would cause fish to avoid the area. Options 5 and 6 (48-inch drilled caissons, advanced using a vibratory hammer) would not exceed the injury thresholds for peak or cumulative noise levels. Findings

While there is no specific significance threshold established for species not protected under the federal Endangered Species Act, FAA *Order 1050.1E* requires the FAA to consider the project's effects on non-listed species population dynamics, sustainability, reproduction rates, natural and artificial mortality (aircraft strikes), and the minimum population size needed to maintain the affected population.

The analysis in this section shows that the proposed Runway 33L RSA improvements together with the mitigation measures would not significantly impact fish, wildlife, and plants because the alternatives would not reduce the habitat size below the level sufficient to sustain species commonly found in the affected area or adversely impact sensitive habitat supporting floral or faunal species not commonly occurring in the affected area.

4.2.4 Federally Listed Threatened and Endangered Species

This section summarizes environmental consequences of the proposed RSA improvements to federally listed threatened or endangered species protected under the Endangered Species Act (ESA) that may occur in the vicinity of the proposed Runway 33L RSA improvements. The Draft EA/EIR provided a detailed analysis of impacts to federally listed threatened or endangered species. NEPA regulations that address threatened and endangered species are discussed in the FAA *Order 5050.4B* and in FAA *Order 1050.1E*. FAA *Order 1050.1E Appendix A, Section 8.3*, identifies the significant impact thresholds related to federally listed threatened or endangered species.

¹⁷ Comment Letter on the ENF received from the Massachusetts Division of Marine Fisheries, dated August 7, 2009.



The U.S. Fish and Wildlife Service (USFWS) indicated that there are no federally listed threatened or endangered species under its jurisdiction within the Project area.¹⁸ NMFS has indicated that sea turtles, protected under the ESA, may occur within Boston Harbor and requested that the FAA undertake an ESA Section 7 Consultation.¹⁹ Prior to the filing of the Draft EA/EIR, the FAA made a preliminary determination that the proposed pile-supported deck is not likely to adversely affect any threatened or endangered species listed under the jurisdiction of NMFS.^{20, 21} NMFS concurred with the FAA's determination, and indicated that the ESA Section 7 Consultation is complete and that the Runway 33L RSA would not adversely affect sea turtles or whales.²² Although the Secretary's Certificate on the Draft EA/EIR required further discussion of the impacts to sea turtle habitat, no further analysis was conducted subsequent to the NMFS finding.

FAA *Order 1050.1E* defines a significant impact for endangered species as one when the USFWS or NMFS determines a proposed action would likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat. As documented in this section and attached correspondence, the FAA has determined, and NMFS has concurred, that the proposed Runway 33L RSA improvements would have an effect, but not an adverse effect, on the habitat of sea turtles. These safety improvements would not have a significant effect on endangered species.

4.2.5 Water Quality

Evaluating water quality is a necessary component of the federal review as required by the FAA NEPA regulations. NEPA regulations that address water quality are discussed in FAA *Order 5050.4B* and in FAA *Order 1050.1E*. FAA *Order 1050.1E Appendix A, Section 17.3*, identifies the significant impact thresholds related to water quality.

The Secretary's Certificate required that the Final EA/EIR evaluate the Runway 33L RSA improvements design, potential impacts to water quality, and the proposed Runway 33L RSA improvement's compliance with the Massachusetts Stormwater Standards. Specifically, the Certificate requires the Final EA/EIR to:

- Evaluate the Environmentally Sensitive Site Design, including Low Impact Development measures;
- Evaluate whether runoff from the proposed deck can be recharged to groundwater;
- Include results of sediment sampling that occurred at Runway 33L end; and
- Demonstrate that the proposed project will be designed to comply with applicable Stormwater Policy Standards (see Chapter 6, *Regulatory Compliance*).

18 Letter received from the United States Fish and Wildlife Service, New England Field Office, dated December 19, 2007.

19 Letter received from the National Marine Fisheries Service, dated March 24, 2010.

20 Letter to National Marine Fisheries Service from the Federal Aviation Administration, dated March 22, 2010.

21 Vanasse Hangen Brustlin, Inc. Assessment of Sea Turtles and Whale Presence within the Boston Harbor Technical Memorandum, dated February 12, 2010.

22 Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated July 26, 2010.



A discussion of the proposed Runway 33L RSA safety improvement's regulatory compliance with water quality regulations, including the Massachusetts Stormwater Management regulations, and the applicable Stormwater Policy Standards is provided in Chapter 6, *Regulatory Compliance*. Mitigation measures to protect water quality during construction and post-construction are presented in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

4.2.5.1 Direct Impacts

The proposed safety improvements would occur in developed portions of the airfield near the end of Runway 33L and intertidal and subtidal areas within Boston Harbor. Because airport operations will not change as a result of the proposed project, direct impacts to water quality are potentially associated only with stormwater management practices on RSA deck and any changes to currents and sediment transport within near-shore waters adjacent to the deck.

All of the proposed pier construction options would have the same water quality impacts. The differences between the piling configurations, which are unique to each option, would have a negligible impact on water quality. Logan Airport's existing drainage areas and associated stormwater outfalls would not be affected by the construction of the proposed Runway 33L RSA improvements.

Direct impacts to water quality result from the changes to hydrology and any new pollutant loading that may occur as a result of the proposed Runway 33L RSA improvements. Potential impacts to water quality are closely linked to changes in the composition, volume, and rate of stormwater runoff for projects that do not involve new water withdrawals or point-source discharges. Evaluation of water quality impacts typically considers increases in stormwater runoff, decreases in infiltration, and changes in the concentrations of constituents contained within the runoff. Impervious surfaces such as runways, perimeter roadways, and RSAs were evaluated to determine the hydraulic and hydrologic characteristics under existing conditions. Because all runoff from the Airport discharges to tidal waterbodies, peak rate control is not a water quality consideration as long as stormwater outfalls are designed to manage discharges without causing erosion. Changes to infiltration and recharge are not water quality considerations because subsurface conditions at the Airport are not conducive to infiltration and groundwater levels are tidally influenced.

Potential impacts were evaluated by comparing the existing stormwater management system and its impacts on water quality with the stormwater management features of the proposed Runway 33L RSA improvements. Construction period impacts resulting from sediment disturbances due to construction activities were also evaluated using the SSFATE model. This analysis determined that the suspended sediment contours for a single caisson auguring event under all possible tide conditions represents a worst-case scenario.

Proposed Drainage System

The five piling construction options would have the same drainage system and potential effects on stormwater in the vicinity of Runway 33L (see Table 4.2-6). Rain that falls on the surface of the deck-based portion of the RSA will not result in an increase of runoff volume to the Harbor, will not be detained and will be discharged to the Harbor, closely matching the existing hydrology of the site and will not increase freshwater inputs to the habitat. Based on the current conceptual design, stormwater runoff from the deck will be collected by scuppers



located along the northeast and southwest edges of the deck. These scuppers will convey runoff from the surface through the deck and will direct flows away from the supporting structure. Scuppers and other drainage infrastructure for the deck will be designed in accordance with the Federal Highway Administration’s Design of Bridge Deck Drainage, Hydraulic Engineering Circular No. 21 (HEC-21).²³ HEC-21 provides guidance for designing safe drainage systems for bridges and other similar structures, and includes a discussion of discharge requirements. From a construction perspective, the proposed deck and pilings closely resemble a bridge.

All runoff from the deck will be discharged through scuppers onto the water sheet of Boston Harbor. Scuppers will be distributed along each side of the deck. Stormwater runoff from the deck will not erode sediments adjacent to the deck because discharge will be distributed and will only occur at locations that are inundated throughout the tidal cycle (will not fall onto exposed coastal beach or mud flats during any tide cycle). The distance of fall between the scupper discharge and the water surface will depend on which portion of the tidal cycle coincides with the rainfall event. At high tide, discharge from the scuppers would free fall approximately 3 feet to the surface of open water that would be between 10 and 23 feet deep depending on the location of the scupper. At low tide, discharge from the scuppers would free fall approximately 13 feet to the surface of open water which would be between 1 and 14 feet deep. Energy dissipation occurs as water discharged by the scupper falls through the air and when it encounters standing water below the pier.

Table 4.2-6 Proposed Runway 33L RSA Stormwater Management

Element	Existing Cover Type	New Impervious Area	Stormwater Management
RSA Deck ¹	Open Water	3.4 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 rip rap slope	0.3 acres	Drains to Boston Harbor via overland flow
Taxiway C1 Connector	Grass Infield	1.8 acres	Existing infield catch basins collect stormwater runoff and discharge to Boston Harbor via Outfalls A-31 and A-32.

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.

Massport has evaluated other options raised by MA DEP for stormwater management and determined that it is not feasible to pipe the runoff from the deck back onto the land and treat the stormwater on land, and not necessary because the stormwater is considered clean and does not change the runoff rates. FAA design requirements for EMAS, RSAs, and approach lights require that the EMAS and RSA be flat and at the same elevation as the runway. The deck and runway elevation are at approximately 15 feet (NAD 1983). If the deck was constructed with a closed drainage system, the pipes would be beneath the deck and stormwater would need to be pumped to reach the existing closed drainage system on the airfield. Stormwater would then be

²³ Young, G.K., S.E. Walker, and F. Chang. 1993. *Design of Bridge Deck Drainage*. Publication No. FHWA-SA-92-010, May 1993. Federal Highway Administration, U.S. Department of Transportation.



discharged through the airfield outlets, without treatment – accomplishing the same result as the proposed drainage system. If the deck was sloped to direct all runoff by sheet flow to the land, the end of the deck would be raised and would be substantially higher than the runway, and thus not permitted by FAA.

Two emergency access ramps are proposed; one on either side of the proposed deck. Because the emergency access ramps would likely consist of articulated, open cell concrete mats over a compacted gravel bed, both of which are materials with high infiltration rates, 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 will not receive any vehicular traffic. No TSS or other pollutants would be generated or captured by the emergency access ramps other than through the normal atmospheric deposition.

Runoff from the perimeter roadway and portions of the existing Runway 33L RSA do not currently enter the closed drainage system and sheet flow across the rip rap slope into Boston Harbor. Overland sheet flow from the RSA and adjacent areas do not constitute regulated discharges under the NPDES permit. The construction of the upland portion of the Runway 33L RSA would result in minor changes to stormwater runoff in by adding impervious area (0.3 acres) in upland areas that are currently pervious. Runoff from these portions of the Runway 33L RSA project area will continue to drain via overland flow into Boston Harbor. Because the shoreline in this location is protected from erosion with poured concrete cement, stone rip rap, and placed boulders, and the runoff from these areas contains negligible quantities of pollutants, these changes will not impact wetland resources. The perimeter roadway receives comparably little vehicular traffic, is swept at least weekly, and is de-iced with sodium acetate as necessary during winter. These management practices will continue following the construction of the RSA improvements.

The construction of the Taxiway C1 Connector will result in the addition of approximately 1.8 acres of impervious area in an area that is currently grassed infield. Runoff from the Taxiway C1 Connector will sheet flow into the grassed infield between Taxiway C and Runway 33L. Existing catchbasins in the grassed infield collect runoff and discharge through closed drainage systems to Outfalls A-31 and A-32.

Infiltration to groundwater is not a significant interest at Logan Airport, as groundwater elevations across the airfield are tidally controlled, the airport is constructed on reclaimed land, and the resulting soils are unsuitable for recharge. Logan does not contribute to groundwater supplies, nor is it significant to maintaining base flows to streams or waterbodies. Therefore, the proposed stormwater management system does not include infiltration Best Management Practices (BMPs) because infiltration is not occurring under existing conditions and is not feasible at this location because of inadequate separation from seasonal high groundwater and poor-quality fill materials.

All outfalls would 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. Stone rip rap at these outfalls prevents erosion and sedimentation as the result of stormwater discharges.



Pollutant Loading

As described in the Draft EA/EIR, 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 existing and proposed EMAS bed would not be accessed by vehicles other than during an emergency. 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 33L RSA improvements. The majority of the increased impervious surfaces will occur as the result of the construction of the EMAS and deck. Under existing conditions, this 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 will be deposited and temporarily captured by the deck. These pollutants will 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). Prior to 2009, a sand mixture was used for traction control and de-icing on the perimeter roadways. This practice ended after the 2008-2009 winter season and has been replaced with the application of sodium acetate, which does not generate suspended solids or water pollutants. Because sodium acetate dissolves completely once applied, this practice does not generate sediment and reduces the volume of waste material that must be managed by the stormwater treatment and collection system. Snow removal from the existing EMAS bed, if needed, is performed with a snow blower because heavy equipment is prohibited from accessing the EMAS bed. However, Massport staff indicates that, because of strong winds, it is rarely necessary to use snow removal equipment at the perimeter of the airfield. Snow management operations result in negligible impacts to water quality and are performed in accordance with the Airport Stormwater Pollution Prevention Plan (SWPPP) and the NPDES discharge permit.

The sampling data collected under the NPDES permit and previously described in the Draft EA/EIR demonstrate that discharges from the airfield outfalls contain lower concentrations of contaminants than would be expected from a similar combination of grassed and paved surfaces in typical urban areas. The volume and rate of stormwater runoff from the airfield is the same as that from other equivalent cover types. However, stormwater runoff from the airfield contains significantly fewer contaminants than runoff from comparable areas of public roadways handling large volumes of vehicular traffic and treated with standard winter maintenance practices. As described above, sodium acetate is used rather than salt or sand for winter de-icing, and vehicular traffic on the paved perimeter roads is limited to use by safety and maintenance equipment. The perimeter roads are swept frequently (at least weekly) thereby further reducing the quantity of pollutants that could be washed off by stormwater flows.



Environmentally Sensitive and Low Impact Development Techniques

MA DEP requested in its comment letter on the Draft EA/EIR that environmental environmentally sensitive site design and Low Impact Development (LID) techniques be evaluated for the proposed Runway 33L RSA improvements.²⁴ According to guidance from the DEP²⁵, environmentally sensitive site design and LID techniques “minimize impervious surface and land disturbance, source control and pollution prevention, structural BMPs, construction period erosion and sedimentation control, and the long-term operation and maintenance of stormwater management systems.” In accordance with the requirement to minimize impervious surface and land disturbance, the Runway 33L RSA improvements minimize the additional amount of impervious area by removing unnecessary segments of paved roadways and limiting the width of the paved RSA to the minimum approved by the FAA (300 feet). Land disturbance is limited to areas within the project footprint.

At locations where emergency access ramps are required, the RSA improvements have been fit into the terrain and approximate the existing slope of the site from the shoreline down to the edge of the project area at mean low water. A small amount of cut and fill is required to provide the minimum acceptable slope between the top of bank and mean low water. The proposed ramps will have a similar substrate to the existing riprap and pavement that currently exists in this location. These ramps will provide a similar function to the existing Runway 22L ISA and the proposed Runway 22R ISA. The remainder of the Runway 33L RSA improvements will be constructed at the existing grade of the airfield and will be constructed on a pile-supported structure to minimize the amount of land disturbance and harbor fill.

Existing drainage patterns will be maintained, as the RSA does not alter drainage patterns and maintains existing discharge locations. The upland portions of the RSA improvements will slightly increase the peak rate and volume of runoff from the project area. These impacts will be negligible, however, as groundwater elevations in these areas are tidally influenced and the airfield underdrains intercept groundwater and discharge it to the Harbor. Runoff from these areas will be managed by the existing drainage system and will not require the construction of new stormwater outfalls. Runoff from the pier-based portion of the RSA will continue to drain to Boston Harbor, at or near the same rates it does under existing conditions, when rain falling in this area is directly assimilated by the tidal water body.

The concrete and asphalt that are required to construct the remainder of the RSA improvements are stable materials that do not generate TSS or leach other pollutants. Once completed, the RSA will not receive regular vehicular traffic and is not a source of pollutants. The gravel that will be used to construct the emergency access ramps associated with the RSA will be clean and free from debris and other sources of pollution. The Airport complies with its NPDES Stormwater Discharge Permit and maintains a Stormwater Pollution Prevention Plan (SWPPP) which incorporates source control and pollution prevention plan measures. The RSA will be managed in accordance with these plans.

²⁴ Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Department of Environmental Protection, dated September 2, 2010.

²⁵ MA DEP, 2008. Massachusetts Stormwater Handbook, Volume 1, Chapter 1.



4.2.5.2 Indirect Impacts

Indirect impacts of the RSA improvements on water quality potentially include additional turbidity and/or pollutant loading elsewhere in Boston Harbor. The SSFATE (Ssuspended Sediment FATE) model was utilized to predict the water column concentration and deposition of sediment disturbed during pile-driving, auguring, barge deployments and drilling mud overflows. SSFATE addresses the short term movement of sediment that is introduced into the water column and predicts the path and fate of the sediment particles using three-dimensional currents in estuaries and oceans. SSFATE was jointly developed by ASA, Inc. and the U.S. Army Corps of Engineers (USACE) Environmental Research and Development Center (ERDC) to simulate the sediment suspension and deposition from dredging operations.

The RSA would be constructed on a pile- or caisson-supported deck that would not generate pollutants that could be released into the Harbor, nor would it receive significant vehicle traffic or other sources of potential pollutants. Like the existing light pier, limited amounts of erosion would continue to occur as a result of scour at the bottom of the pilings or caissons and currents in the vicinity of the deck would not be significantly altered. The proposed Runway 33L 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 of the runway end. The proposed Runway 33L 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.

4.2.5.3 Temporary Construction Impacts

Potential impacts associated with the construction of the Runway 33L RSA improvements include increased sediment within the water column during installation or removal of sub-surface features, erosion of sediments from disturbed soils within the airfield, and the accidental release of construction materials or construction by-products. Spill prevention measures will be deployed in order to prevent pollution from construction equipment or material. Protective measures, such as silt curtains and silt fencing, will be deployed throughout the construction phase in order to prevent sediment from affecting water quality at the construction site. Construction of the airfield portion of the RSA, perimeter road, and Taxiway C1 Connector improvements will utilize best management practices to prevent erosion of sediment that could impact water quality during the construction period.

As described in Chapter 3, *Affected Environment*, sediment sampling at the Runway 33L end was conducted in December 2007. All of the recovered sediments were visually characterized as silty sand with a low organic content and an average water content of approximately 30 percent (see Table 4.2-7).



Table 4.2-7 Runway 33L Sediment Sampling Physical Results

Sample Number	Laboratory Visual Description	Gradation Analysis (ASTM D422)		Moisture Content (percent)	Organic Content (percent)
		Percent Passing No. 4 (percent)	Percent Passing No. 200 (percent)		
3	Silty sand	100	82	30	2
4	Silty sand	96	39	22	0.8
5	Silty sand	92	80	40	2.6
6	Silty sand	100	31	22	0.6

Source: Childs Engineering. Memorandum on Logan RSA – Sediment Sampling Results. February 1, 2008.

The chemical results were compared to the requirements for upland reuse at Massachusetts-permitted landfills as outlined by the MA DEP. The results were also compared against NOAA’s Sediment Quality Guidelines (SQG) to show the relative quality of the sediments. When compared against NOAA’s SQG, the results show that nothing was over the Effects Range – Medium (ERM) values and the majority of values were below the Effects Range – Low (ERL) values. Therefore, the sediments sampled are relatively clean. As shown in Table 4.2-8, two of the samples showed mercury levels slightly above the ERL but well below the ERM. Samples 5 and 6 also showed values slightly above the ERL for fluorine. However, none of these values would cause water quality impacts. Further all tested parameters were well below the allowable levels indicating that all dredged material should be suitable for reuse in landfills.

Table 4.2-8 Runway 33L Sediment Sampling Chemical Results

Parameter	NOAA SQG		Sample Number			
	Effects Range Low	Effects Range Medium	3	4	5	6
Arsenic (mg/kg)	8.2	70	4.25	1.90	4.45	1.69
Cadmium (mg/kg)	1.2	9.6	1.03	0.50	1.10	0.41
Chromium (mg/kg)	81	370	33.40	9.36	34.20	7.68
Copper (mg/kg)	34	270	26.90	6.76	26.40	6.91
Lead (mg/kg)	46.7	218	16.60	1.84	14.80	1.57
Mercury (mg/kg)	0.15	0.71	0.22	n/a	0.19	n/a
Nickel (mg/kg)	20.9	51.6	10.30	6.33	12.00	5.51
Zinc (mg/kg)	150	410	41.50	13.70	41.00	13.00
Total PCBs (mg/kg)	0.02	0.18	n/a	n/a	n/a	n/a
Total PAHs (mg/kg)	4.02	22.79	0.121	0.033	0.104	0.076
Total VOCs (ug/kg)	--	--	n/a	n/a	n/a	n/a

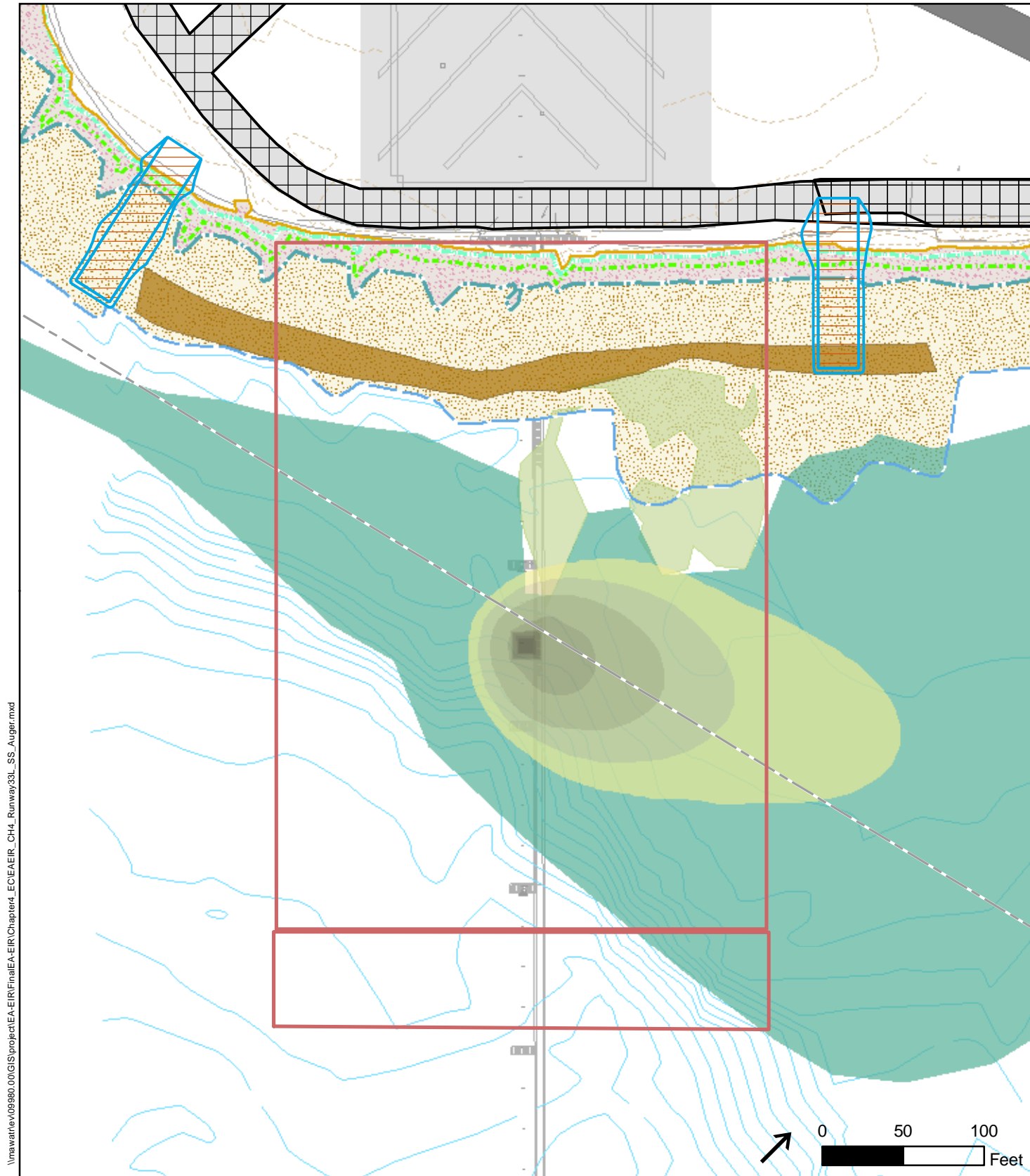
Source: Childs Engineering. Memorandum on Logan RSA – Sediment Sampling Results. February 1, 2008.



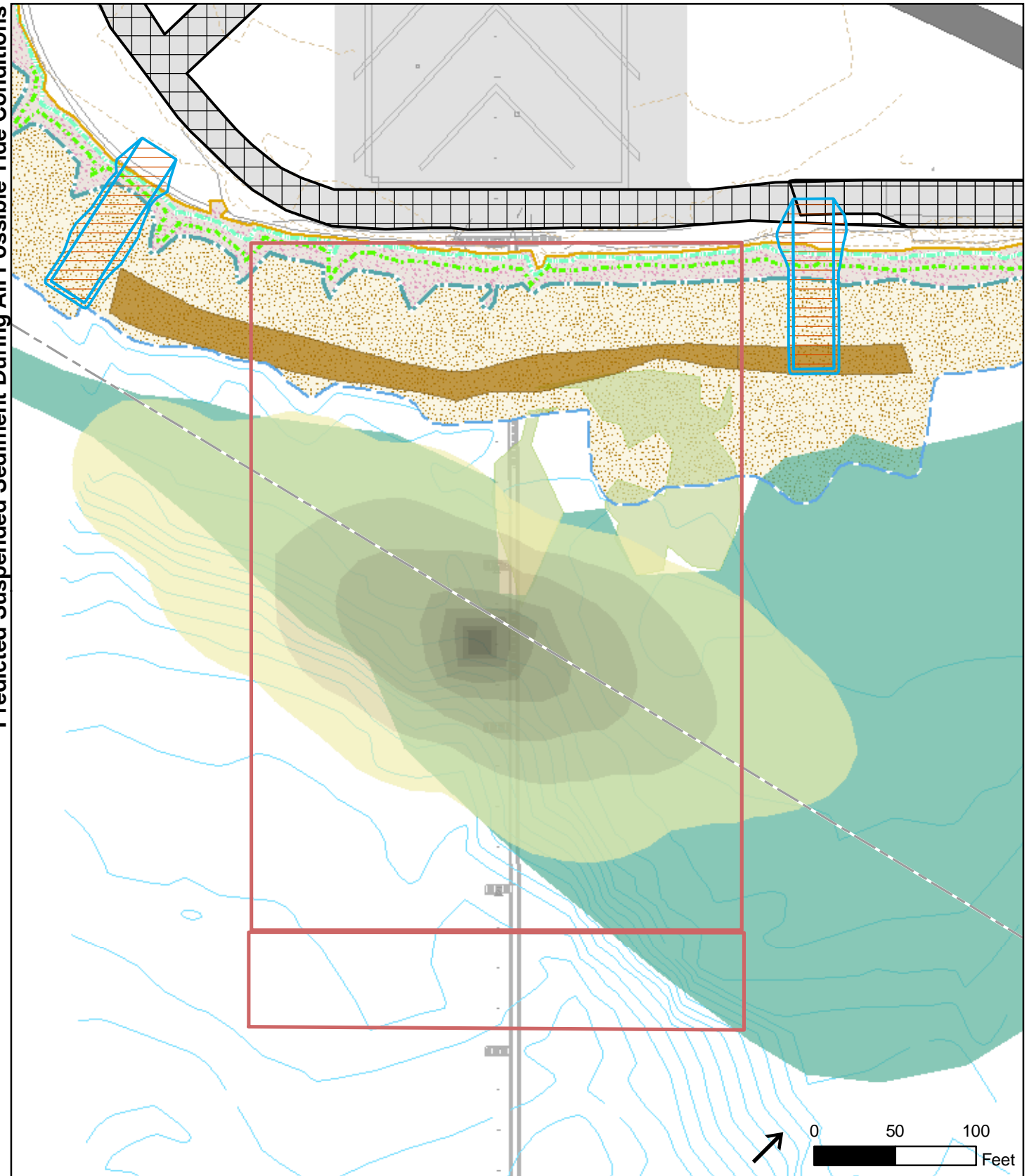
The majority of the proposed Runway 33L RSA improvements would be constructed from barges and other water-based craft. The use of this equipment will limit the amount of disturbance to the areas immediately affected by the insertion of driven piles or installation of caissons. The spuds that barges deploy while operating would release benthic sediments in the water column and increase turbidity in the vicinity of operations (all construction options). Installation and subsequent removal of the temporary piles used to hold templates for pile-driving operations similarly release sediments (Options 1, 2, and 3). Auguring caissons releases a percentage of the excavated sediments and releases a negligible amount of the drilling mud used during the drilling process (Options 5 and 6). Prior to construction of the RSA deck, a portion of the existing light pier must be removed and a temporary lighting system installed. These activities may result in additional sediment disturbance during the removal of the existing timber deck and piles. Analysis of potential environmental impacts related to construction activities was modeled. This analysis determined that sediment resulting from construction activities would result in negligible deposition on the surrounding areas. Harvesting eelgrass by hand for transplanting would not generate sediment.

The suspended sediment concentrations resulting from extracting the temporary piles holding the pile-driving templates in place and from deploying the spud barges were not modeled because the volume of sediment released during a single pile extraction or barge deployment is less than 1 cubic foot and would not result in significant sediment concentrations. Driving pilings (Option 1) would also result in negligible sediment discharges.

The suspended sediment concentrations resulting from auguring the caissons and from the loss of drilling fluid used in the auguring process for construction Options 5 and 6 were calculated using the SSFATE model. It is expected to take 15 minutes to augur a single caisson with a 60-minute period where equipment is repositioned and set up to augur the next caisson. This would result in a continuous release over a 15-minute period of 0.63 yd³ of marine sediment and drilling mud followed by a 60-minute period of no discharge. To simulate this release of sediment and drilling fluid, a single caisson auguring event was modeled for the marine sediment release and one for the drilling fluid release. The results from these simulations are presented as the area covered by a suspended sediment plume of different concentration over different time intervals. As shown in Table 4.2-9 and Figures 4-8 and 4-9 installing caissons for construction Options 2, 3, 5 and 6 would generate a small localized plume for each piling, which would dissipate rapidly. The maximum anticipated suspended sediment concentration (100 mg/L) would occur close to the caisson. The maximum distance that the plume would extend (at a concentration of 5 mg/L) is approximately 650 feet from the caisson.



Predicted Suspended Sediment During a Flood Tide



Predicted Suspended Sediment During All Possible Tide Conditions

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Legend

Footprint of Pile-Supported Deck	Concentration	Highest High Water (7.3')	Raised Mussel Bed
Relocated Perimeter Road	5 mg/L	Mean High Water (5.13')	Cobble Mussel Bed
Emergency Access Ramp	10 mg/L	Mean Low Water (-4.36')	Eelgrass
Demolished Pavement	20 mg/L	Top of Coastal Bank	Coastal Bank
	50 mg/L	Limit of Land Subject to Coastal Storm Flowage	Coastal Beach (Intertidal)
	1,000 mg/L	Airport Property Boundary	



Logan RSA

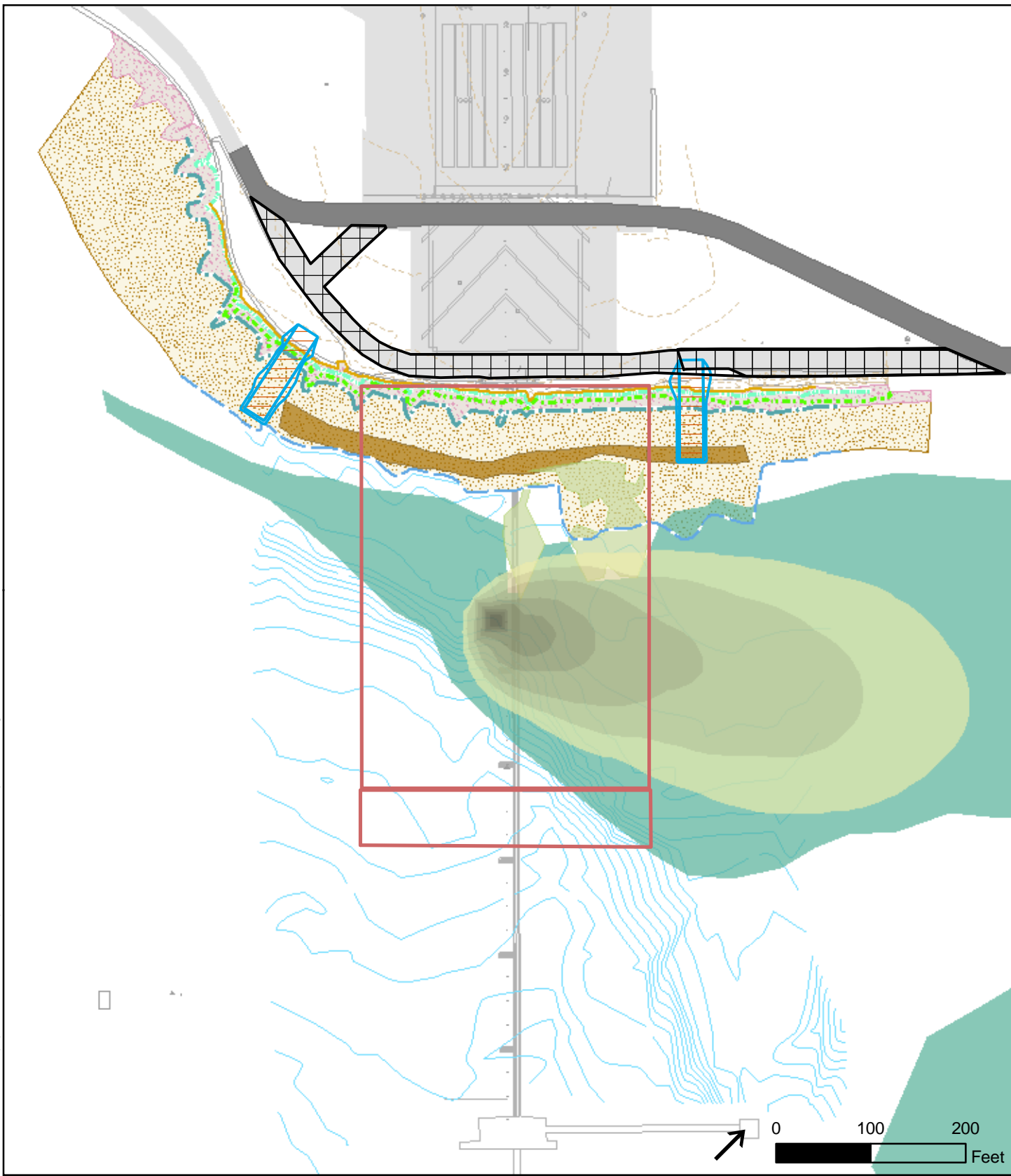
Figure 4-8
Runway 33L RSA
Suspended Sediment Plume Resulting from Auguring a Single Caisson

Source: Applied Science Associates
 Childs Engineering Corp.
 MassGIS Aerial Imagery 2008

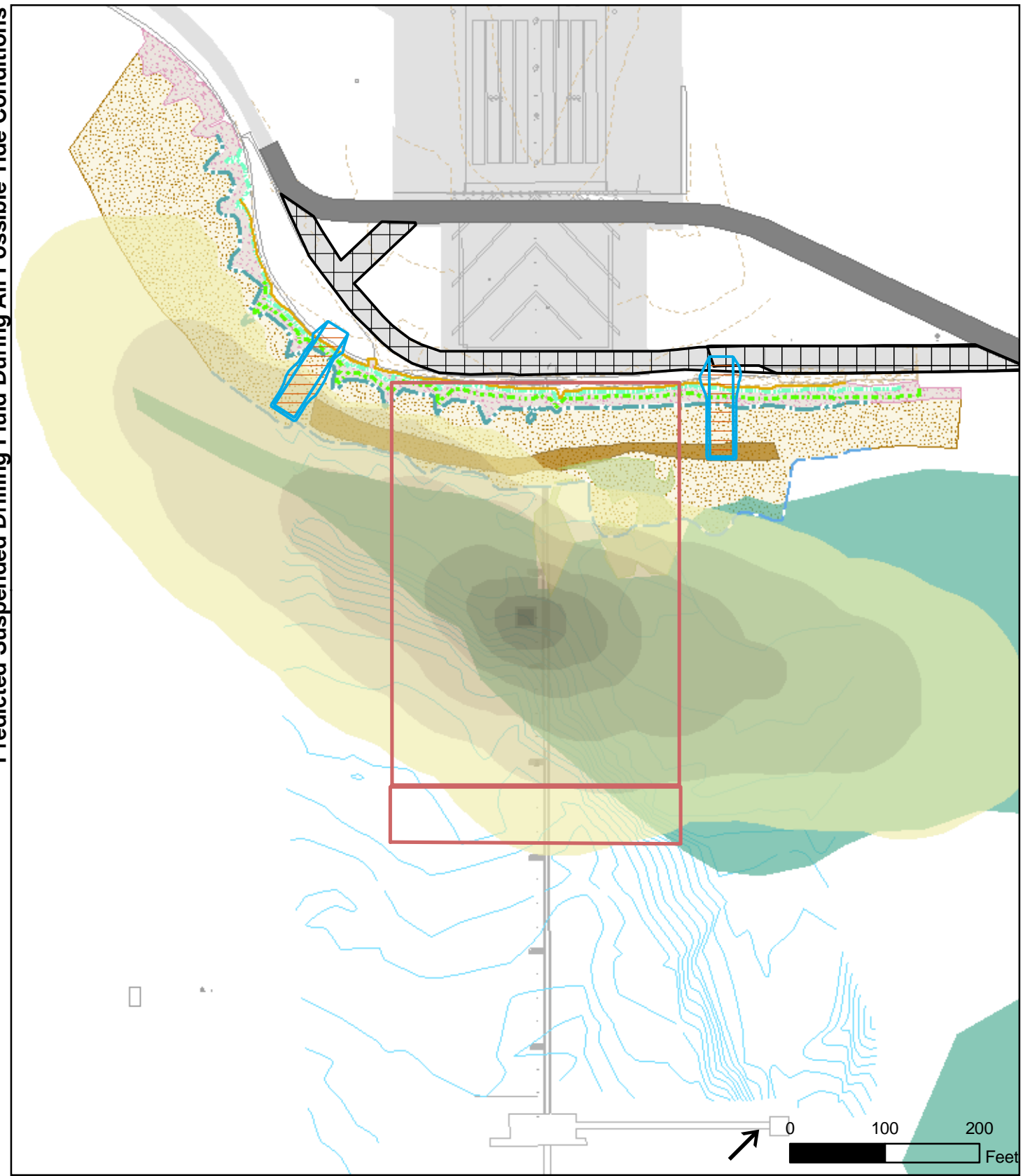


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Predicted Suspended Drilling Fluid During a Flood Tide



Predicted Suspended Drilling Fluid During All Possible Tide Conditions

Legend

Footprint of Pile-Supported Deck	Concentration	Highest High Water (7.3')	Raised Mussel Bed
Relocated Perimeter Road	5 mg/L	Mean High Water (5.13')	Cobble Mussel Bed
Emergency Access Ramp	10 mg/L	Mean Low Water (-4.36')	Eelgrass
Demolished Pavement	20 mg/L	Top of Coastal Bank	Coastal Bank
	50 mg/L	Limit of Land Subject to Coastal Storm Flowage	Coastal Beach (Intertidal)
	100 mg/L	Airport Property Boundary	
	200 mg/L		
	500 mg/L		
	1,000 mg/L		

Logan RSA

Figure 4-9
Runway 33L RSA
Suspended Drilling Fluid Plume Resulting from Auguring a Single Caisson

Source: Applied Science Associates
 Childs Engineering Corp.



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Previous studies indicate that these localized values, are substantially lower than TSS measured in the vicinity of previous Boston Harbor dredging, which ranged from 105 to 455 mg/L, and are comparable to the effects of sediment suspended by ship propellers of deep-draft vessels (40 mg/L).

Table 4.2-9 Runway 33L RSA Predicted Suspended Sediment Plumes

Concentration (mg/L)	Plume Resulting from Caisson Auguring (acres)	Plume Resulting from Drilling Fluid Loss (acres)
5	3.0	6.4
10	0.7	2.5
20	0.3	1.4
50	0.2	0.5
100	0.05	0.17
200	< 0.01	< 0.01

Source: ASA, 2010

The proposed project is anticipated to comply with all state water quality standards for Class SB waters, as described in Chapter 6, *Regulatory Compliance*. These standards (310 CMR 9.07) require that the resuspension of fine particulate matter shall be minimized to protect aquatic life and other existing and designated uses of the waters. For the Boston Harbor Navigation Improvement Project (a joint project of the U.S. Army Corps of Engineers and Massport), the Water Quality Certificate established a performance standard of a maximum concentration of 200 mg/L measured at 500 feet from the activity. As shown in Table 4.2-9 and on Figure 4-8 and Figure 4-9, the anticipated sediment plume from construction of any of the Runway 33L RSA construction options would meet this standard.

4.2.5.4 Findings

FAA *Order 1050.1E* defines a significant impact for water quality as one where an action would not meet water quality standards. Potential difficulty in obtaining a permit or authorization may indicate a significant impact.

As documented in this section and in Chapter 6, *Regulatory Compliance*, the proposed Runway 33L RSA improvements would be designed to meet all relevant state water quality standards and would not have a significant impact on water quality.

4.3 Runway 22R

Constructing the proposed Runway 22R Inclined Safety Area (ISA) could potentially have direct and indirect, short- or long-term impacts to wetland resource areas; Chapter 91 waterways or tidelands; fish, wildlife and plants; federally listed threatened or endangered species; and water quality. The following sections describe the anticipated direct and indirect environmental consequences based on the conceptual design of the ISA.

Construction-related impacts are described for each resource category including resources (such as surface transportation, noise, air quality) that would only be affected temporarily by construction.



A gravel-surfaced ISA is proposed for the Runway 22R end as described in Chapter 2, *Alternatives*, and shown on Figure 2-8 and 2-9. The ISA portion of the safety area would be approximately 130 feet long by 500 feet wide. Similar to the Runway 22L ISA, gabions²⁶ wrapped with filter fabric would be installed around the perimeter of the ISA to improve constructability and minimize gravel and sediment dispersion. Excavation and dredging would remove approximately 6,750 cubic yards of material to the mean lower low elevation²⁷ in order to install the ISA. Approximately 8,700 cubic yards of gravel fill would be placed for a distance of approximately 130 feet north from the existing EMAS bed and would be graded over the full width of the new safety area down to the mean lower low water elevation. Chapter 3, *Affected Environment*, provides a description of the existing conditions at Runway 22R.

The impacts to wetlands are described in Section 4.3.1. Section 4.3.2 is a description of the environmental consequences affecting waterways and tidelands protected under M.G.L. Chapter 91. The impacts to fish, wildlife, and plants and to federally listed threatened and endangered species are described in Section 4.3.3 and Section 4.3.4, respectively. Water quality impacts resulting from the proposed ISA are described in Section 4.3.5.

4.3.1 Wetlands

As described in Chapter 3, *Affected Environment*, of this Final EA/EIR, there are coastal wetlands present within the limits of the proposed Runway 22R RSA improvements. The following section describes the environmental consequences of the proposed ISA. NEPA regulations that address wetlands are discussed in the FAA *Order 5050.4B* and in FAA *Order 1050.1E, Appendix A Section 18.3*. FAA *Order 5050.4B* identifies the significant impact thresholds for wetlands and describes the requirements of the wetlands analysis to determine whether impacts on wetlands are significant.

The Secretary's Certificate requires that the Final EA/EIR include Runway 22R ISA design level plans depicting resource area impacts in greater detail than what was provided in the Draft EA/EIR, as well as include detailed construction and operational specifications. Clarification of the resource area impacts is also required by the Certificate.

4.3.1.1 Direct Impacts

Coastal wetland resources were identified and delineated as described in Section 3.5.1 of Chapter 3, *Affected Environment*. The wetland delineation was overlaid with the footprint of the proposed Runway 22R ISA to quantify the direct impacts to coastal wetlands.

²⁶ A gabion is a rectangular galvanized wire basket filled with stone.

²⁷ Mean Lower Low Water (MLLW) = the average daily lower water level of the tide at a location. Some locations have diurnal tides – one high tide and one low tide per day. At most locations, there are semidiurnal tides – the tide cycles through a high and low twice each day, with one of the two high tides being higher than the other and one of the two low tides being lower than the other.



State-Regulated Wetland Resources

The proposed Runway 22R ISA would result in permanent impacts to Coastal Bank, Salt Marsh, Coastal Beach, Land Under the Ocean, and Land Containing Shellfish. A portion of this area is also defined as Waters of the United States, and is subject to federal jurisdiction. Table 4.3-1 lists the direct impacts to each coastal wetland resource area and Figure 4-10 and Figure 4-11 show the location of these wetland resources.

Buffer Zone

There is a state-regulated buffer zone extending 100 feet landward from the top of Coastal Bank. There would be no permanent impacts to this buffer zone, which contains the perimeter road and a portion of the existing Runway 22R EMAS bed.

Coastal Bank

Approximately 530 linear feet of the natural Coastal Bank would be altered to construct the ISA. Gravel would be placed along the coastal bank where the proposed ISA would be installed. The Coastal Bank at Runway 22R is not significant to storm damage prevention or flood control because it does not supply sediment to coastal beaches, coastal dunes, or barrier beaches. The ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation. The proposed Runway 22R ISA would not affect the interests protected by the MA WPA that are significant to Coastal Bank.

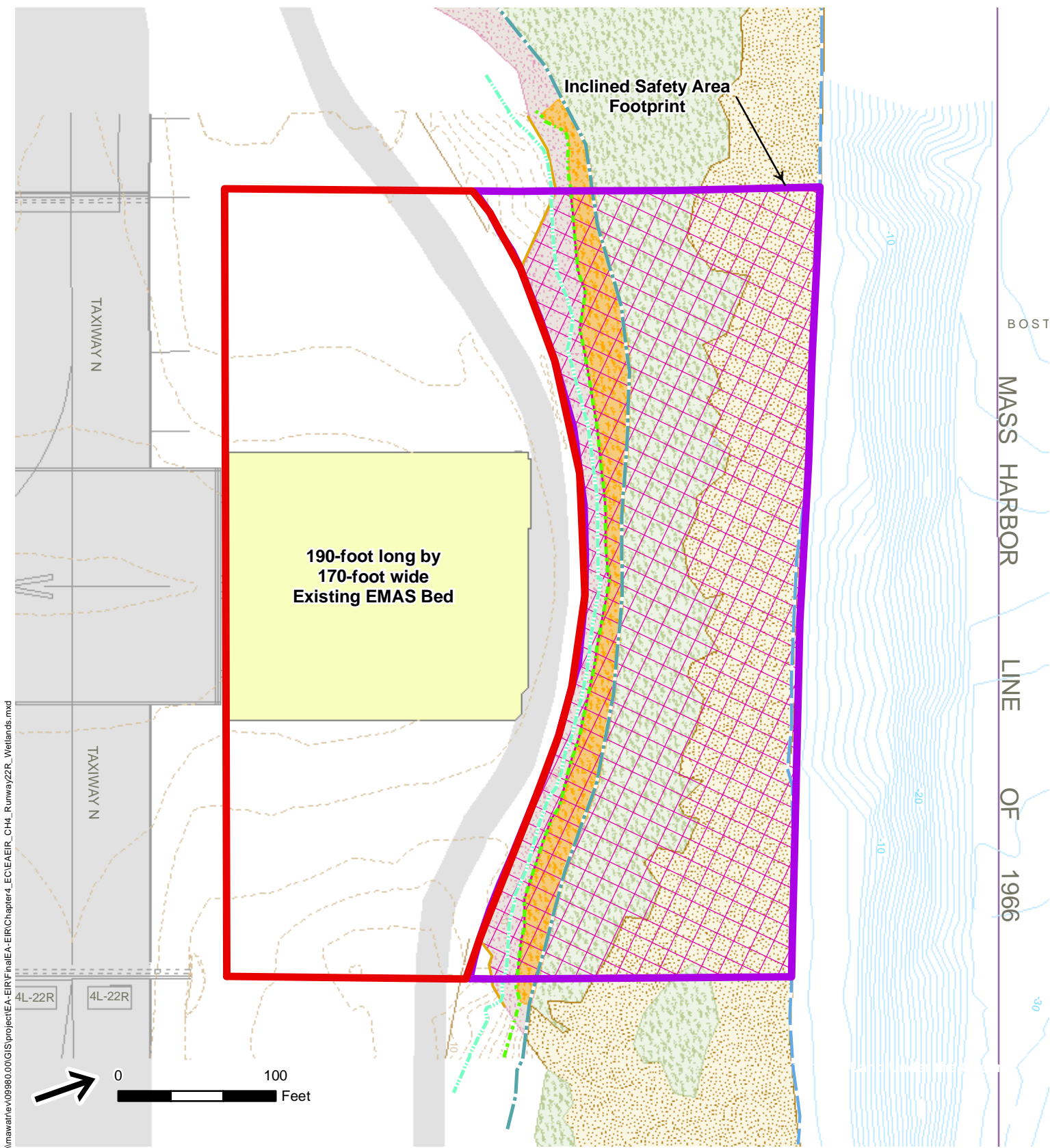
Coastal Beach

The ISA would impact approximately 26,630 square feet of Coastal Beach. The natural Coastal Beach would be replaced by the ISA. The proposed Runway 22R ISA would not affect the interests protected by the MA WPA that are significant to Coastal Beach. It is not likely to impact any adjacent or downdrift Coastal Beach and will not interfere with littoral drift. The ISA would also maintain the stability of the shoreline, which over time, may have reduced stability due to the Runway 22R salt marsh erosion.

Salt Marsh

Approximately 35,040 square feet of Salt Marsh would be impacted by the construction of the ISA. The salt marsh vegetation would be removed within the footprint of the ISA. Salt Marsh is assumed to be significant to the protection of marine fisheries, wildlife habitat, the protection of land containing shellfish where there is shellfish, and the prevention of pollution, and is likely to be significant to storm damage prevention and ground water supply as defined by the MA WPA. The dense vegetation growth of the Salt Marsh is an important factor contributing to the significant interests of the MA WPA: it provides habitat for wildlife and marine species and exports organic matter as the basis of the food web; the vegetation roots assist in the removal of pollutants from surrounding waters by binding sediments together; and the vegetation and underlying peat reduces wave damage by creating a buffer that dissipates wave energy. Removal of Salt Marsh is an unavoidable impact and has been minimized to the extent practicable, as discussed in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

In addition to minimizing the damage to aircraft and enhancing rescue access, construction of the proposed Runway 22R ISA and resulting removal of Salt Marsh and Coastal Bank vegetation has benefits to aircraft safety. *Phragmites* stands are potential roosting for starlings and red-winged blackbirds, and salt marsh is



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Legend

- Existing EMAS Bed
- Existing RSA
- ISA Footprint
- Direct Wetlands Impact
- Coastal Bank
- Coastal Beach (Intertidal)
- Salt Marsh
- Phragmites-dominated Salt Marsh
- Highest High Water (7.3')
- Mean High Water (5.13')
- Mean Low Water (-4.36')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage

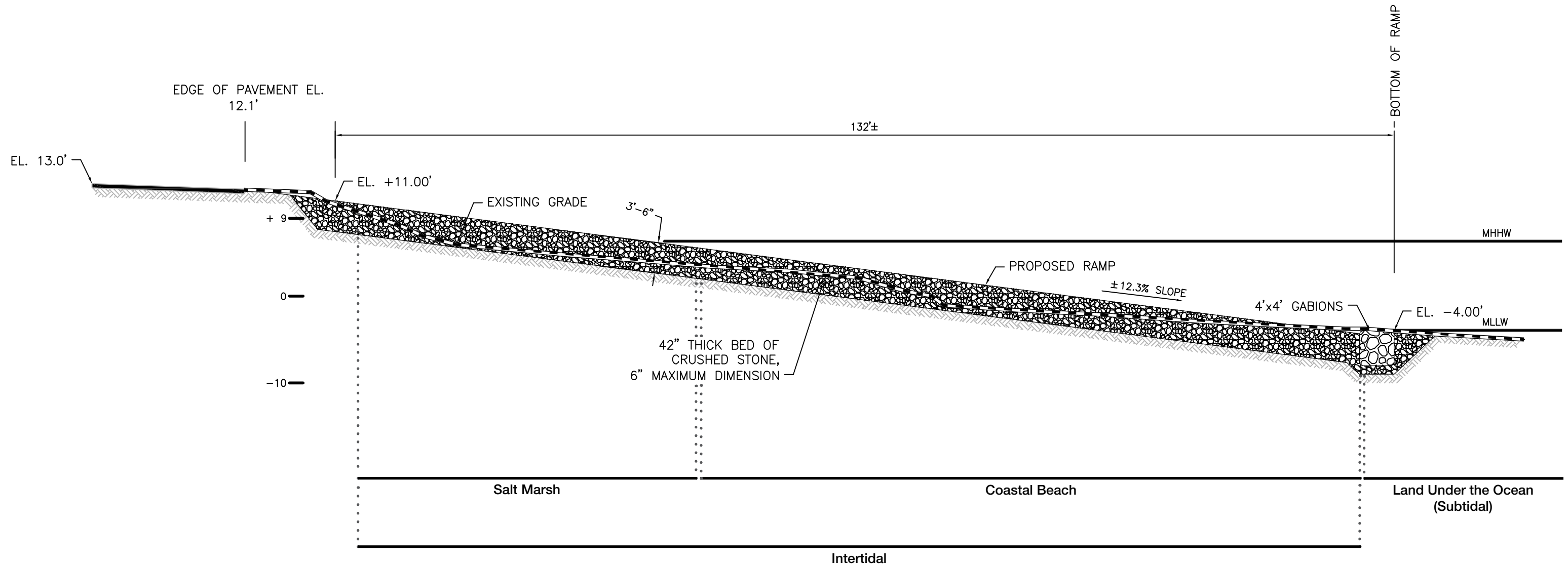


Logan RSA

Figure 4-10

Runway 22R ISA Coastal Wetlands Impacts

Source: Jacobs Edwards & Kelcey, Inc. Childs Engineering Corps. Vanasse Hangen Brustlin, Inc.



Note: State-regulated Land Containing Shellfish overlays Coastal Beach and Land Under Water. It is not a separate geographic area.



Logan RSA

Figure 4-11
Runway 22R Inclined Safety Area
Impact Cross Section



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potential habitat for shorebirds, brant (*Branta bernicla*), and seagulls. The USDA-APHIS Wildlife Services Program has concurred that the existing salt marsh areas at Logan are known to attract wildlife, causing hazards to aircraft operations²⁸. The removal of *Phragmites* on the Coastal Bank and salt marsh vegetation eliminate areas of potential wildlife hazards and is beneficial with respect to the project’s purpose and need.

Land Containing Shellfish

The ISA would impact approximately 62,370 square feet of Land Containing Shellfish. Land Containing Shellfish is assumed to be significant to the protection of marine fisheries as well as shellfish. According to the MA WPA, the following factors are critical to the protection of those interests: shellfish, water quality, water circulation, and the natural bathymetric relief. The proposed Project would not affect water quality and water circulation. The construction of the proposed Runway 22R ISA would alter the natural relief and substrate characteristics and would reduce the area of habitat available to shellfish and benthic macroinvertebrates. The gravel fill would not present a barrier to fish or wildlife movement and would provide an attachment substrate for some shellfish and benthic organisms.

Land Under the Ocean

The ISA would extend to mean lower low water and would impact approximately 700 square feet of Land Under the Ocean. The proposed Runway 22R ISA would not affect the interests protected by the MA WPA that are significant to Land Under the Ocean. The proposed Runway 22R RSA improvements would have no adverse effects on marine fisheries and wildlife habitat protected by Land Under the Ocean, as high densities of polychaetes, mollusks, or macrophytic algae are not present in the vicinity of Runway 22R end. The proposed project will not introduce any pollutants to the marine environment that would affect water quality in the vicinity of Runway 22R.

Table 4.3-1 Runway 22R ISA Direct Wetland Impacts to State-Regulated Wetland Resources

Wetland Resource Area	Direct Impacts (loss)
Buffer Zone	0
Coastal Bank	530 linear feet (altered)
Coastal Beach	26,630 square feet
Salt Marsh	35,040 square feet (7,110 square feet is <i>Phragmites</i> -dominated Salt Marsh)
Land Containing Shellfish ¹	62,370 square feet
Land Under the Ocean	700 square feet

¹ Assumes Coastal Beach, Salt Marsh, and Land Under the Ocean are designated as Land Containing Shellfish. This category adds the impacts from these three resources.

²⁸ Letter from USDA APHIS WS, Monte Chandler, December 14, 2010.



Federally Regulated Section 10 and Section 404 Resources

The following section identifies the federally regulated Section 10 and Section 404 resources within the Runway 22R project area and the anticipated impacts that would result from construction of the proposed Runway 33L RSA. Table 4.3-2 summarizes the impacts to federally regulated resources.

The proposed Runway 22R ISA would result in permanent impacts to waters of the United States within the intertidal and subtidal zones. Table 4.2-3 lists the direct impacts to each coastal wetland resource area. Approximately 6,750 cubic yards of material would be excavated or dredged from Runway 22R end in order to construct the ISA. Approximately 8,700 cubic yards of gravel fill would be placed in the ISA footprint and would be graded to construct the ISA.

The proposed ISA would result in the unavoidable loss of a portion of the existing salt marsh and intertidal mud flat at the Runway 22R RSA. As documented in Table 4.2-3, approximately 35,040 square feet of salt marsh, and 26,630 square feet of intertidal mud flat would be filled to construct the ISA.

Table 4.3-2 Runway 22R ISA Direct Wetland Impacts to Federally-Regulated Resources

Wetland Resource Area	Direct Impacts (loss)	Excavation and Dredging (cubic yards)	Fill (cubic yards)
Salt Marsh	35,040 square feet (7,110 square feet is <i>Phragmites</i> -dominated Salt Marsh)		
Additional Intertidal	26,630 square feet		
Subtidal	700 square feet		
Total	62,370 square feet	6,750 cy	8,700 cy

Federal Resource Functions and Values

Functions and values of coastal wetlands at the Runway 22R end, regulated under CWA Section 404 would be affected by the proposed ISA. The following is a description of how applicable functions and values of coastal wetlands under federal jurisdiction would be affected.

- **Fish and Shellfish Habitat:** Fish and shellfish habitat in the salt marsh and tidal flats adjacent to Runway 22R, outside of the ISA, would still be available after construction of the proposed ISA. Gravel fill would be placed to the mean lower low water line and dredging and excavation would alter intertidal fish habitat at Runway 22R end. Shellfish habitat would also be altered by replacing the natural substrate with gravel fill. The proposed ISA would alter the bathymetric elevation and the distribution of the sediment grain size.
- **Production Export:** Production export would be affected by the proposed Runway 22R ISA. Currently, this area provides food (algae and benthic macroinvertebrates) for wildlife, including birds, and marine organisms. The existing Salt Marsh and Coastal Beach/Tidal Flat provides habitat for food sources, and the



alteration of these areas would reduce the function of the overall wetland, which extends from Runway 22L into Wood Island Bay. The ISA would provide habitat interspersed in the gravel, although at a more limited scale than the existing conditions.

- **Sediment/Shoreline Stabilization:** The proposed Runway 22R ISA would not adversely affect the stability of the shoreline. The proposed improvements would maintain or improve stability of the shoreline.
- **Wildlife Habitat:** Wildlife habitat at the Runway 22R end would be altered as salt marsh and bank vegetation that provides habitat for a variety of wildlife species would be removed and replaced with gravel fill. The proposed ISA would not be a barrier to movement for wildlife along the shoreline. Eliminating wildlife habitat at the runway end is a benefit with regard to the project safety purpose.

4.3.1.2 Indirect Impacts

The effect of the proposed Runway 22R ISA on coastal processes was analyzed to determine if there would be any change to the current velocity and sediment erosion potential in the area, an indirect impact. The analysis showed that, based on the spring tide velocity at Runway 22R of 0.31 knots (16 centimeters per second) and the proposed footprint of the ISA, the velocity would increase to 0.32 knots.²⁹ This increase would not be significant and would not change the sediment erosion potential at Runway 22R. The ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation. It is not expected to cause scour or erosion to salt marsh adjacent to the project area due to currents. These findings are consistent with Massport's observations since 1994 at the existing Runway 22L ISA.

Indirect impacts of the proposed Runway 22R ISA on coastal wetlands potentially include erosion or sedimentation of coastal wetlands or habitat outside of the RSA footprint. Indirect impacts to tide current velocities at the Runway 22R end were determined based on changes in existing spring tide current that would result from the proposed ISA. The measurements of currents were completed in the field during a spring tide. Sediment dispersion was also modeled at Runway 22R to determine where marine sediment introduced into the water column during construction would potentially be deposited outside of the proposed ISA footprint. The sediment dispersion model SSFATE³⁰ was used to simulate dispersion and deposition of sediment from construction activities based on currents.

The proposed Runway 22R ISA would not cause erosion or sedimentation of coastal wetlands because the ISA is not predicted to change wave direction or velocity or to result in increased erosion or deposition because of its orientation. As has been the experience with the existing Runway 22L ISA, proposed safety improvements at Runway 22R are not expected to cause scour or erosion to salt marsh adjacent to the construction area due to currents. The proposed Runway 22R ISA would not cause any indirect impacts to coastal wetlands, including loss of functions and values outside of the ISA footprint, as discussed below.

²⁹ Applied Science Associates. *Results from Data Collection, Hydrodynamic Modeling and Environmental Effects Analysis for Boston-Logan International Airport Runway Improvements*. March 11, 2010.

³⁰ SSFATE (Suspended Sediment FATE) was jointly developed by Applied Science Associates and the USACE Environmental Research and Development Center (ERDC) to simulate the sediment suspension and deposition from dredging operations. Its use has extended to include the simulation of cable and pipeline burial operations using water jet trenchers, and mechanical plows, and to simulating the suspended sediment from anchor cable sweeps on the seafloor.



- The proposed Runway 22R ISA would not affect the ability of any wetlands outside of the RSA footprint to recharge or discharge groundwater. At this coastal location, wetlands outside of the RSA footprint are unlikely to recharge or discharge groundwater.
- The proposed Runway 22R ISA would not affect floodflow alteration functions or the ability to reduce flood damage of wetlands outside of the ISA footprint. The ISA would not affect floodplains as there are none at the Project area.
- The proposed Runway 22R ISA does not represent a barrier to movement and would not reduce or fragment any wetland habitat functions or values outside of the ISA footprint. The ISA would not decrease the ability of other wetlands to provide wildlife, shellfish, or fish habitat.
- The gravel fill will be contained within the footprint of the proposed Runway 22R ISA by the gabions wrapped with filter fabric installed at the perimeter and the stabilized rock surface. These features will minimize any sediment dispersion that may affect wetland functions and values outside of the ISA footprint after the ISA is fully constructed. The ISA would not increase sediment, toxics, or pathogens.
- The proposed Runway 22R ISA would not reduce the ability of wetlands outside of the footprint to remove, retain, or transform nutrients. The ISA would not change runoff patterns.
- The production export function of wetlands outside of the proposed Runway 22R ISA footprint would not be affected. The ISA would not cause any change to wildlife use, fish and shellfish habitat, vegetation, flushing, or other characteristics of production export.
- The shoreline stabilization function of wetlands outside of the proposed Runway 22R ISA footprint would not be affected. The ISA would provide additional stability to the shoreline.

4.3.1.3 Temporary Construction Impacts

There would be no short-term construction-related impacts to coastal wetland resources other than the dispersal of sediment. Construction staging would take place outside of coastal wetlands within adjacent uplands. Some construction equipment may be located within the 100-foot buffer to Coastal Bank. Excavation and dredging to remove unsuitable substrate materials could temporarily impact water quality. These activities could result in a temporary increase in suspended sediments in the immediate vicinity of the proposed work. As discussed in Section 4.3.5, *Water Quality*, the tides will quickly disperse any sediment; therefore, this short-term impact would be negligible. All construction would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts as discussed in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

Excavation and dredging to remove unsuitable substrate materials may also result in a temporary increase in suspended sediments causing turbidity in the immediate vicinity of the proposed work. Appropriate controls to reduce or avoid disturbance to fish and shellfish habitat will be utilized, such as silt curtains that would reduce turbidity outside of the construction area. The gabions wrapped with filter fabric installed during the initial construction would also act as a barrier to any sediment releases and resulting turbidity increases.



The area potentially covered by the sediment deposit represents a worse-case scenario over the course of the entire construction period that assumes that none of the proposed mitigation, such as silt curtains, is in place to protect the adjacent waters from sedimentation. Based on the conservative sediment dispersion modeling, a sediment deposit less than 0.1 millimeters (0.04 inches) thick would cover approximately 1.2 acres of Coastal Beach and Land Under the Ocean, as shown on Figure 4-12 (Table 4.3-3). The impact represents the worst-case scenario of sediment dispersion without sedimentation controls, such as silt curtains. Sediment deposition of less than 0.1 mm is negligible and would not have significant adverse effects on benthic organisms that may be found in that area.

Table 4.3-3 Runway 22R ISA Sediment Deposition

Wetland Resource Area	Direct Impact (Sediment) ¹
Buffer Zone	0
Coastal Bank	0
Coastal Beach	40 square feet
Salt Marsh	0
Land Containing Shellfish ²	52,750 square feet
Land Under the Ocean	52,710 square feet

¹ Sediment deposition approximately 0.1 mm thick

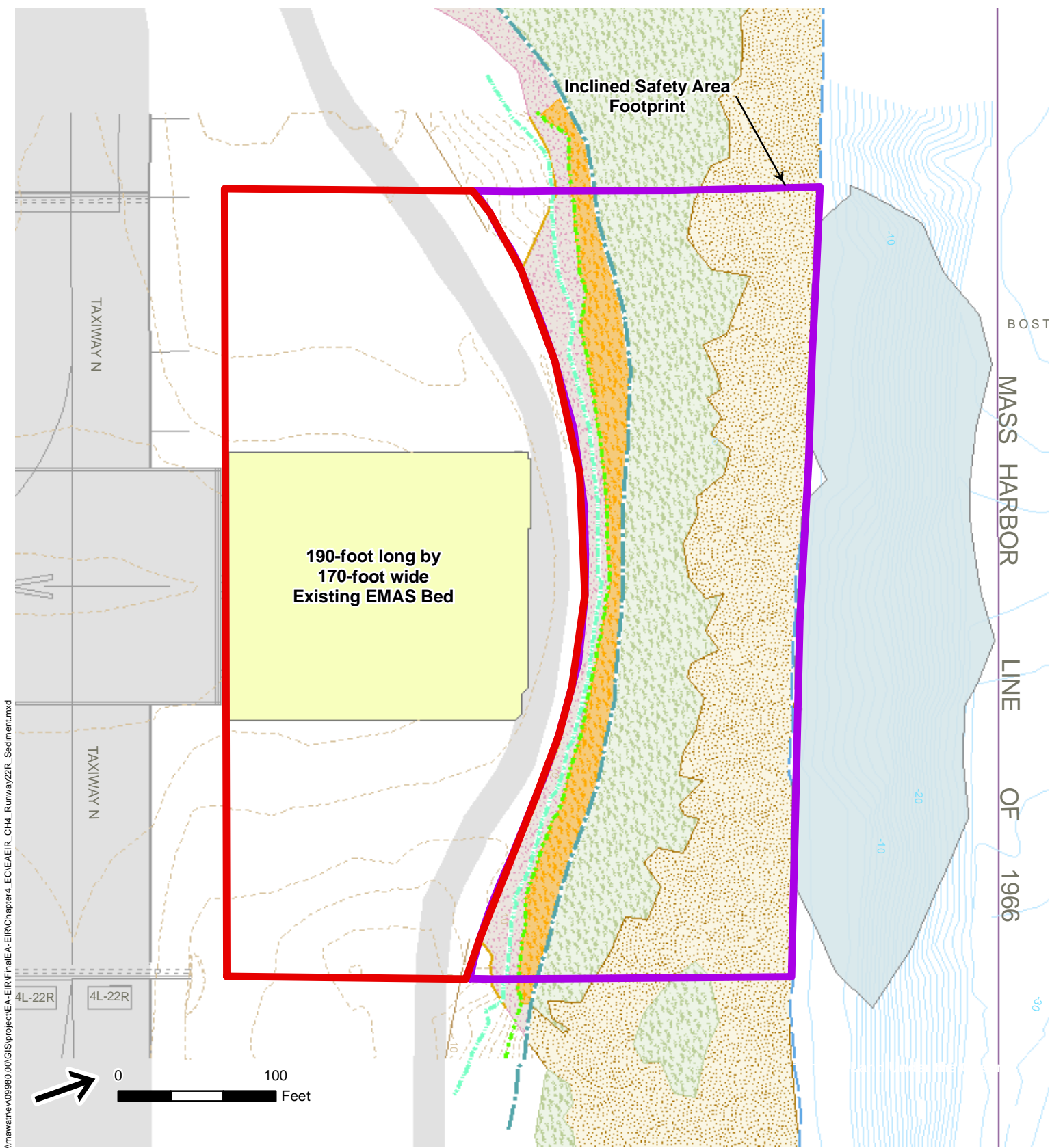
² Assumes Coastal Beach, Salt Marsh, and Land Under the Ocean are designated as Land Containing Shellfish. This category adds the impacts from these three resources.

Construction would not impact coastal processes, such as waves, currents, or other hydrodynamics, as all excavation and dredging would take place from the land, and there would be no structures or equipment in the water.

4.3.1.4 Findings

In accordance with the FAA *Order 1050.1E*, an action would result in a significant impact to wetlands if it:

- Adversely affects a wetland’s functions to protect the quality or quantity of a municipal water supply, including sole source and potable water aquifers.
- Substantially alters hydrology needed to sustain affected wetland values and functions or those of a wetland to which it is connected.
- Substantially reduces the affected wetland’s ability to retain floodwater or storm runoff, thereby threatening public health, safety, or welfare.



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- Legend**
- Existing EMAS Bed
 - Existing RSA
 - ISA Footprint
 - Sediment Dispersion**
 - 0.1 mm
 - Highest High Water (7.3')
 - Mean High Water (5.13')
 - Mean Low Water (-4.36')
 - Top of Coastal Bank
 - Limit of Land Subject to Coastal Storm Flowage



LOGAN AIRPORT RSA
Runway Safety Area Improvements Project

- Coastal Bank
- Coastal Beach (Intertidal)
- Salt Marsh
- Phragmites-dominated Salt Marsh

Logan RSA

Figure 4-12

Runway 22R ISA Sediment Deposition

Source: Jacobs Edwards & Kelcey, Inc.
 Childs Engineering Corps.
 Vanasse Hangen Brustlin, Inc.



- Adversely affects the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources in the affected or surrounding wetlands.
- Promotes development of secondary activities or services that causes any of the above impacts.
- Is inconsistent with applicable state wetland strategies.

As documented in this section, the proposed Runway 22R ISA would not affect water supplies, alter hydrology, affect the ability of the coastal wetlands to protect the public health, safety or welfare, and would not adversely affect the maintenance of natural systems. The Runway 22R ISA would not encroach on a floodplain or affect any floodplain values, since this is a tidal environment.

With the proposed mitigation for the loss of salt marsh and shellfish resources, the proposed Runway 22R RSA improvements would not result in a significant impact as defined at FAA *Order 1050.1E*. With mitigation, the proposed Runway 22R RSA improvements would meet the criteria for a Variance under the MA WPA and comply with the Commonwealth's No Net Loss Policy and would therefore be consistent with state wetland strategies.

4.3.2 Waterways and Tidelands

The proposed Runway 22R ISA was analyzed to determine potential effects on coastal waterways and tidelands. The majority of the proposed Runway 22R ISA is located seaward of the mean high water line on areas subject to Chapter 91 and the Massachusetts Coastal Zone Management Program. FAA *Order 5050.4B* and FAA *Order 1050.1E Appendix A, Section 3.3*, indicate there is no significant impact threshold identified for coastal resources. The analysis of significant impacts focuses on how a proposed project is or is not consistent with a state's coastal zone management program (see Chapter 6, *Regulatory Compliance*).

The Secretary's Certificate did not require any additional information on impacts to coastal waterways and tidelands. Discussions of how the Project meets the standards for a Chapter 91 Variance and a Public Benefits Determination are included in Chapter 6, *Regulatory Compliance*. Mitigation is discussed in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

4.3.2.1 Direct Impacts

Direct impacts are the result of placing fill within the waterways and tidelands subject to Chapter 91 jurisdiction, and include the loss of the resource. The Runway 22R ISA would have permanent impacts to waterways and tidelands as described below. An area of approximately 1.43 acres below the mean high water line would be affected due to the construction of the ISA.

Chapter 91 does not apply to any of the previously filled tidelands within the geographical boundary of Logan Airport [310 CMR 9.03(3)]; therefore this evaluation only looks at the areas that are subject to jurisdiction below the high tide line. The waters adjacent to Logan Airport, extending 500 feet seaward of the mean high water line, are designated as the Logan Airport Security Zone under M.G.L. Chapter 90 Section 61. As described in the Draft EA/EIR, all activities (including boating, fishing, hunting, shellfishing, and swimming) are prohibited or



greatly curtailed within this zone except by special permit. Boats may travel within the outer 250 feet of this area, within navigable waters, without a special permit.

The only interests within this area are limited shellfishing, living marine resources, and water quality. No public access is provided in the Project area due to Airport security requirements, except for badged shellfishers. The construction of the ISA would alter an area that supports shellfish as described in Section 4.3.3.

4.3.2.2 Indirect Impacts

Impacts were assessed based on the footprint of the filled area on Chapter 91 tidelands, in the context of the public uses adjacent to Logan Airport. No indirect impacts to waterways or tidelands are anticipated. The proposed Runway 22R ISA would not affect the public's rights on tidelands elsewhere in Boston Harbor because the proposed Project does not require closing tidelands elsewhere in Boston Harbor.

4.3.2.3 Temporary Construction Impacts

There are no temporary construction-related impacts to tidelands and waterways or coastal processes resulting from the Runway 22R ISA construction. No public access is allowed on tidelands within the Logan Airport Security Zone without prior Massport approval. Use of tidelands and waterways outside of the security zone would not be affected during construction.

4.3.2.4 Findings

Chapter 91 Waterways and Tidelands are a state-regulated resources with no comparable federal regulation. There are no FAA NEPA criteria for significant impacts. As documented in this section, the proposed Runway 22R ISA would not affect the public's interests in tidelands. The MA DEP found that there are no alternatives that allow the project to be in compliance with 310 CMR 9.00, the project minimizes the interference with public interests and proposes mitigation to compensate for any remaining detriments, and the project is necessary to accommodate an overriding regional, state and/or federal interest.³¹

4.3.3 Fish, Wildlife and Plants

This section includes a discussion of the environmental consequences of the proposed safety improvements on fish, wildlife, and plants. NEPA regulations that address fish, wildlife, and plants are discussed in FAA *Order 5050.4B* and in FAA *Order 1050.1E*. FAA *Order 1050.1E Appendix A, Section 8.3*, identifies the significant impact thresholds related to fish, wildlife, and plants. There is no significant impact as the proposed Project would not affect any non-listed threatened or endangered species according to FAA *Order 1050.1E*.

³¹ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Department of Environmental Protection, dated September 2, 2010.



The Secretary's Certificate requires the Final EA/EIR to provide a discussion of expected impacts to shellfishing and mitigation for those impacts. Potential shellfish mitigation measures are identified in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

4.3.3.1 Direct Impacts

Section 3.5.2 of Chapter 3, *Affected Environment*, describes the existing fish, wildlife, and plants found in the Runway 22R Study Area. Direct impacts would be the loss of these resources within the footprint of the proposed Runway 22R ISA. There would be permanent changes to fish habitat, wildlife, and plants as a result of the proposed Runway 22R ISA. The construction of the proposed ISA requires placing gravel fill within the RSA to create a gradual slope from the existing runway end to mean low water. The amount of habitat loss for fish and wildlife is minor. The fish, shellfish, and wildlife species that are common to the habitat at the Runway 22R end could utilize similar habitat on Logan Airport property and elsewhere in Boston Harbor.

Fish and Benthic Organisms

A small amount of intertidal habitat that could be used by fish species (approximately 1.4 acres, including salt marsh and coastal beach), including the 18 species for which Boston Harbor is designated as EFH, would be altered. The proposed ISA extends to mean lower low water elevation. This will permanently alter 700 square feet of subtidal habitat at Runway 22R, but this area provides low habitat value and there is abundant EFH for each of the fish species in the adjacent waters and elsewhere in Boston Harbor. These changes are not anticipated to have permanent or significant impacts to fish or EFH at the Runway 22R end due to the minor loss of salt marsh and intertidal habitat. NMFS concurs that all practicable alternatives to avoid and minimize impacts to the aquatic environment have been considered for Runway 22R.³² Although NMFS finds that all practicable alternatives to avoid and minimize impacts have been considered, the agency also finds that there is an adverse impact to EFH due to filling intertidal mud flat at this location.³³ The mitigation plan for salt marsh and intertidal mudflats, resources used for spawning, foraging, and shelter, is described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

The proposed Runway 22R ISA would replace a portion of the Coastal Beach/Tidal Flat present at Runway 22R end with a crushed stone substrate. This would eliminate habitat for certain benthic organisms such as soft-shelled clams, razor clam, sand shrimp, mud snails, green crab, and polychaetes. However, the gravel fill could provide attachment substrate for some of these or other benthic organisms. The proposed ISA would not be a barrier to movement along the shoreline. The amount of habitat lost due to construction of the proposed ISA is minor, and there is available habitat elsewhere on Logan Airport property and throughout Boston Harbor.

³² Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated September 2, 2010.

³³ *ibid.*



Shellfish

This section describes the resource and the habitat rather than the regulated area under the MA WPA, which is described in Section 4.3.1. As described in Chapter 3, *Affected Environment*, and Section 4.3.2.2, the population of harvestable soft shell clams is of low density and therefore the resulting impacts to shellfish harvesting would not be significant. At a December 14, 2010 meeting at Logan Airport with the shellfishers who are badged and authorized to dig clams in the conditionally restricted flats adjacent to Logan Airport, it was reported that the Runway 22R flat as a very productive clam flat. The meeting attendees indicated that they felt the loss of 0.7 acres of the Runway 22R clam flat due to the construction of the ISA would concentrate the shellfishers into a smaller area, affecting their catch and impacting their income. They also stated their belief that the loss of this clam flat could also have a long-term impact as the Runway 22R is a source of seed clams.

Massport is developing options for shellfish mitigation in coordination with the DMF. Shellfish mitigation is anticipated to be similar to the mitigation performed by Massport for Runway 22L, and would include constructing new flats in conjunction with the salt marsh mitigation, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

Wildlife (Birds and Mammals)

There are no anticipated permanent impacts to wildlife (birds and mammals) as a result of the conversion and loss of a small segment of coastal bank and of salt marsh. Although common wildlife species would be displaced, wildlife can use similar habitat on Logan Airport property or elsewhere in Boston Harbor. The loss of wildlife habitat at this location is a safety benefit, as the existing *Phragmites* stand is considered a wildlife hazard. There would be no permanent impacts to the upland sandpiper (*Bartramia longicauda*), the Massachusetts-listed endangered species known to occur within the grassy interior of the airfield. There is no work proposed within mapped upland sandpiper habitat. The NHESP indicated that the proposed Project would not adversely affect the actual resource area habitat for the state-protected species.³⁴

Plants

The proposed Runway 22R ISA would require the removal of vegetation. The salt marsh grasses (*Spartina alterniflora* and *S. patens*) and common glasswort (*Salicornia europaea*) within the project site at the end of Runway 22R would be replaced with gravel fill. A stand of *Phragmites* at the Runway 22R end would also be removed. The vegetation does not provide important wildlife value, although starlings and red-winged blackbirds have been observed in this area. These tall grasses represent a potential wildlife hazard to aircraft utilizing Runway 4L-22R as they attract avian species which could interfere with aircraft operations. *Phragmites* is a non-native invasive species that will displace native species if not controlled or removed, and the removal would benefit the native vegetation adjacent to the proposed ISA. There are no unique plant communities at the Runway 22R end.

³⁴ Letter received from the Massachusetts Natural Heritage and Endangered Species Program dated March 26, 2010.



4.3.3.2 Indirect Impacts

Indirect impacts of the proposed Runway 22R ISA on fish, wildlife, and plants potentially include changes to the population sizes, persistence, or diversity of fish, wildlife, or plants within Boston Harbor. Indirect impacts are the potential effects of the proposed Runway 22R ISA on the movement of wildlife, population effects due to changes in food sources, and other potential changes that would affect fish or wildlife populations in the vicinity of Logan Airport. There would be no indirect impacts to fish population sizes, persistence, or diversity as the proposed ISA would not change water quality, salinity, or temperature. There would be no change to the vegetation community that provides habitat for wildlife indirectly affecting wildlife population sizes, persistence, or diversity. There would be no change to air quality, temperature, sunlight, or water quality that may indirectly affect plant population size, persistence, or diversity.

4.3.3.3 Temporary Construction Impacts

Temporary construction impacts may include noise, turbidity, and disruption of terrestrial and aquatic plants and wildlife. Temporary construction impacts to water quality may occur during the placement of the gravel fill and dredging. Increased sedimentation could affect the respiration and reproduction of benthic organisms, and could cause damage to the gills, scales, and eggs of fish. However, the estimated amount of sediment deposition (less than 0.1 mm) would occur over a small area and would have a negligible effect on benthic organisms.

The DMF and NMFS have recommended a time of year restriction for in-water, silt-producing work extending from February 15th through June 30th for the protection of winter flounder, one of the fish species for which Boston Harbor is designated as EFH, using nearshore areas for spawning, larval settlement, and juvenile development.^{35,36} The recommended time of year restrictions will avoid impacts to fish development and designated EFH. Massport will not conduct any in-water, silt-producing construction during the recommended time of year restriction.

Controls for water pollution and soil erosion, such as using a siltation curtain and a debris boom to contain and minimize any siltation or debris, would be implemented during construction to minimize impacts. An approved Soil Erosion and Sediment Control Plan would be implemented during construction and is described further in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

4.3.3.4 Findings

While there is no specific significance threshold established for non-listed species, FAA *Order 1050.1E* requires that the FAA consider the project's effects on non-listed species population dynamics, sustainability, reproduction rates, natural and artificial mortality (aircraft strikes), and the minimum population size needed to maintain the affected population.

³⁵ Comment Letter on the ENF received from the Massachusetts Division of Marine Fisheries, dated August 7, 2009.

³⁶ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated September 2, 2010.



The analysis in this section shows that the proposed Runway 22R RSA improvements would not significantly affect fish, wildlife, or plants because the alternatives would not reduce the habitat size below the level sufficient to sustain species commonly found in the affected area or adversely impact sensitive habitat supporting plant or animal species not commonly occurring in the affected area.

4.3.4 Federally Listed Threatened and Endangered Species

This section summarizes environmental consequences of the proposed RSA improvements to federally listed threatened or endangered species protected under the ESA that may occur in the vicinity of the proposed Runway 22R ISA. The Draft EA/EIR provided a detailed analysis of impacts to federally listed threatened or endangered species. NEPA regulations that address threatened and endangered species are discussed in the FAA *Order 5050.4B* and in FAA *Order 1050.1E*. FAA *Order 1050.1E Appendix A, Section 8.3*, identifies the significant impact thresholds related to federally listed threatened or endangered species.

The U.S. Fish and Wildlife Service (USFWS) indicated that there are no federally listed threatened or endangered species under their jurisdiction within the Project area.³⁷ NMFS has indicated that sea turtles, protected under the ESA, may occur within Boston Harbor and requested that the FAA undertake an ESA Section 7 Consultation.³⁸ Prior to the filing of the Draft EA/EIR, the FAA made a preliminary determination that the proposed pile-supported deck is not likely to adversely affect any threatened or endangered species listed under the jurisdiction of NMFS.^{39, 40} NMFS concurred with the FAA's determination, and indicated that the ESA Section 7 Consultation is complete.⁴¹ Although the Secretary's Certificate on the Draft EA/EIR required further discussion of the impacts to sea turtle habitat, NMFS has determined that additional analysis is not required.

FAA *Order 1050.1E* defines a significant impact for endangered species as one when the USFWS or NMFS determines a proposed action would likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat. As documented in this section and attached correspondence, the FAA has determined, and NMFS has concurred, that the proposed Runway 33L RSA improvements would have an effect, but not an adverse effect, on the habitat of sea turtles. These safety improvements would not have a significant effect on endangered species.

4.3.5 Water Quality

Evaluating water quality is a necessary component of the NEPA review as required by the FAA NEPA regulations. NEPA regulations that address water quality are discussed in the FAA *Airport Environmental Handbook (Order 5050.4B)* and in the FAA *Environmental Impacts: Policies and Procedures (Order 1050.1E)*. FAA *Order 1050.1E Appendix A, Section 17.3*, identifies the significant impact thresholds related to water quality.

37 Letter received from the United States Fish and Wildlife Service, New England Field Office, dated December 19, 2007.

38 Letter received from the National Marine Fisheries Service, dated March 24, 2010.

39 Letter to National Marine Fisheries Service from the Federal Aviation Administration, dated March 22, 2010.

40 Vanasse Hangen Brustlin, Inc. Assessment of Sea Turtles and Whale Presence within the Boston Harbor Technical Memorandum, dated February 12, 2010.

41 Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated July 26, 2010.



The Secretary's Certificate required that the Final EA/EIR evaluate the ISA design, potential impacts to water quality, and the proposed Runway 22R ISA's compliance with the Massachusetts Stormwater Standards. Specifically, the Certificate requires the Final EA/EIR to:

- Evaluate the Environmentally Sensitive Site Design, including Low Impact Development measures; and
- Evaluate the potential impacts to water quality from material excavation for the ISA construction and refine the dredged material disposal plan if necessary.

A discussion of the proposed Runway 22R ISA's regulatory compliance with water quality regulations, including the Massachusetts Stormwater Management regulations, and the applicable Stormwater Policy Standards is provided in Chapter 6, *Regulatory Compliance*. Mitigation measures to protect water quality during construction and post-construction are presented in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

4.3.5.1 Direct Impacts

The following sections include a discussion of the environmental consequences of the proposed safety improvements on water quality. Potential impacts were evaluated by comparing the existing stormwater management system and its impacts on water quality with the stormwater management features of the proposed Runway 22R ISA. Potential impacts to water quality are closely linked to changes in the composition, volume, and rate of stormwater runoff for projects that do not involve new water withdrawals or point-source discharges. Evaluation of water quality impacts typically considers increases in stormwater runoff, decreases in infiltration, and changes in the concentrations of constituents contained within the runoff. Impervious surfaces such as runways, perimeter roadways, and safety areas were evaluated to determine the hydraulic and hydrologic characteristics under existing conditions. Because all runoff from Logan Airport discharges to tidal waterbodies, peak rate control is not a water quality consideration as long as stormwater outfalls are designed to manage discharges without causing erosion. Changes to infiltration and recharge are not water quality considerations because subsurface conditions at the Airport are not conducive to infiltration and groundwater levels are tidally influenced.

The proposed Runway 22R ISA would have no permanent impacts to water quality. No vehicles would operate on the proposed ISA, no new impervious surfaces and no new stormwater conveyance systems would be created and the proposed ISA would not result in any new discharge of untreated stormwater. There would be no change to the quality and quantity of stormwater runoff resulting because the proposed ISA is not an area with higher pollutant loading and would not generate permanent changes in total suspended solids (TSS). No construction or changes in paved areas will occur landward of Coastal Bank. The proposed project would be in compliance with the Massachusetts Stormwater Management regulations and the existing NPDES permit as explained in Chapter 6, *Regulatory Compliance*.

Drainage patterns in the project area will not be altered by the construction of the ISA, approximately 90 percent of which (69,000 square feet) is seaward of highest high water. There would be no increase of freshwater inputs to Boston Harbor. Rainfall landing in this area is assumed to be assimilated directly by the tidal water body without creating runoff or accumulating additional pollutants. Because the ISA is a compacted gravel bed



consisting of materials with high infiltration rates, negligible amounts of runoff would be expected to occur, even during rainfall events that coincide with low tide. For example, if a storm event were to occur when the entire surface of the ISA was exposed during an extreme low tide and a void space 20 percent was conservatively assumed for the compacted gravel bed, up to 8.4 inches of rainfall could be stored within the gravel bed before runoff occurred, 1.7 inches more than the 24-hour, 100 year storm event for the Boston area. Any rainfall stored in the gravel would be gradually dispersed during the next tidal cycle.

Other than first responders attending to an airplane accident, the ISA will not receive any vehicular traffic. No TSS or other pollutants would be generated or captured by the ISA other than through normal atmospheric deposition.

The gradual slope and surface of the proposed Runway 22R ISA would prevent scouring by stormwater runoff. Runoff would flow down the slope of the proposed ISA to mean lower low water and would not erode the existing mud flat, as demonstrated by the adjacent ISA for Runway 22L.

The DEP requested in its comment letter on the Draft EA/EIR that environmentally sensitive site design and Low Impact Development (LID) techniques be evaluated for the proposed Runway 33L RSA improvements.⁴² According to guidance from the MA DEP⁴³, environmentally sensitive site design and LID techniques “minimize impervious surface and land disturbance, source control and pollution prevention, structural BMPs, construction period erosion and sedimentation control, and the long-term operation and maintenance of stormwater management systems.” In accordance with the requirement to minimize impervious surface and land disturbance, the Runway 22R ISA does not add any impervious areas and limits land disturbance to areas within the project footprint. The safety improvements have been fit into the terrain and approximate the existing slope of the site from the shoreline down to the edge of the project area at mean low water. Existing drainage patterns will be maintained, as the ISA does not alter drainage patterns in the surrounding areas and does not include structural stormwater management. The ISA will closely approximate pre-development hydrologic conditions, as portions of the gravel bed that are not submerged during the tidal cycle will temporarily store and infiltrate stormwater runoff before discharging it farther down slope into the Harbor.

The gravel and crushed stone that will be used to construct the ISA will be clean and free from debris and other sources of pollution. Once completed, the ISA will not receive regular vehicular traffic and is not a source of pollutants. Construction period measures will be deployed to minimize siltation in the surrounding waters and will be described in the NPDES Construction General Permit Notice of Intent and Stormwater Pollution Prevention Plan.

⁴² Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Department of Environmental Protection, dated September 2, 2010.

⁴³ MA DEP, 2008. Massachusetts Stormwater Handbook, Volume 1, Chapter 1.



4.3.5.2 Indirect Impacts

The analysis of indirect and temporary effects to water quality also evaluated the potential effects of sedimentation caused by changes in tidal currents, as well as the effects of sediment discharged during excavation or placing fill to construct the proposed ISA. The ISA would not increase pollutant loading in Boston Harbor because it is not a source of new pollutant loading as described in Section 4.3.1.2. The proposed Runway 22R ISA 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.

4.3.5.3 Temporary Construction Impacts

Water quality in the vicinity of the proposed Runway 22R ISA could be temporarily affected by short-term construction activities, particularly due to the excavation and dredging required to remove unsuitable substrate materials and to place new stone fill. These activities may result in a temporary increase in suspended sediments and increased turbidity in the immediate vicinity of the proposed work. Any turbidity created would be quickly dispersed by the tides; therefore, the effects from temporary construction-related turbidity are negligible. Any construction completed at the Runway 22R end would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts. The gabions wrapped with filter fabric installed during the first stage of construction would also act as a construction-phase and permanent barrier to any sediment releases and resulting turbidity. Chapter 5, *Proposed Mitigation and Section 61 Findings*, describe the Soil Erosion and Sediment Control Plan, including the construction sequence that will be followed to minimize impacts.

In order to reduce the potential for any impact to water quality during dredging or excavation, the soils to be excavated and placed would both be pre-characterized through soil sampling. Massport has identified three licensed disposal facilities where the materials can be taken based on the pre-characterization. Material would be dredged or excavated from the shoreline and placed directly in trucks that would take the materials to one of the disposal facilities. There would be no storage of materials at the project site. If the pre-characterization shows that additional preventative measures need to be taken to minimize any potential for a pollution release during construction or excavation or for pollutants reentering the water column, those measures will be in accordance with the NPDES permit process under the CWA, RCRA, OSHA regulations, and the MCP. Only clean fill would be approved for placement.

As described in Chapter 3, *Affected Environment*, sediment sampling at the Runway 22R end was conducted in December 2007. All of the recovered sediments were visually characterized as silty sand with a low organic content and an average water content of approximately 30 percent (see Table 4.3-4).



Table 4.3-4 Runway 22R Sediment Sampling Physical Results

Sample Number	Laboratory Visual Description	Gradation Analysis (ASTM D422)		Moisture Content (percent)	Organic Content (percent)
		Percent Passing No. 4 (percent)	Percent Passing No. 200 (percent)		
1	Silty sand	99	63	30	3.2
2	Silty sand	95	54	35	5.7

Source: Childs Engineering. Memorandum on Logan RSA – Sediment Sampling Results. February 1, 2008.

The chemical results were compared to the requirements for upland reuse at Massachusetts-permitted landfills as outlined by the MA DEP. The results were also compared against NOAA’s Sediment Quality Guidelines (SQG) to show the relative quality of the sediments. When compared against NOAA’s SQG, the results show that nothing was over the Effects Range – Medium (ERM) values and the majority of values were below the Effects Range – Low (ERL) values. Therefore, the sediments sampled are relatively clean. As shown in Table 4.3-5, none of the samples are above the ERL values and therefore, there would be no indirect impacts to water quality impacts. Further all tested parameters were well below the allowable levels indicating that all dredged material should be suitable for reuse in landfills.

Table 4.3-5 Runway 22R Sediment Sampling Chemical Results

Parameter	NOAA SQG		Sample Number	
	Effects Range Low	Effects Range Medium	1	2
Arsenic (mg/kg)	8.2	70	4.79	3.08
Cadmium (mg/kg)	1.2	9.6	0.71	0.64
Chromium (mg/kg)	81	370	13.40	13.30
Copper (mg/kg)	34	270	9.42	10.30
Lead (mg/kg)	46.7	218	2.56	2.79
Mercury (mg/kg)	0.15	0.71	n/a	n/a
Nickel (mg/kg)	20.9	51.6	7.98	8.57
Zinc (mg/kg)	150	410	18.40	20.60
Total PCBs (mg/kg)	0.02	0.18	n/a	n/a
Total PAHs (mg/kg)	4.02	22.79	0.028	0.076
Total VOCs (µg/kg)	--	--	n/a	n/a

Source: Childs Engineering. Memorandum on Logan RSA – Sediment Sampling Results. February 1, 2008.



4.3.5.4 Findings

FAA *Order 1050.1E* defines a significant impact for water quality as one where an action would not meet water quality standards. Potential difficulty in obtaining a permit or authorization may indicate a significant impact.

As documented in this section and in Chapter 6, *Regulatory Compliance*, the proposed Runway 22R RSA improvements would be designed to meet all relevant state water quality standards and, therefore, would not have a significant impact on water quality.

4.4 Cumulative Impacts

The NEPA definition of a cumulative impact comes from the Council on Environmental Quality (CEQ), which defines a cumulative impact as:

“... impact on the environment that 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 actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.”⁴⁴

The Draft EA/EIR considered the potential for the proposed RSA improvements, in combination with other recent or anticipated projects, to adversely affect the natural or social environment. The analysis was developed following guidance issued by the CEQ. FAA *Order 1050.1E (paragraph 500c)* notes that “if the proposed action causes the cumulative impacts of these non-project actions to exceed an applicable significant threshold, then the proposed action would be the one causing the significant impact.”

FAA *Order 1050.1E* does not directly address the analysis and evaluation of cumulative impacts. FAA’s *Environmental Desk Reference for Airports Actions* notes that cumulative impacts should be compared against the applicable significance threshold for the resource analyzed, and that the responsible FAA official should determine if project impacts added to those of the past, present, and reasonably foreseeable future actions trigger the significance threshold for the resource analyzed.

The Secretary’s Certificate required additional clarification on the wetland area impact. In addition to clarifying the wetland impacts for each runway end in Section 4.2.1 and Section 4.3.1, the cumulative impact for coastal wetlands is provided below for both state-regulated wetland resources and federally regulated Section 404 and Section 10 resources.

⁴⁴ 40 CFR § 1508.7



Table 4.4-1 Cumulative Direct and Indirect Impacts to Wetland Resources (Loss or Impairment due to Project)

Resource Area	Runway 33L RSA ¹	Runway 22R ISA	Total
State-Regulated Wetland Resources			
Coastal Bank	355 linear feet (altered)	530 linear feet (altered)	885 linear feet (altered)
Coastal Beach	4,570 square feet	26,630 square feet	31,200 square feet
Salt Marsh	0	35,040 square feet ⁵	35,040 square feet
Land Under the Ocean	1,045 square feet	700 square feet	1,745 square feet
TOTALS (intertidal and subtidal)	5,495 square feet	62,370 square feet	67,865 square feet
Land Containing Shellfish ²	1,175 square feet	62,370 square feet	63,545 square feet
Eelgrass (Submerged Aquatic Vegetation) ³	66,600 square feet ⁴	0	66,600 square feet
Federally Regulated Section 404 and Section 10 Resources			
Intertidal	4,570 square feet	26,630 square feet	31,200 square feet
Salt Marsh	0	35,040 square feet ⁵	35,040 square feet
Subtidal	1,045 square feet	700 square feet	1,745 square feet
TOTALS (intertidal and subtidal)	5,495 square feet	62,370 square feet	67,865 square feet
	708.9 cubic yards	8,700 cubic yards	9,409 cubic yards
Eelgrass(Submerged Aquatic Vegetation) ³	66,600 square feet	0	66,600 square feet

- 1 Maximum impact considering 5 construction options
- 2 Land Containing Shellfish overlays Coastal Beach and Land under the Ocean and is not a separate geographic area
- 3 Eelgrass (SAV) overlays Land Under the Ocean and is not a separate geographic area. The impacts are the same for both the state jurisdiction and the federal jurisdiction.
- 4 Impact includes direct and indirect shading from deck.
- 5 Approximately 7,110 square feet is *Phragmites*-dominated Salt Marsh.

As documented in the Draft EA/EIR, the proposed Logan Airport RSA Improvements Project (including both the Runway 33L RSA improvements and the Runway 22R ISA) would not result in significant impacts to environmental resources when considered in combination with past, present, and reasonably foreseeable future actions.

4.5 Summary

The following sections provide a summary of the impacts associated with each of the proposed RSA Improvement Projects.

4.5.1 Runway 33L

The proposed RSA improvements would have direct impacts to coastal wetlands, waterways and tidelands, and fish, wildlife, and plants, as a result of constructing a new pile-supported deck. The RSA would not



permanently affect coastal processes, such as waves, currents, or other hydrodynamics but would result in the loss of habitat, such as eelgrass, which supports shellfish and other wildlife.

There are potentially significant impacts to wetlands as the proposed RSA cannot be constructed in compliance with the Massachusetts Wetlands Protection Act Regulations and would require a Variance. With the proposed mitigation measures, impacts would be fully mitigated and would be in compliance with the Variance criteria. Unavoidable impacts to Waters of the United States would be mitigated in accordance with the Corps of Engineers’ regulatory requirements under Section 404 of the Clean Water Act. Unavoidable impacts to eelgrass would be mitigated to comply with the Massachusetts Coastal Zone Management Plan’s Habitat Policy 1. Mitigation measures for these impacts are proposed in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

As documented in the Draft EA/EIR, construction would result in minor increases to truck traffic, noise, and emissions of air quality pollutants. However, these increases would not adversely affect the roadway system or local traffic conditions, would not exceed applicable noise impact criteria, and would constitute a *de minimis* impact and in compliance with the Clean Air Act General Conformity regulations.

Table 4.5-1 Runway 33L RSA Significant Impacts

Impact Category	Significant Adverse Effect (yes/no)
Noise	No. There is no change to airport operations or to the runway.
Surface Transportation	No. The proposed project does not affect the roadway network or increase traffic.
Air Quality	No. There is no change to airport operations or to the runway.
Historical, Architectural, Archaeological, and Cultural	No. There are no historic or archaeological resources within the project area.
Wetlands and Waterways	No (with mitigation). Mitigation would be provided consistent with state and federal requirements.
Water Quality	No. The proposed project is in compliance with water quality standards.
Fish, Wildlife, and Plants	No. No adverse impact to state-listed threatened or endangered species or other fish, wildlife, and plant species has been identified.
Federally Listed Threatened or Endangered Species	No. There is no adverse impact to federally listed threatened or endangered species under USFWS jurisdiction. Consultation with NMFS has been completed. The proposed project would not adversely affect any threatened or endangered species.
Floodplains	No. There are no floodplains present at the project site.
Coastal Resources	No (with mitigation). Mitigation will be provided to achieve consistency with the Massachusetts Coastal Zone Management Plan Habitat Policy 1.
Hazardous Materials and Solid Waste	No. The proposed project does not involve a project on or eligible for the National Priority List.
Light Emissions and Visual Impact	No. There are no new light emissions at the project area (although the approach light system will be upgraded). There are no visual impacts to the existing environment.
Construction Impacts	No (with mitigation). Construction would not result in significant traffic, noise, air quality, or water quality impacts.

4.5.2 Runway 22R

The proposed Runway 22R ISA would have direct impacts to coastal wetlands, waterways and tidelands, and fish, wildlife, and plants, as a result of placing fill along the shoreline to create the ISA. The ISA would not permanently affect coastal processes, such as waves, currents, or other hydrodynamics but would result in the



loss of habitat, such as salt marsh, which supports shellfish and other wildlife. However, the impacts to fish and wildlife habitat are not significant and there is abundant similar habitat outside the ISA footprint, elsewhere on Airport property, and elsewhere in Boston Harbor.

There are potentially significant impacts to wetlands according to FAA *Order 1050.1E* as described in Table 4.5-2, as the proposed ISA cannot be constructed in compliance with the Wetlands Protection Act Regulations and would require a Variance. With the proposed mitigation measures, impacts would be fully mitigated and would be in compliance with the Variance criteria. Unavoidable impacts to Waters of the United States would be mitigated in accordance with the Corps of Engineers’ regulatory requirements under Section 404 of the Clean Water Act. Unavoidable impacts to salt marsh would be mitigated to achieve consistency with the Massachusetts Coastal Zone Management Plan Habitat Policy 1 (see Chapter 5, *Proposed Mitigation and Section 61 Findings*).

As documented in the Draft EA/EIR, construction would result in minor increases to truck traffic, noise, and emissions of air quality pollutants, and would generate suspended sediment. However, these increases would not adversely affect the roadway system or local traffic conditions, would not exceed applicable noise impact criteria, and would constitute a *de minimis* impact and in compliance with the CAA General Conformity regulations. Discharges of sediment would be mitigated through silt curtains, booms, and other methods.

Table 4.5-2 Runway 22R ISA Significant Impacts

Impact Category	Significant Adverse Effect (yes/no)
Noise	No. There is no change to airport operations or to the runway.
Surface Transportation	No. The proposed project does not affect the roadway network or increase traffic.
Air Quality	No. There is no change to airport operations or to the runway.
Historical, Architectural, Archaeological, and Cultural	No. There are no historic or archaeological resources within the project area.
Wetlands and Waterways	No (with mitigation). Mitigation would be provided consistent with state and federal requirements.
Water Quality	No. The proposed project is in compliance with water quality standards.
Fish, Wildlife, and Plants	No. No adverse impact to state-listed threatened or endangered species or other fish, wildlife, and plant species has been identified.
Federally Listed Threatened or Endangered Species	No. There is no adverse impact to federally listed threatened or endangered species under USFWS jurisdiction. Consultation with NMFS is ongoing. The proposed project is not likely to adversely affect any threatened or endangered species.
Floodplains	No. There are no floodplains present at the project site.
Coastal Resources	No (with mitigation). Mitigation will be provided to achieve consistency with the Massachusetts Coastal Zone Management Plan Habitat Policy 1.
Hazardous Materials and Solid Waste	No. The proposed project does not involve a project on or eligible for the National Priority List.
Light Emissions and Visual Impact	No. There are no light emissions at the project area. There are no visual impacts to the existing environment.
Construction Impacts	No (with mitigation). Construction would not result in significant traffic, noise, air quality, or water quality impacts.



5

Proposed Mitigation and Section 61 Findings

5.1 Introduction

According to the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA) (40 CFR 1500.2(f)), project proponents shall, to the fullest extent possible:

“Use all practicable means consistent with the requirements of the Act and other essential considerations of nation policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions on the quality of the human environment.”¹

In accordance with the NEPA regulations, this chapter identifies and evaluates measures that would avoid impacts. Measures to minimize impacts by limiting the degree or magnitude of the proposed RSA Improvements Project and its implementation are also included. As documented in this chapter, impacts to environmental resources are unavoidable due to the location of the existing RSAs; therefore measures that minimize adverse impacts have been 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 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 Secretary’s Certificate on the DEIR for the RSA Improvements Project included requirements for the scope of the Final EA/EIR. The Certificate required that the Final EA/EIR include a mitigation chapter that:

¹ Council on Environmental Quality, Regulations for Implementing the National Environmental Policy Act (40 CFR 1500), http://ceq.hss.doe.gov/nepa/regs/ceq/toc_ceq.htm.



- Includes proposed Massachusetts General Law (M.G.L.) Chapter 30, Section 61² findings for all state permits with a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation and the identification of the parties responsible for implementing the mitigation; and
- Includes a schedule for the implementation of mitigation that will identify deadlines by which mitigation measures will be completed.

This chapter provides a description of Massport's proposed commitments to mitigation during construction, for compensatory mitigation for impacts to salt marsh, eelgrass, and 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.

5.2 Project Mitigation Commitments

As described throughout this Final EA/EIR, from project inception, Massport and FAA have strived to meet the critical aviation safety need of the project, appropriately balancing the direct and indirect natural resources impacts of the safety improvements, and seek innovative and effective mitigation strategies. This has been an ongoing iterative process that will continue to identify and incorporate additional avoidance and minimization strategies through final design, construction and operation. Impacts to natural resources are unavoidable for any of the safety area improvement alternatives that meet the project purpose, as demonstrated in Chapter 2, *Alternatives*, of this Final EA/EIR. For both Runway 22R and Runway 33L, the evaluation of alternatives has focused on options that minimize these unavoidable impacts to coastal wetlands and waters to the extent practicable.

This section describes the proposed mitigation for unavoidable impacts to salt marsh (Section 5.2.1), eelgrass (Section 5.2.2), Land Containing Shellfish (Section 5.2.3.), and water quality (Section 5.2.4), as requested by the Certificate and consistent with NEPA requirements. For each resource, the analysis describes efforts to avoid impacts, minimize impacts, and provide compensatory mitigation.

5.2.1 Salt Marsh

The proposed safety improvements would affect salt marsh at the Runway 22R end. Approximately 35,040 square feet of salt marsh (including 7,110 square feet of *Phragmites*-dominated Salt Marsh) would be lost. There is no salt marsh in the Runway 33L RSA improvements project area. Based on input from the federal and state resource agencies participating in the Salt Marsh Mitigation Working Group, a 2:1 mitigation goal would be required by Massachusetts Department of Environmental Protection (MA DEP)³ and U.S. Army Corps of

2 Massachusetts General Law, Chapter 30, Section 61: *Determination of Impact by Agencies; Damages to Environment; Prevention or Minimization; Foreseeable Climate Change Impacts*. <http://www.mass.gov/legis/laws/mgl/30-61.htm>.

3 Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Wetlands and Waterways Program: Massachusetts Inland Wetland Replication Guidelines, March 2002.



Engineers (USACE),⁴ for mitigation of salt marsh and associated mudflat (26,630 square feet), totaling approximately 123,340 square feet (2.83 acres).

The MEPA Certificate included a number of specific requirements for wetland (salt marsh) mitigation to be addressed in the Final EA/EIR. These requirements include:

- Provide a detailed wetlands replication plan that, at a minimum, includes: replication location(s) delineated on plans, elevations, typical cross sections, test pits or soil boring logs, the hydrology of areas to be altered and replicated, list of wetlands plant species of areas to be altered and the proposed wetland replication species, planned construction sequence, and a discussion of the required performance standards and monitoring;
- Include monitoring plans for and the management of any invasive species that may begin to grow in the replication area;
- Develop mitigation and monitoring plans by working closely with local, state and federal environmental agencies;
- Include a detailed analysis of the on-site mitigation options as requested in the City of Boston's comment letter and address the possibility of off-site mitigation if on-site mitigation is infeasible;
- Makes every effort to ensure that coastal wetland resource restoration and mitigation are conducted in Boston Harbor;
- Assess existing, degraded areas of salt marsh, eelgrass and shellfish beds for purposes of rehabilitation and review recently restored areas such as the salt marsh in Chelsea Creek off of Condor Street in East Boston;
- Design the scope and extent of mitigation and restoration efforts to result in a net benefit to affected coastal resource areas in the Harbor;
- Discuss proposals to conduct restoration and mitigation outside of the affected resource in the context of clear facts demonstrating that they cannot be accomplished in the Harbor or other nearby areas in Boston;
- Establish a reporting procedure to assess the health of existing and restored resource areas; and
- Provide contingencies to ensure that if restoration efforts fail, additional measures will be required to compensate for the loss of the resource area functions and values.

As described in other chapters, Massport established an interagency Working Group composed of local, state and federal resource agency representatives to guide development of the Runway 22R RSA salt marsh mitigation strategy. This process has resulted in the identification of a preferred salt marsh mitigation site which would restore salt marsh in the Rumney Marsh Area of Critical Environmental Concern. Detailed wetlands replication plans are provided in this Final EA/EIR. These plans address the requirements stated in DEP's letter dated June 22, 2010 (see Appendix 4, *Agency Correspondence*), which provided a detailed list of information

⁴ U.S. Army Corps of Engineers, Addendum to New England District Compensatory Mitigation Guidance: Compensation for Impacted Aquatic Resource Functions, File No. NAE-2006-3648, December 18, 2007.



required in the final salt marsh mitigation plan. The mitigation plan also addresses the requirements of the Corps of Engineers under Section 404 of the Clean Water Act.

The following sections include a discussion on avoidance and minimization measures and a description of the compensatory mitigation goals, site selection, and a conceptual salt marsh restoration plan. It also includes a summary of the mitigation costs and the next steps to be taken in the salt marsh mitigation process.

5.2.1.1 Avoidance

As noted above, Massport and FAA undertook an extensive alternatives analysis to select a recommended Runway 22R safety project to be analyzed initially in the ENF and Chapter 2, *Alternatives*, in the Draft EA/EIR. Because of the proximity of the salt marsh to the existing runway end, the only Runway 22R safety alternative that would avoid wetland impacts without further reducing safety at Logan Airport is the No-Action Alternative. The No-Action/ No-Build Alternative does, not, however, meet the project's purpose of enhancing safety.

The EMAS bed installed by Massport at the end of Runway 22R in 2005 provides the minimum level of safety consistent with FAA standards. The Runway 22R EMAS bed does not, however, provide the maximum level of safety for the aircraft fleet mix that utilizes Runway 4L-22R. The existing EMAS configuration does not provide the opportunity for an aircraft to safely transition in the event the aircraft exits the EMAS bed and enters the harbor. The existing RSA configuration is also a barrier to providing emergency vehicles easy or safe access to or from the water. As a condition to the installation of the EMAS bed, the FAA required Massport to examine opportunities to increase the level of safety at the Runway 22R end. The No-Action/No-Build Alternative would not increase the safety of the Runway 22R end and would not meet Massport or FAA's safety goals and the project Purpose and Need.

5.2.1.2 Minimization

Throughout the concept design process, Massport and FAA have evaluated opportunities to minimize impacts to the extent practicable, and will continue to work to minimize these impacts as the design of the safety improvements and agency review progresses. The Secretary's Certificate required that Massport continue to evaluate design modifications to further minimize impacts. The Certificate specifically directed Massport to consider a pile-supported structure for Runway 22R, like that proposed for the Runway 33L safety enhancements, as an approach to reducing impacts to salt marsh. After initial consideration, this concept was dismissed since the deck would substantially impair salt marsh due to shading and therefore would not avoid or minimize key impacts.

As discussed in Chapter 2, *Alternatives*, the proposed Inclined Safety Area (ISA) for Runway 22R cannot be constructed on pilings because it would exceed the FAA's cost limits in all events and would not eliminate the salt marsh or other coastal resources impacts. Two other minimization options were evaluated during preparation of the Draft EA/EIR, as described below:

- Reduce the width of the ISA from 500 feet to 300 feet. This concept was evaluated but rejected by FAA as being incompatible with the safety objectives of the proposed project. The existing RSA at the Runway 22R



end is 500 feet wide. This provides a safe width to allow aircraft that leave the runway to come to a stop. The ISA needs to be the same width as the RSA so that aircraft, should they leave the runway and miss the existing 170-foot wide EMAS bed, can safely transition into the water. A 500-foot wide ISA is required at the Runway 22R end because there are no navigational aids at this location that would help a pilot remain on the runway centerline in the event of an overshoot.

- Reduce the length of the fill. The proposed ISA provides a 12.3 percent slope from the existing RSA to the water. A steeper slope of the ISA would not be consistent with the safety objectives of the proposed project, since reducing the length of the fill would increase the risk of damage to an aircraft, and would be too steep for emergency response personnel or vehicles to reach an aircraft on the ISA or in the water. This alternative also would not avoid salt marsh impacts.

5.2.1.3 Compensatory Mitigation

As described above, because of the proximity of the salt marsh resources to the existing runway end, there are no practicable alternatives to construct safety enhancements at this location without directly affecting salt marsh resources. Accordingly, this section includes a summary of the compensatory mitigation goals, an overview of the salt marsh status and restoration efforts within Boston Harbor, and a description of the site selection criteria, evaluation and recommendations.

To mitigate for unavoidable impacts, Massport developed and proposed a salt marsh mitigation process in consultation with the Salt Marsh Working Group, as described in Chapter 7, *Public and Agency Involvement*. The Salt Marsh Working Group is comprised of representatives of the following agencies: Federal Aviation Administration (FAA), USACE, U.S. Environmental Protection Agency (USEPA), Massachusetts Office of Coastal Zone Management (CZM), DEP, Massachusetts Department of Conservation and Recreation (DCR), Massachusetts Department of Fish and Game Division of Ecological Restoration (DER, formerly CZM WRP), and the Boston Environment Department. The mitigation process includes the following steps:

- **Identify Goals**—Quantify unavoidable loss of salt marsh and intertidal beach, establish area and elevation goals; determine geographic extent of study area, and develop base map of study area.
- **Establish Watershed Needs**—Summarize available information on Boston Harbor salt marshes, trends, values, needs.
- **Seek expert panel input**—Meet with Salt Marsh Working Group, and develop working list of potential sites, projects.
- **Identify and evaluate potential sites**—Develop complete map of potential sites based on Working Group input, GIS analysis, and aerial photo interpretation. Evaluate each site based on location, ownership, constructability, functions, and prepare preliminary evaluation for Salt Marsh Working Group.
- **Develop a short list of sites for Draft EA/EIR**—Screen sites with Salt Marsh Working Group, develop draft report identifying range of reasonable mitigation sites, and incorporate findings in the Draft EA/EIR.

On October 23, 2009, February 22, 2010, June 9, 2010, August 19, 2010, and December 17, 2010, Massport met with the Logan RSA Salt Marsh Working Group to review mitigation goals, establish site selection criteria, and



evaluate potential mitigation sites. On January 5, 2011 Massport and members of the Salt Marsh Working Group visited the proposed Rumney Marsh mitigation sites and discussed design and construction methods.

Mitigation Goals

The proposed Runway 22R ISA would affect approximately 35,040 square feet of salt marsh and 26,630 square feet of intertidal mudflat. The 2:1 mitigation goal totals approximately 123,340 square feet (2.83 acres) for mitigation of both resources.

The USACE rules for compensatory wetland mitigation (33 CFR Parts 325 and 332, 10 April 2008) emphasize a watershed approach to selecting compensatory mitigation measures and locations. Four types of compensatory mitigation are recognized:

- Restoration/re-establishment of previously existing wetlands or other aquatic sites (this should be considered the first option) (2:1 recommended ratio for emergent wetlands);
- Enhancement/rehabilitation of an existing aquatic site's functions and values (3:1 to 10:1 ratio for emergent wetlands);
- Creation/establishment of a new wetland or aquatic site (2:1 to 3:1 ratio for emergent wetlands); or
- Preservation/protection of land that serves to protect aquatic resources by providing a buffer or corridor between aquatic resources (15:1 ratio).

Wetland mitigation banks, where available, and in-lieu fee programs, where available, may also be used to mitigate for unavoidable impacts. Wetland mitigation banks and in-lieu fee programs are not available for these resources in Massachusetts. The regulations recognize that mitigation may be located on-site (at or adjacent to the impact site) or off-site (at another location in the same watershed).

These regulations also recognize that compensatory mitigation must be commensurate with the amount and type of impact, and requires that the USACE determine what is practicable and capable of compensating for the aquatic resource functions that would be lost, and what is environmentally preferable. Considerations include:

- The likelihood for ecological success;
- The location relative to the impact site;
- The significance within the watershed; and
- The costs of the compensatory mitigation project.

The regulations require a watershed-based approach, ideally based on an existing watershed plan that provides information on the land uses, natural habitats, water quality, and aquatic resources within a watershed. The goal of using a watershed approach is to maintain and improve the quality and quantity of aquatic resources within a watershed, by strategically locating compensatory mitigation sites. The USACE rules also note that compensatory projects should not be located where they will increase the risks to aviation by attracting wildlife near airports.



The DEP has historically required 2:1 replacement/creation on similar safety projects as part of a Massachusetts Wetlands Protection Act (MA WPA) variance and references this mitigation ratio in its June 22, 2010 letter. The DEP typically seeks strict replication by requiring mitigation sites to be on-site or adjacent to the affected site, in the same watershed, and in-kind with the same elevation, habitat type, hydrological connection, ecological functions, and other key characteristics. Higher ratios tend to be required for restoration, enhancement, or preservation. Therefore, based on current guidance, USACE and DEP require a mitigation goal of 2:1 replacement of filled wetland if the mitigation method were restoration (of formerly filled salt marsh).

Site Selection

Massport conducted an iterative site selection process in conjunction with the Salt Marsh Mitigation Group to identify a wide range of potential sites for salt marsh restoration, creation, or enhancement. This site selection process was described in detail in the Draft EA/EIR (Section 5.2.1.3).

The site identification criteria considered FAA's requirements for wildlife hazards. FAA Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* (August 28, 2007) provides standards, practices and recommendations to assist airports to comply with the wildlife hazard management requirements of Title 14 CFR Part 139, *Certification of Airports*. As the AC notes, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide as well as billions of dollars in aircraft damage. Wildlife hazards are constructed or natural areas that encourage wildlife to enter an airport's approach or departure airspace and present potential hazards to aviation. The AC establishes a minimum separation distance of 10,000 feet between an airport's Aircraft Operating Area (AOA), the ground surface on which airport operate, and any hazardous wildlife attractant. The AC further recommends a 5-mile separation between the airport and a hazardous wildlife attractant on the approach and departure paths. Section 2-4 of the AC specifically addresses wetlands. Paragraph (c) notes that mitigation for wetland impacts from airport projects must be designed so it does not create a wildlife hazard. FAA recommends that wetland mitigation projects that may attract hazardous wildlife be outside of the separation distances (10,000 feet and 5 miles) unless the wetlands provide unique functions that must remain on-site. The FAA and the USACE have signed a Memorandum of Agreement concerning the implementation of the AC with regard to Section 404 permits.

A total of 40 potential sites, including 32 main sites and eight sub-sites/polygons (a, b, and/or c) located next to the main sites, were identified in the initial screening and were reviewed by the Salt Marsh Mitigation Working Group (see Figure 5-1). Sixteen of these potential sites were identified by USEPA, three by DER, and one by USACE. A total of twelve sites were identified by the consultant team (two are within the airport boundary or owned by Massport, which were ultimately dismissed due to proximity to active runway surfaces). Of the 40 sites identified, a shortlist of sites (ten sites) was advanced to field reconnaissance. The ten sites were advanced based on the preliminary screening criteria and on additional feedback received from the Salt Marsh Working Group during the February 22, 2010 meeting. Two additional sites were added after consultation with the Neponset River Watershed Association (NepRWA) and the National Park Service. A set of evaluation criteria was developed based on feedback received from the Salt Marsh Working Group and observations made in the field. These criteria were used to rank various potential restoration site constraints ranging from ownership, costs to restore, and apparent risks of mitigation failure.



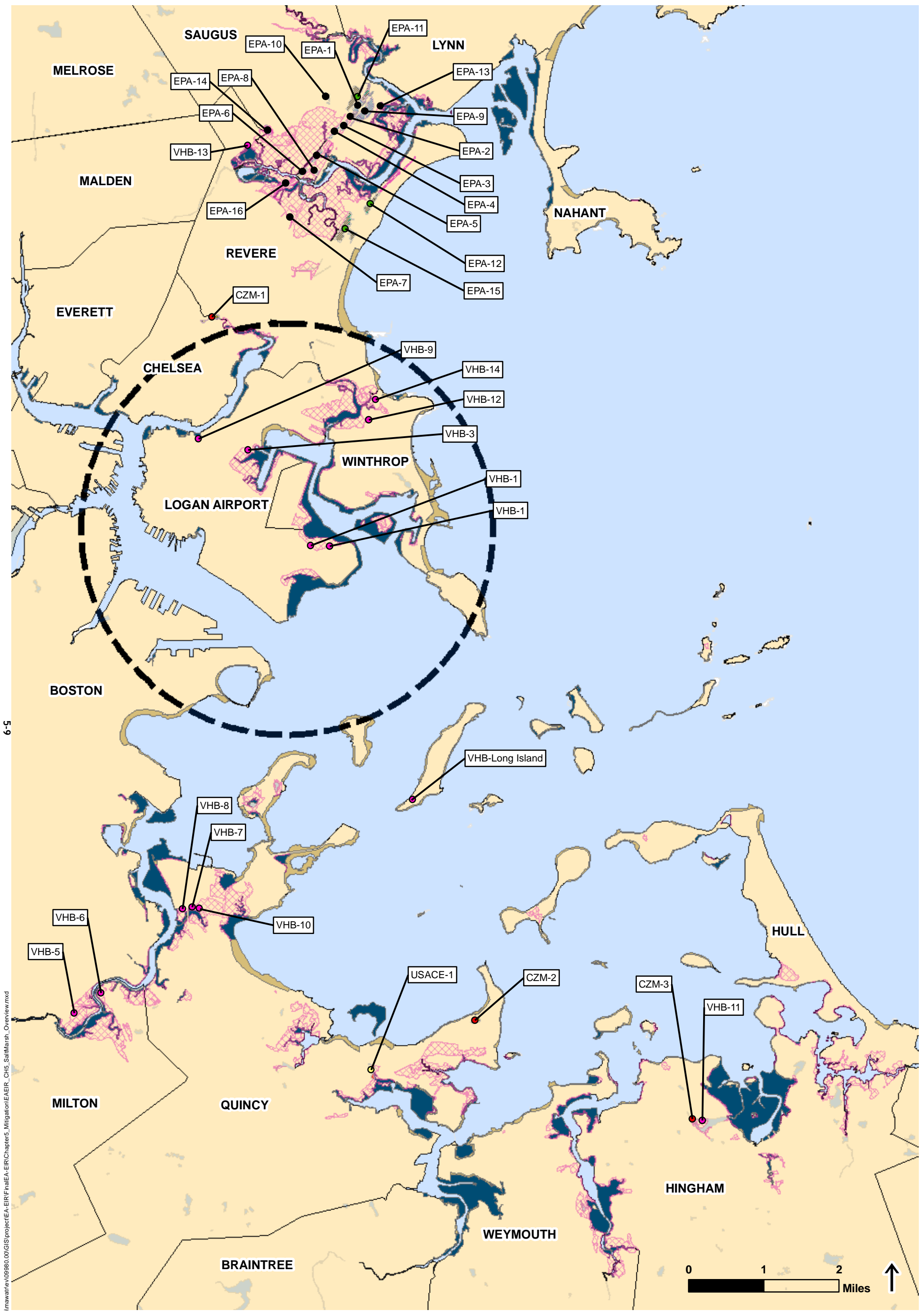
The site selection process identified formerly filled salt marsh within the Rumney Marsh Area of Critical Environmental Concern as the preferred restoration sites. These sites are located on a linear fill originally constructed as the alignment for Route I-95; a project which was later abandoned without being completed. The abandoned I-95 alignment is owned by DCR and used as a recreational site, especially for walking (e.g., dog walking). Several ad hoc trails crisscross areas within and adjacent to the potential restoration sites. A recreational model aircraft facility is maintained on two acres of I-95 fill approximately 800 feet north of the Pines River. A portion of the I-95 berm was previously restored as mitigation for a dredging project, and created 5 acres of intertidal shellfish habitat. The preferred sites were identified as EPA-4 and EPA-5 (see Figure 5-2).

- **EPA-4:** This site is a fill area of approximately 4 to 5 feet above the adjacent marsh elevation; however there are smaller areas as much as 18 feet above the marsh elevation. The site is poorly vegetated, and there would be minor existing habitat loss if converted. There is a large channel cut through the marsh adjacent to the restoration site. The recommendation is to advance the site because it is protected from high energy tide channels and wave erosion by the existing marsh. There is a long fetch across the Rumney Marsh during high tides; therefore the size/number of the opening to the larger marsh needs to be taken into consideration. It is an ideal site for restoration
- **EPA-5:** This site is proximate and very similar to EPA-4. The recommendation is to advance the site because it is very similar to EPA-4. These two sites appear to offer the best opportunities for successful marsh restoration.

The salt marsh restoration site at Broad Meadow in Quincy, Massachusetts, was considered as a potential mitigation site. The majority of this site is currently being restored by the USACE, in partnership with the City of Quincy, but there is not sufficient funding to complete the project. Massport evaluated this site and, with the concurrence of the Salt Marsh Working Group, determined that Broad Meadow was not the preferred site because it could not be configured to provide the require intertidal flats and low salt marsh vegetation at a reasonable cost (comparable to restoring salt marsh in the Rumney Marsh).

As part of the mitigation planning effort, at FAA's request, Massport has initiated coordination with the USDA, Animal & Plant Health Inspection Service, Wildlife Services. USDA will assist in the final screening of salt marsh and eelgrass mitigation strategies by reviewing the alternatives for consistency with FAA Advisory Circular AC 150/5200-33B "Hazardous Wildlife Attractants on or near Airports" and to determine compatibility with safe airport operations. Salt marsh restoration at Logan Airport is not recommended because increasing salt marsh within the Wildlife Hazard Area (WHA) could constitute an increase in wildlife habitat which has the potential to create or exacerbate bird hazards at low tide (feeding by brant, Canada geese, or other waterfowl). The FAA Wildlife Hazard Guidance specifies a separation distance of 10,000 feet from aircraft movement areas (runways, taxiways) to hazardous wildlife attractants.⁵ USDA-APHIS Wildlife Services has concurred that mitigation sites outside the Wildlife Hazard Advisory areas, such as the proposed Rumney Marsh restoration site, do not constitute hazardous wildlife attractants.

⁵ U.S. Department of Transportation, Federal Aviation Administration. Airport Design Advisory Circular No 150/5200-33B. August, 2007.



6-5

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<p>Legend</p> <ul style="list-style-type: none"> Wildlife Hazard Area Existing and Recently Restored Salt Marshes Coastal Beach Tidal Flat Town Boundaries Open Water 		<p>Salt Marsh Mitigation Sites Types</p> <ul style="list-style-type: none"> USACE (Potential) CZM (Priority) EPA (Future) EPA (Potential) VHB (Potential) 		<p>Logan RSA</p> <p>Figure 5-1</p> <p>Potential Salt Marsh Mitigation Sites</p> <p><small>Source: MassGIS Vanasse Hangen Brustlin, Inc.</small></p>
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


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Legend

-  Salt Marsh Mitigation Sites
-  Existing and Recently Restored Salt Marsh
-  Town Boundaries



Logan RSA

Figure 5-2

**Salt Marsh Mitigation
EPA Sites 4 and 5**



5.2.1.4 Salt Marsh Restoration Plan

The following is a summary of description of the conceptual salt marsh restoration plan that would be implemented at the selected mitigation site(s). The Secretary's Certificate on the Draft EA/EIR required that the plan provided in the Final EA/EIR include:

- Plans showing plan views, cross-sections, and planting plans;
- Plans showing identifiable landmarks;
- Grading showing 1-foot contour intervals and spot elevations;
- Internal drainage creeks, pannes, and intertidal flats;
- Invasive species control measures;
- Wildlife habitat features;
- Post-construction monitoring.

Preliminary grading plans are currently being developed as part of the permit applications. The following text provides a narrative description of the key elements of the mitigation design.

Description

The proposed wetland restoration area will provide salt marsh (estuarine intertidal emergent persistent) habitat and intertidal (marine intertidal unconsolidated shore mud habitat. The wetland mitigation area will provide geomorphic fringe habitat with bidirectional lateral flows equivalent to those lost as a result of the proposed RSA improvements. Wetland Mitigation Area A will provide approximately 2.36 acres of salt marsh habitat and approximately 1.1 acres of intertidal habitat within the Rumney Marsh Reservation (see Figure 5-3).

Massport is developing a Memorandum of Agreement with DCR for salt marsh mitigation at the Rumney Marsh sites. DCR anticipates that the sand excavated from Rumney Marsh would be used for beach nourishment at Revere Beach. In consideration for the use of DCR property, Massport has agreed to seek permits for Wetland Mitigation Area B (see Figure 5-4), which will provide 3.04 acres of salt marsh and associated habitat which DCR would construct as mitigation for DCR's previously-permitted Nahant Causeway Project.

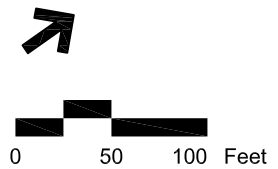
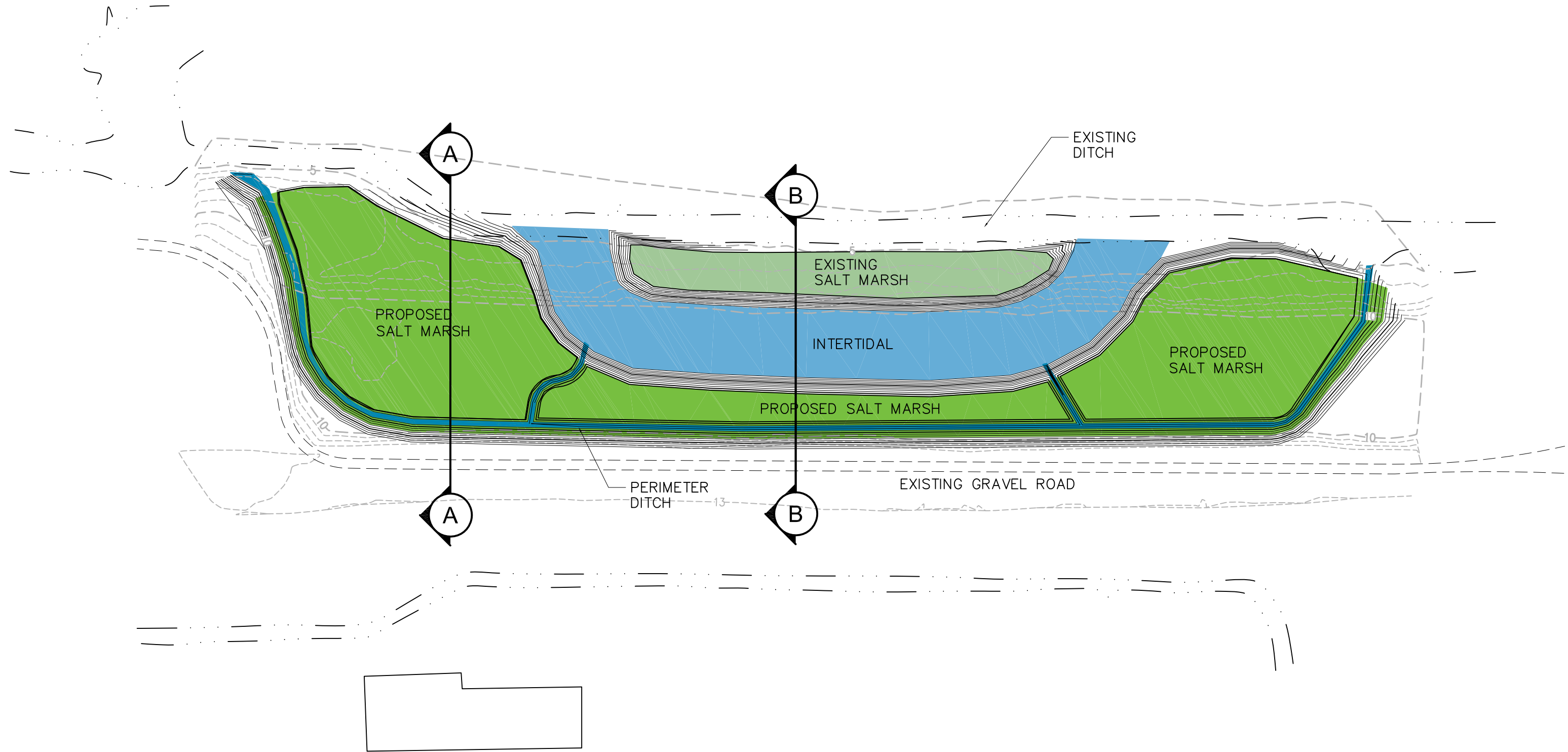
Erosion Controls

An erosion and sedimentation control program will be implemented to minimize temporary impacts to wetland resource areas. The program incorporates Best Management Practices (BMPs) specified in guidelines developed by the DEP⁶ and the USEPA.⁷

Temporary devices and structures to control erosion and sedimentation in and around mitigation sites shall be properly maintained at all times. The devices and structures shall be disassembled and properly disposed of as soon as the site is stable. Sediment collected by these devices will be removed and placed upland in a manner that prevents its erosion and transport to a waterway or wetland.

6 DEP, 1997. Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide for Planners, Designers, and Municipal Officials.

7 EPA, 1992. Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices. Office of Water Report EPA 832-R-92-005.

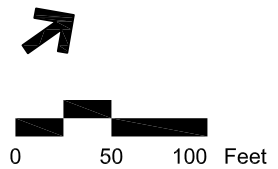
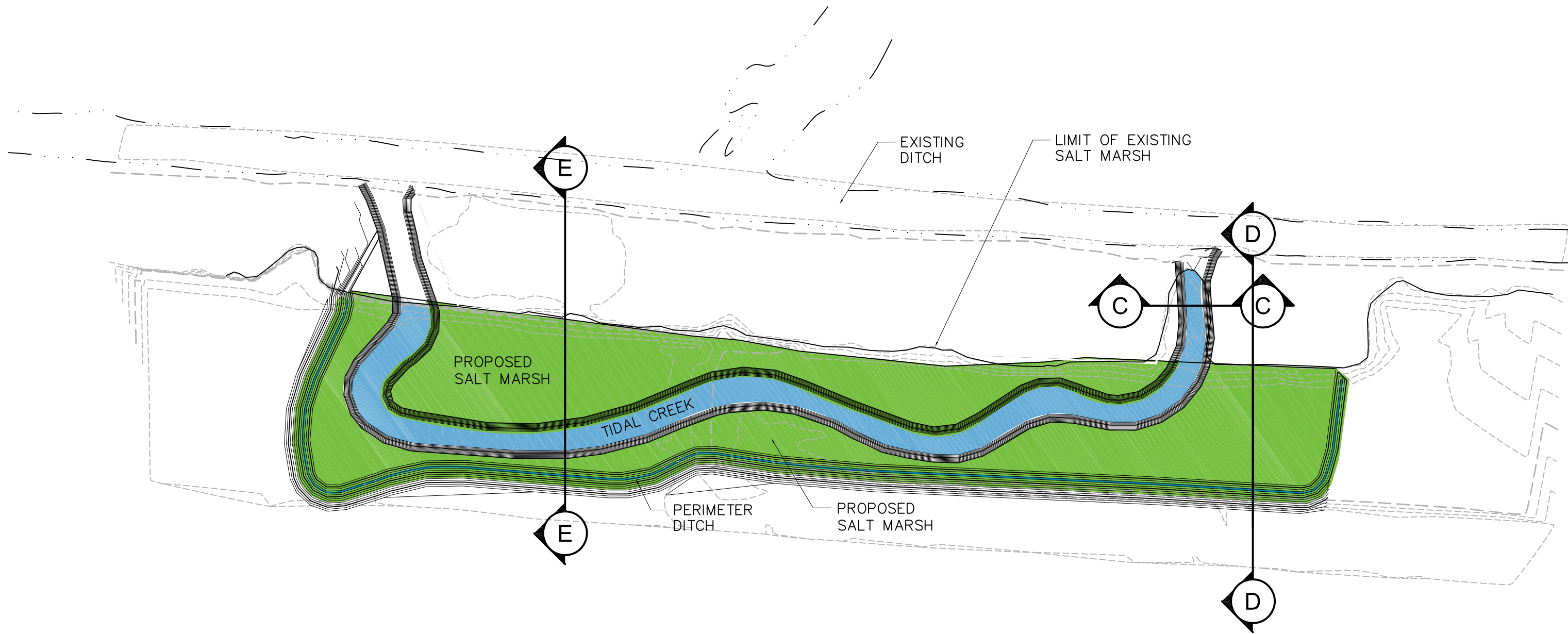


Logan RSA

Figure 5-3
Salt Marsh Mitigation Site A
(EPA Site 4; Salt Marsh Restoration Area 2)
Conceptual Plan



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Logan RSA

Figure 5-4
Salt Marsh Mitigation Site B
(EPA Site 5; I-95 Salt Marsh Restoration Area 3)
Conceptual Plan



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Grading

Creation of the salt marsh mitigation sites will require excavation of fill and grading to match the adjacent existing salt marsh elevations of ± 5.0 feet NGVD, grading down to elevation 3 feet NGVD. Tidal flats and swales will be graded to approximately elevation -1.0 feet NGVD, from the lower limit of salt marsh.

The finished grade of the salt marsh mitigation areas will be at an elevation that provides a hydrologic connection (tidal flow) between the restoration area and the adjacent/reference marsh wetland. The correct elevation is critical to achieving the proper tidal flooding characteristics for the desired vegetation community type (e.g., *Spartina alterniflora*, low marsh). Grading will be designed to provide surface irregularities (shallow pools, channels) to enhance habitat functions. The final grading of the marsh soils will result in no breaks in the elevation upon removal of siltation barriers and other erosion control devices.

Planting

Salt marsh vegetation would be established by transplanting salt marsh from the area of the proposed ISA at the Runway 22R end. Salt marsh would be excavated to a depth of at least 18 inches, in sections approximately 12 inches square. These salt marsh units would contain salt marsh plants, peat soils, algae and invertebrates. The units would be transferred to the graded, restored salt marsh, placed on the new substrate (dug in to the appropriate elevation, and staked in place to prevent transport by wave action or ice scour. If required by the regulatory agencies, additional plantings of dominant salt marshes species (salt meadow cord grass, *Spartina patens*, and salt marsh cord grass, *Spartina alterniflora*) from local and regional nurseries that specialize in products for wetland restoration and creation projects would be used to augment the transplanted salt marsh.

Invasive Species Control

The mitigation sites are adjacent to areas containing the invasive species common reed (*Phragmites australis*). Tall pepperweed (*Lepidium latifolium*) is a new salt marsh exotic invasive species that may also be present in the surrounding landscape and colonize the mitigation area.

To protect the functions and integrity of the mitigation areas, each mitigation area will be inspected in the early growing season of each monitoring year. If feasible, any exotic invasives will be pulled by hand and/or controlled using herbicides. A licensed pesticide applicator will be contracted to spray plants with the appropriate herbicide. Spraying will be done using a backpack unit and dye mixed with the liquid herbicide to minimize overspray and damage to native wetland species.

Wildlife /Fishery Habitat Features

The salt marsh and adjacent mud flats will contain tidal creeks, ditches and pools that provide habitat for wildlife species. Rocks and driftwood will be placed within the salt marsh, particularly at the marsh/upland interface to improve wildlife habitat by providing perches and shelter.



Monitoring

To help determine and measure restoration success, the salt marsh restoration site will be compared with adjacent and/or "undisturbed" reference wetlands for monitoring. The reference sites will be within the Rumney Marsh, and will be similar in terms of geomorphology, tidal range, and elevation. As determined appropriate, the parameters that would be monitored at salt marsh restoration and reference sites include:⁸

- Surface topography and elevation
- Tidal creek cross-sections
- Water table depth
- Surface water level changes
- Soil organic matter
- Sediment accretion rates
- Plant species distribution and cover
- Benthic invertebrate communities
- Utilization of the marsh by finfish and crustaceans
- Utilization of the marsh by wildlife

The duration and frequency of monitoring must be sufficient to determine if the restoration site is functioning similarly as the reference sites. The recommended monitoring duration of salt marsh restoration projects are at one year, two years, and three to five years post-restoration (Neckles and Dionne, 1999).⁹

Following construction of the mitigation sites, the sites will be monitored and monitoring reports will be prepared in the format required by the USACE Mitigation Guidance. Observations will occur at least two times during the growing season (in late spring/early summer and again in late summer/early fall). Each annual monitoring report will be submitted to the USACE, Policy Analysis and Technical Support Branch, no later than December 15 of the year being monitored. Failure to perform the monitoring and submit a monitoring report constitutes permit non-compliance. A self-certification form will be completed, and signed as the transmittal coversheet for each annual monitoring report and will indicate the permit number and the report number. The reports will address the following success standards in the summary data section and will address the additional items noted in the monitoring report requirements, in the appropriate section. The reports will also include the monitoring report appendices listed below. The first year of monitoring will be the first year that the site has been through a full growing season after completion of construction and planting. For these special conditions, a growing season starts no later than May 31. However, if there are problems that need to be addressed and if the measures to correct them require prior approval from the agencies, Massport will contact the agencies as soon as the need for corrective action is discovered.

Remedial measures will be implemented prior to the completion of the monitoring period to attain the agreed-on success standards. Measures requiring earth movement or changes in hydrology will not be

8 Rhode Island Habitat Restoration Portal. Restoring Coastal Habitats for Rhode Island's Future. Habitat Monitoring Protocols. Website: http://www.edc.uri.edu/restoration/html/tech_sci/habsalt.htm

9 Rhode Island Habitat Restoration Portal. Restoring Coastal Habitats for Rhode Island's Future. Habitat Monitoring Protocols. Website: http://www.edc.uri.edu/restoration/html/tech_sci/habsalt.htm



implemented without written approval from the USACE and DEP. At least one reference site adjacent to or near each mitigation site will be described and shown on a locus map.

5.2.1.5 Mitigation Costs

Since land acquisition is not required, salt marsh mitigation would require excavation of soils, planting, and monitoring for approximately 3 acres, estimated at approximately \$600,000 to \$1,100,000.

5.2.2 Eelgrass

Approximately 66,600 square feet of eelgrass (*Zostera marina*) beneath or adjacent to the footprint of the proposed pile-supported deck for the proposed Runway 33L RSA improvements is assumed to be lost or altered due to shading even though some eelgrass at the edge of the deck would still receive sunlight penetration for parts of the day. An additional area outside of the deck could be affected by construction activities such as barge anchoring or grounding, however these impacts are not predictable and are not included in the mitigation estimates. Massport will conduct post-construction mapping of the eelgrass bed, document any additional construction impacts, and restore those areas in place by transplanting eelgrass from the adjacent undisturbed bed. This temporary impact area would be monitored using the same protocols outlined for the eelgrass restoration area described below.

The MEPA Certificate for the RSA Improvements Project included a number of specific requirements for eelgrass mitigation to be addressed in the Final EA/EIR. These requirements include:

- a schedule to minimize and/or eliminate the risk of impacts from construction vessels;
- documentation that the proposed eelgrass mitigation plans are consistent with methodologies critical to the success of eelgrass restoration efforts;
- information on the collection of field data and a site-selection modeling effort;
- a discussion and assessment of the potential eelgrass mitigation sites identified as part of the Hubline project and how the findings of that study assisted Massport in choosing suitable transplant sites;
- a survey of other sites in the outer harbor not assessed in the Hubline study, with appropriate physical and biological characteristics that optimize eelgrass survival;
- a discussion of how the eelgrass plant stock in the footprint of the construction area will be preserved for use as donor stock and a timetable of the sequencing steps to ensure optimal eelgrass survival and transplanting success;
- a commitment to post-construction and long-term post-construction monitoring of any proposed mitigation sites;
- documentation from the USDA-Wildlife Services as to whether eelgrass habitat constitutes an attractive wildlife nuisance;
- a monitoring plan to track the success of eelgrass transplant efforts and the criteria to be used to measure the success of the restoration effort; and



- remedial plans to be undertaken in the event that initial restoration efforts fail;

This following sections describe how impacts from the proposed Runway 33L RSA improvements were avoided and/or minimized, consultation with the agencies, and proposed compensatory mitigation measures for unavoidable impacts to eelgrass, as requested by the Certificate.

The five construction options retained by Massport in order to maintain flexibility in the design/build process being undertaken for the Runway 33L safety improvements would have the same deck dimensions and therefore the same impacts to eelgrass, and have only small differences in the direct impacts of the pilings, which would range from 460 square feet to 1,175 square feet. The preferred alternative will be identified once the design/build contractor has been selected, and is likely to be a modification of one of these five construction options. Consistent with the requirement of the Secretary's Certificate on the Draft EA/EIR, Massport will continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree possible.

5.2.2.1 Avoidance

An extensive alternatives analysis was undertaken, as described in Chapter 2, *Alternatives*, of the Draft EA/EIR. The only alternative that would not impact wetlands or further reduce safety at Logan Airport is the No-Action Alternative. The No-Action Alternative is not an acceptable alternative because it does not meet the requirements of the 2005 federal mandate to increase the safety of RSAs at all U.S. airports including Logan Airport by 2015. Leaving the Runway 33L RSA in its current configuration does not increase the safety for aircraft and their passengers in emergency situations such as an overrun or undershoot situation.

As described in Chapter 2, *Alternatives*, several avoidance alternatives were evaluated and dismissed because they would not meet the project purpose or were not practicable. Runway 15R-33L, the longest runway at Logan Airport, is essential to the airport's role as the long-haul gateway for New England. The runway cannot be reduced in length because this would reduce utility, with a significant adverse impact on Logan Airport operations, particularly during less-than-ideal weather conditions where Runway 15R-33L provides the runway length needed for safe aircraft operations. Other avoidance alternatives were considered and dismissed that because of potential noise impacts to adjacent East Boston neighborhoods, impacts to other runways at Logan Airport, or increased penetrations to the Runway 15R approach surface and the Runway 33L departure surface. An alternative that meets the RSA safety goal must not do so by reducing the safety margin elsewhere.

5.2.2.2 Minimization

The alternatives analysis screened alternatives that would provide a standard RSA in compliance with FAA guidance. The current design guidelines allow for a standard RSA that is 1,000 feet long and 500 feet wide at each runway end, where the RSA is cleared and graded with no potentially hazardous ruts, humps, depressions, or other surface variations. At airports where space is limited and land is not available to accommodate the standard 1,000-foot long by 500-foot wide RSAs, the FAA has approved the use of EMAS to provide overrun protection.



Potential impacts to eelgrass have been significantly minimized through the alternatives analysis by:

- Utilizing EMAS rather than a full 1,000-foot long RSA;
- Selecting a deck and pile-supported structure rather than a solid fill structure that would have significant direct impacts to coastal wetlands;
- Relocating the perimeter road from the outer edge of the deck;
- Minimizing the width of the RSA from 500 to 303 feet on the deck, in compliance with FAA guidelines;
- Minimizing construction impacts due to barges by restricting barge movements to designated construction corridors and using spud-mounted barges rather than anchored barges; and
- Prohibiting barges, when not in use, from anchoring in eelgrass bed areas.

The alternatives analysis incrementally reduced the wetlands impact potentially resulting from the construction of a RSA at Runway 33L. The alternatives analysis considered both the standard 1,000-foot long and 500-foot wide RSA and smaller RSA footprints utilizing EMAS. Alternative 1 has the largest footprint at 1,000 feet by 500 feet. It would be a solid fill structure, and had the largest wetlands impact. Alternative 2 and Alternative 3 reduced the footprint through the use of EMAS, but still had large wetlands impacts. Alternative 2 also considered different design options such as filled structures and pile-supported decks but both had constructability issues. Alternative 4 has the smallest footprint on a pile-supported deck that still provides the degree of safety consistent with the FAA guidelines.

The environmental consequences of five piling construction options were evaluated in Chapter 4, *Environmental Consequences*. The deck would be the same size (approximately 303 feet wide and 470 feet long) for each option, but with different sizes, numbers and arrangements of supporting pilings. Each of the five construction options would result in the same impacts to eelgrass, since the overall size of the RSA deck would be the same in all five construction options. The proposed Runway 33L RSA improvements are anticipated to result in the loss of 66,600 square feet of eelgrass due to shading. Table 5.2-1 illustrates how impacts to Submerged Aquatic Vegetation (eelgrass beds) have been reduced in the second screening of alternatives. The most significant minimization strategy is the elimination of a solid fill structure and enhancing the existing EMAS bed which has the result of reducing the footprint and the resultant direct wetlands impacts.



Table 5.2-1 Runway 33L RSA Eelgrass Minimization Alternatives

Preliminary Alternative ¹	Submerged Aquatic Vegetation (sq. ft. of shading)
Alternative 1 – 1,000 –foot long by 500-foot wide RSA on Solid Fill	129,930
Alternative 2 – 600-foot long by 500-foot wide RSA with EMAS on Solid Fill	87,450
Alternative 3 – 600-foot long by 400-foot wide RSA with EMAS on Deck	71,420
Alternative 4 – 600-foot long by 300-foot wide RSA with EMAS on Deck ²	66,600 ³

- 1 The alternatives analysis reviewed different design options for each alternative. The largest area of wetlands impact of those design options is displayed in the table.
- 2 The additional 3 feet of deck width (over that presented in the Draft EA/EIR) is required to provide a curb to protect personnel and vehicles on the deck during an emergency from backing over the edge of the deck.
- 3 Includes shading adjacent to, as well as under, the deck.

5.2.2.3 Compensatory Mitigation

Impacts to Submerged Aquatic Vegetation (eelgrass) are the same for all proposed Runway 33L construction options. Shoreline structures built over the water, such as the proposed deck structure, prevent eelgrass from getting enough light for growth. Approximately 66,600 square feet of eelgrass bed would be lost or altered due to the proposed deck RSA improvement feature at the Runway 33L end. Based on the initial survey results, the eelgrass within this area varies in density from 5 percent to less than 40 percent. Approximately 400 square feet of eelgrass within the overall 66,600 square feet would be adversely affected due to scour created by the proposed pilings (for all piling options). Additional loss of eelgrass could be caused by the barges used in construction activities. These areas would be re-planted with eelgrass at the completion of construction. Massport will conduct a post-construction survey to assess the actual area of eelgrass impacts and will re-evaluate the mitigation goals at that time.

This section describes the federal and state mitigation goals and an overview of the status of proposed mitigation planning for context in evaluating mitigation strategies. An overview of the status eelgrass in New England, Massachusetts and Boston Harbor is provided. Eelgrass trends, losses, gains, and changes within Boston Harbor, as well as limiting factors to its survival, are provided as context for mitigation needs. This section also provides a summary of agency restoration efforts, current limitations and unknowns in the evolving science of eelgrass restoration, and the proposed mitigation commitments, potential sites, and restoration techniques.

Massport convened the Eelgrass Mitigation Working Group to provide expertise on the subject of eelgrass restoration/ re-establishment. The Working Group is comprised of representatives of the following agencies: FAA, USACE, USEPA, CZM, DEP, DCR, DER and DMF, and the Boston Environment Department. The Working Group has met seven times (April 17, 2009; July 9, 2009; July 31, 2009; March 19, 2010; June 9, 2010; August 19, 2010; and December 17, 2010). Massport proposed a mitigation process that includes the following steps:



- **Identify Goals**—Quantify unavoidable loss of eelgrass, establish mitigation goals; determine geographic extent of study area;
- **Establish Watershed Needs**—Summarize available, current information on Boston Harbor eelgrass beds;
- **Seek expert panel input**—Meet with Eelgrass Working Group to discuss the site selection process and develop working list of potential restoration sites; and
- **Identify and site selection process**—Based on Working Group input, GIS analysis, and aerial photo interpretation.

Mitigation Goals

The proposed Runway 33L RSA improvements does not meet the thresholds for coverage under the Massachusetts General Permit for activities in waters of the United States (U.S.) therefore, an Individual Section 10/404 permit from the USACE must be sought. The Addendum to the New England District Compensatory Mitigation Guidance provides a recommended compensatory mitigation ratio of 3:1 to 5:1 for Submerged Aquatic Vegetation.¹⁰ These ratios provide guidance for all compensatory aquatic resource mitigation required by New England District. At the state level, MA DEP indicates that damage to eelgrass habitats must be mitigated at a ratio greater than 1:1. Based on this guidance, the mitigation goal for the Runway 33L RSA improvements is 3:1, approximately 4.6 acres (66,600 square feet x 3 = 4.6 acres).

Site Selection

Massport completed a site selection study, in consultation with the Eelgrass Mitigation Working Group. The two-phase study included a preliminary site analysis using existing data sets, and field investigations of the selected sites. The site analysis used information from previous studies conducted by DMF and by Battelle, Inc., for the Hubline project.

To select potential restoration sites, the desiccation, percent Photosynthetically Active Radiation (PAR) at depth, and sediment type parameters from the Battelle model were used. Wave energy (and exposure) did not appear to greatly influence the Battelle model results and was not included in the analysis. Both a normal and a conservative estimate for PAR at depth was used, the latter as a surrogate for the effects of above average rainfall, cloud cover and tides experienced in summer of 2009. Specifically, percent PAR at depth was recalculated by increasing depth by 0.1 m to simulate the higher than normal tides, and reducing incoming PAR by 10% as a surrogate for the effect of increased cloud cover, rain and wind driven turbidity. The revised model was used to re-evaluate restoration areas identified by the DMF model that are not currently slated for restoration, and 2009 Battelle test transplant sites that had poor survival results. Sites with PAR greater than or equal to 20 percent under both the normal and reduced PAR scenarios were selected for additional evaluation.

Based on the results of this analysis, six primary and three backup locations were chosen for field investigation (see Figure 5-5):

¹⁰ U.S. Army Corps of Engineers, Addendum to New England District Compensatory Mitigation Guidance: Compensation for Impacted Aquatic Resource Functions, File No. NAE-2006-3648, December 18, 2007.



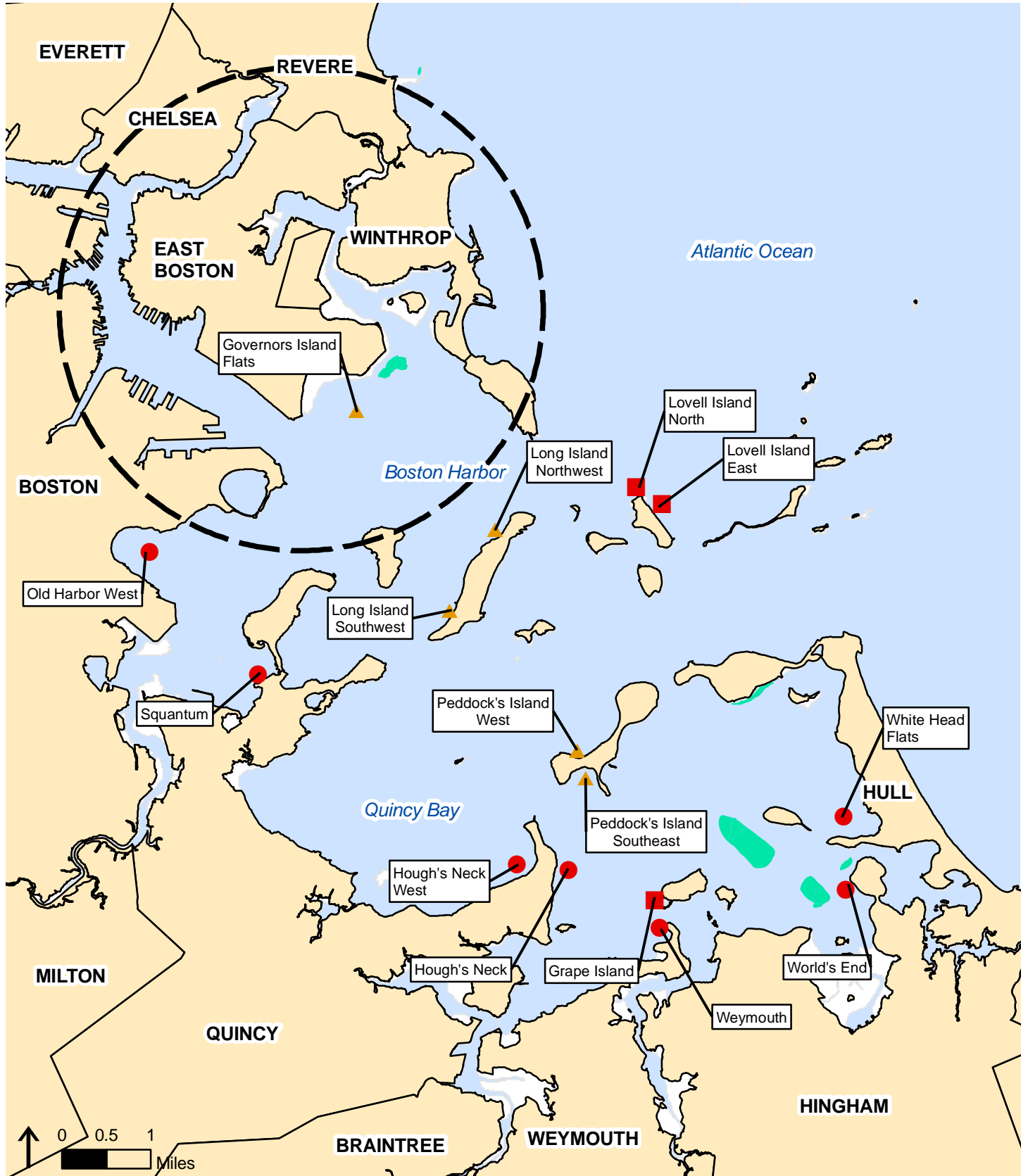
- Primary Sites
 - Hough's Neck East (Quincy)
 - Hough's Neck West (Quincy)
 - Old Harbor West (Boston)
 - Squantum (Quincy)
 - White Head Flats (Hull)
 - World's End (Hingham)
- Backup Sites
 - Grape Island (Boston)
 - Lovell Island East (Boston)
 - Lovell Island North (Boston)

The site selection study and list of field sites was reviewed and approved by the Eelgrass Working Group prior to field work.

Field investigations were conducted in October, 2010. For each survey area, percent PAR at depth was calculated for the survey area using the field-measured bathymetry and the average extinction coefficient and the recalculated extinction coefficient derived from MWRA measurements. The side scan sonar results were used to roughly delineate sediment types across the survey areas based on the surface texture. Confirmatory grab sample and laboratory grain size data were used to classify the sediment type within each area. Percent PAR and sediment type results were used to identify potential eelgrass restoration areas within the survey boundaries.

Sediment samples were submitted for grain size analysis from five sites: Old Harbor, Squantum, Grape Island, World's End, and White Head Flats. The remaining four sites were predominantly gravel/cobble and considered unsuitable. The results of the laboratory grain size analysis indicate that three of the sites from which samples were submitted have substantial areas of suitable sediment type of fine to medium sand with less than 20% fine sediments. The assessment of PAR focused on the five sites with areas of suitable sediment. Percent PAR calculated using measure light extinction resulted in highly suitable light availability for four sites. The field analysis also considered the presence of algae.

Although conditions within each site varied, the field study found that the White Head Flats and Old Harbor were most suitable for eelgrass establishment based on light availability and sediment suitability. There are approximately 46 acres of suitable habitat at White Head Flats and Old Harbor. The suitability of the Whitehead Flats area is further demonstrated by presence of eelgrass at the northern end of the survey area. The Squantum site had suitable sediment and light availability. However, at the time of the field investigation, the areas of suitable sediment were covered by an algal mat. The presence of abundant algae may indicate high nutrient conditions which could support epiphytic algae on transplanted eelgrass, reducing available light. The eastern portion of Squantum appeared to have less algae and may be suitable. The World's End and Grape Island sites had less suitable sediment and/or abundant algae.



Legend

- | | |
|--|------------------------|
| ● Primary Mitigation Site | ▭ Wildlife Hazard Area |
| ■ Backup Mitigation Site | ▭ DEP-Mapped Eelgrass |
| ▲ Existing DMF Large-scale Transplantation | ▭ Town Boundaries |
| | ▭ Open Water |



Logan RSA

Figure 5-5
Potential Sites for Eelgrass Mitigation

Source: MassGIS
Anchor QEA



Massport therefore proposes to restore 4.6 acres of eelgrass habitat at the two most suitable sites, White Head Flats in Hull and Old Harbor in Boston (Figures 5-6 and 5-7). At the December 17, 2010 Eelgrass Mitigation Working Group meeting, the resource agencies concurred with this proposal. USDA-APHIS Wildlife Services has concurred that proposed eelgrass mitigation sites beds more than 10,000 feet from an aircraft operating area do not constitute a hazardous wildlife attractant.

Eelgrass Restoration Methodology

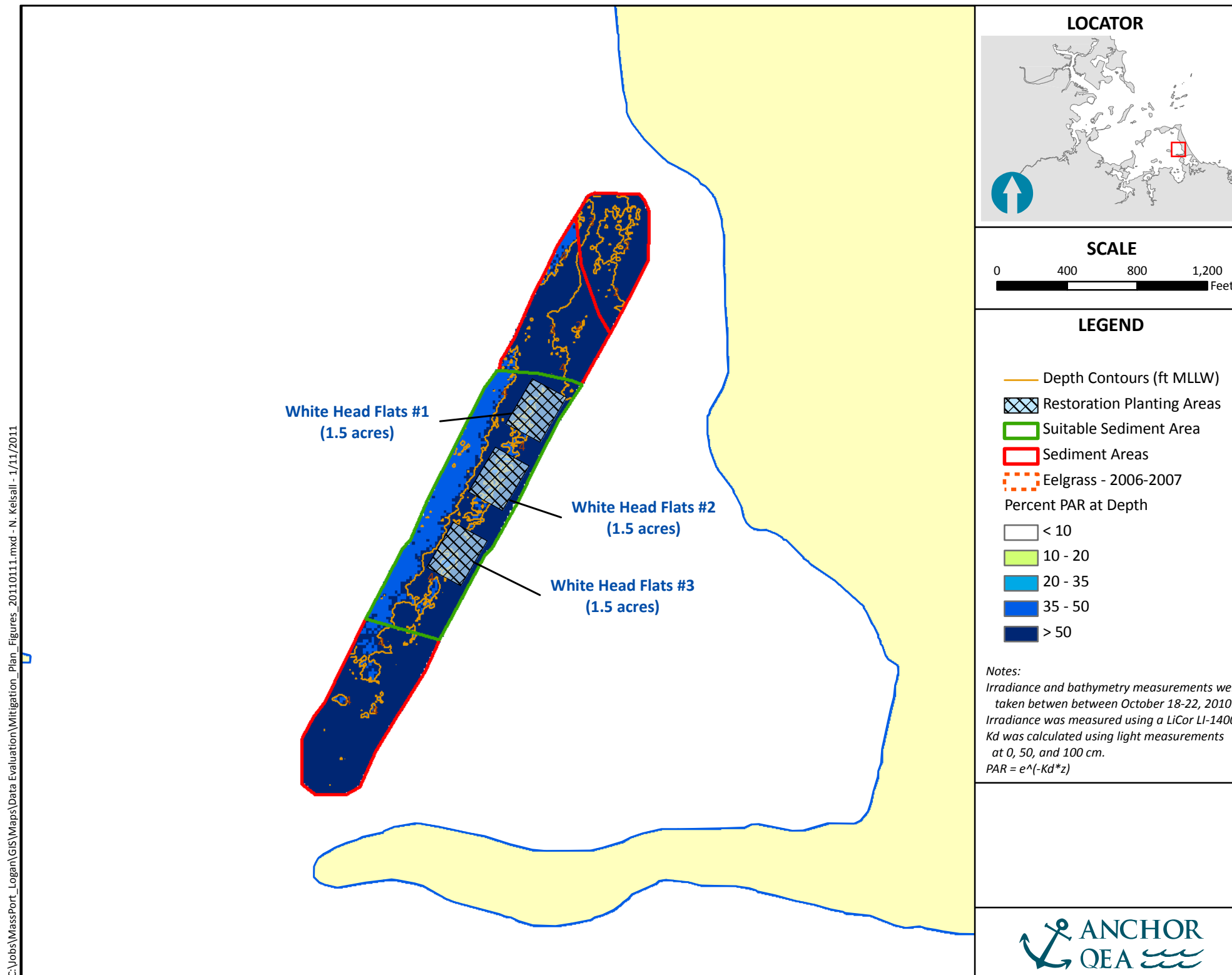
Eelgrass will be removed by hand or the “clump method” following methods in Davis and Short (1997) and Leschen et al. (2009) from the Runway 33L bed within the area that will be directly impacted by construction activities (donor site). The collection methods involve removal of individual or small clusters of eelgrass shoots, rhizomes and roots with minimal disturbance to the sediment and surrounding eelgrass. Because the harvesting will occur within the construction area, as many shoots as possible will be collected. Harvested eelgrass will be stored in catch bags until brought to the surface. Once on the surface, eelgrass will be temporarily stored in coolers and kept moist for transport to the transplant site. Collected plants will be transferred to in-water holding containers (e.g., lobster traps) and maintained in ambient site conditions at or near the transplant site. Transplanting is anticipated to begin in early to mid May 2011.

Based on the analysis presented in the Draft EA/EIR, approximately 60,100 square feet of eelgrass habitat are located within that footprint which is anticipated to provide a sufficient number of shoots for transplanting. If, at the time of harvesting, it appears there are insufficient quantities of eelgrass shoots at the Runway 33L site, additional eelgrass may be collected from within the larger eelgrass bed at Governors Island Flats. Eelgrass from the donor site will be transplanted within 72 hours of collection.

Eelgrass will be planted on a checkerboard pattern (Figure 5-8) to balance between planting with sufficient densities and covering a large area, with resultant shoot density of approximately 22,500 shoots per acre (which is largely equivalent to planting an acre at 2 feet on center). The corners of all planting areas will be marked with screw anchor/bouys and GPS.

Three locations will be transplanted at White Head Flats, and one location will be transplanted at Old Harbor. The specific size and configuration of each location will be provided to the Eelgrass Mitigation Working Group prior to planting.

Eelgrass will be installed using the horizontal rhizome method (Davis and Short 1997) which has been used on numerous eelgrass transplanting projects in the Northeast. The method involves anchoring two adult shoots with overlapping rhizomes into the sediment bed with biodegradable anchors. Alternative transplant methods, such as seeding or Transplanting Eelgrass Remotely with Frames (TERFs), were not consider due to the time of year (before seed set) and logistics (distance between donor and transplanting sites), respectively.



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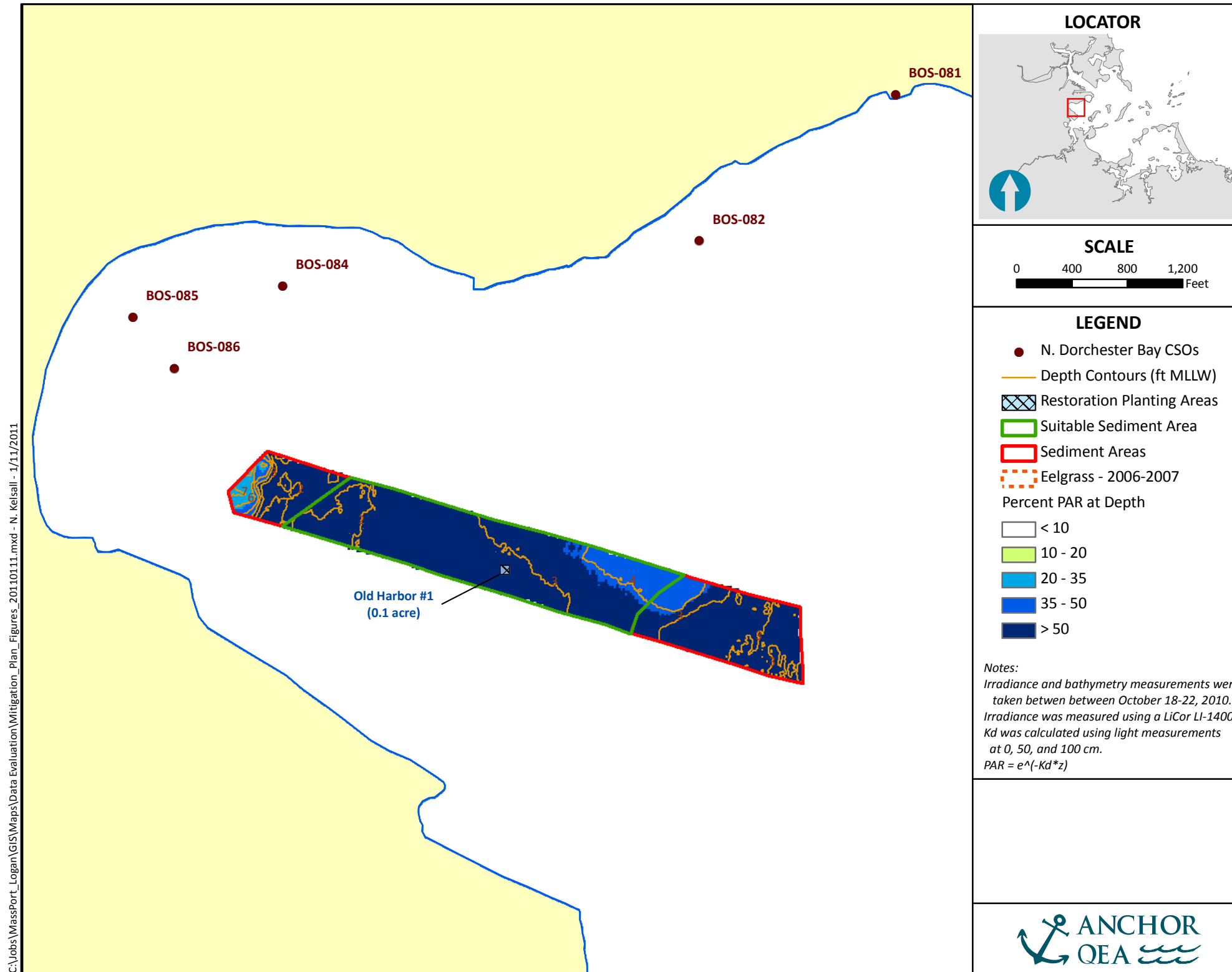
Logan RSA

Figure 5-6

Eelgrass Mitigation Planting Areas:
White Head Flats

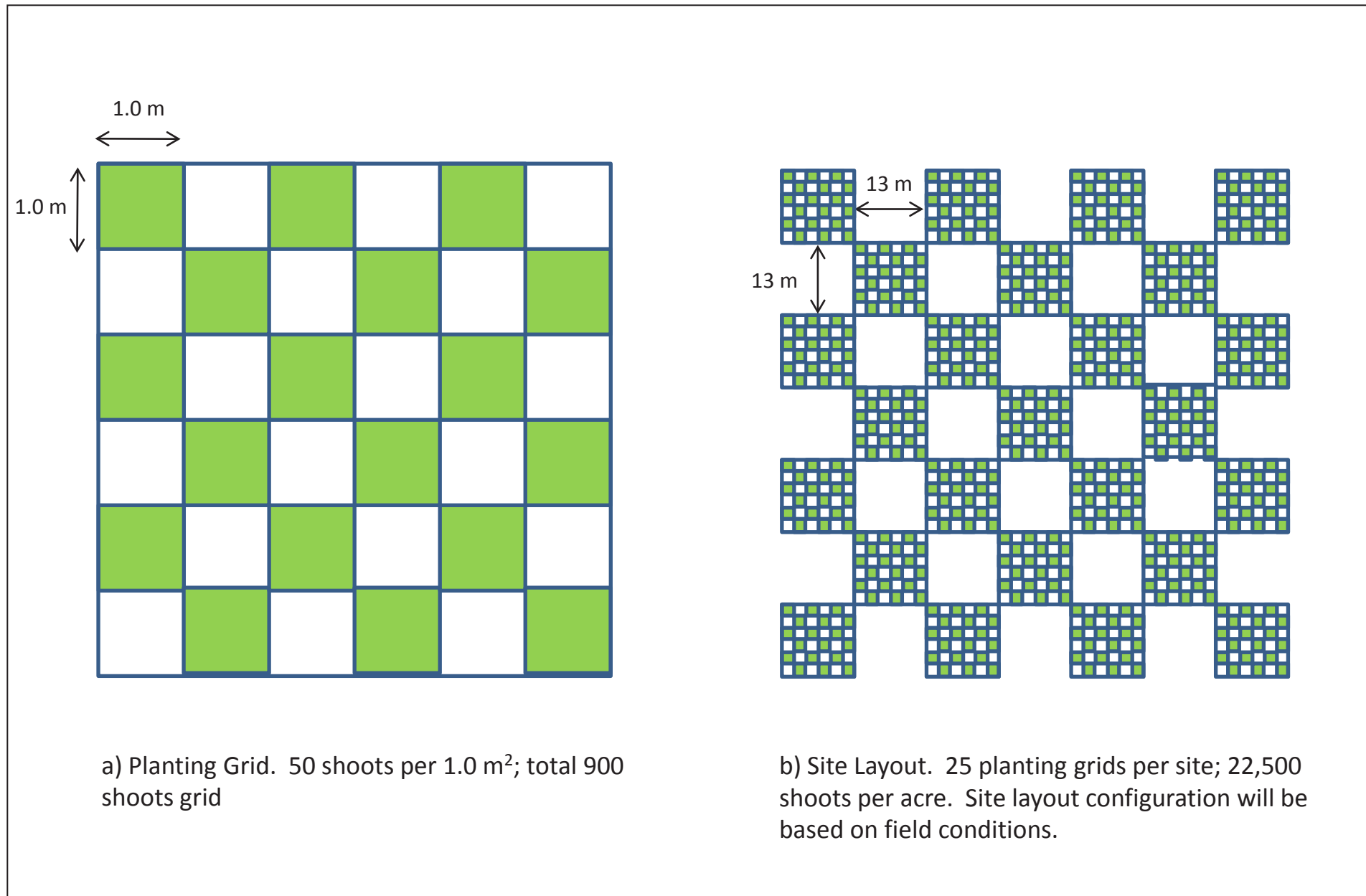


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Eelgrass Restoration Monitoring

Monitoring will be conducted in two phases: initial monthly monitoring to evaluate the survival of the transplanting eelgrass in the year of transplanting, and annual monitoring to determine the success of the transplanting effort. Monitoring will occur at both transplanted locations and reference beds. For this project, the eelgrass beds at White Head Flats and Worlds End will serve as reference beds. Monitoring locations will be marked with anchor screws/buoys and GPS.

Post-transplant monthly monitoring will include percent survival, percent cover, water quality and light availability from June through September. Percent survival and percent cover will be monitored at approximately 10 percent of planted grids at each site. Water quality and light availability will be monitored at each transplant site. In addition, monthly monitoring of percent cover, water quality and light availability will be conducted at reference eelgrass beds.

Annual monitoring will commence in the year following transplanting. The methods will be consistent with the DMF guidelines (Evans and Leschen 2009) and include:

- Percent cover;
- Shoot density;
- Canopy height;
- Presence / number of reproductive shoots;
- General site conditions (e.g., algal extent, presence of bioturbating organisms); and
- Areal extent.

These metrics provide important information about the functioning of the eelgrass bed without requiring the removal of any eelgrass from the site. Annual monitoring will occur in late June / early July at the time of maximum eelgrass establishment. Monitoring will include collection of data from nine locations within each transplant site and nine locations within a paired reference bed.

Monthly monitoring will commence in June 2011, following completion of transplanting activities. Annual monitoring will commence in June 2012. Monitoring results will be provided in an annual report by December 1 of each year. Annual monitoring is proposed to continue for five years, including the more intensive first year.

Monitoring reports will focus on the "success criteria" to be established through consultation with the Eelgrass Mitigation Working Group and as defined in the permits issued for construction of the Runway 33L RSA.

5.2.2.4 Mitigation Costs

The approximate range of eelgrass mitigation (re-establishment of 4.6 acres, a 3:1 ratio) is \$506,000 to \$656,000, based on a cost estimate of:

- Restoration: \$300,000 to \$400,000 (with contingency);



- Monitoring: \$206,000 to \$256,000 (with contingency) total at \$40,000 per year (assumes a 5-year monitoring program on one site with a single yearly monitoring event by divers, sample processing and yearly report, with a higher level of effort in the first year).

5.2.3 Land Containing Shellfish

According to the MA WPA, Land Containing Shellfish is found within other coastal wetlands resources subject to the jurisdiction of the MA WPA and it is a significant interest indentified in the MA WPA. The shellfish species that are characteristic of Land Containing Shellfish according to the MA WPA include bay scallop (*Argopecten irradians*); blue mussel (*Mytilus edulis*); ocean quahog (*Acrtica islandica*); oyster (*Crassostrea virginica*); quahog (*Mercenaria mercenaria*); razor clam (*Ensis directus*); sea clam (*Spisula solidissima*); sea scallop (*Placopexten magellanicus*); and soft shell calm (*Mya arenaria*). Land Containing Shellfish is significant to the protection of land containing shellfish and the protection of marine fisheries when it has been identified and mapped by the local conservation commission or the MA DEP in consultation with the DMF or in consultation with the local shellfish constable or the MA DEP.

The proposed RSA improvements would affect Land Containing Shellfish identified in the ends of Runway 33L and Runway 22R RSA. Approximately 450 to 1,100 square feet would be lost from pile or caisson installation, and approximately 4,320 square feet would also be lost to construction of the emergency access ramps on either side of the proposed Runway 33L deck. Approximately 62,370 square feet of Land Containing Shellfish would be affected due to the construction of the ISA at the Runway 22R end. This shellfish bed is rarely, if ever, harvested due to the low density of soft shell clams.

The MEPA Certificate included a number of specific requirements for shellfish mitigation to be addressed in the Final EA/EIR. These requirements include:

- Further refine shellfish mitigation plans to specify terms and procedures for the harvest and transplant of shellfish;
- Information on what monitoring will occur of invasive species and colonization by tunicates after the construction; and
- Propose mitigation for impacts to shellfishing.

5.2.3.1 Avoidance

An extensive alternatives analysis was undertaken, as described in Chapter 2, *Alternatives*, of the Draft EA/EIR. The only alternative that would not impact wetlands or further reduce safety at Logan Airport is the No-Action Alternative. The No-Action Alternative is not an acceptable alternative because it does not meet the requirements of the 2005 federal mandate to increase the safety of RSAs at Logan Airport by 2013. Leaving the Runway 33L RSA or Runway 22R RSA in their current configurations would not increase the safety for aircraft and their passengers in emergency situations such as an overrun or undershoot situation.

5.2.3.2 Minimization

Minimization measures were incorporated into the design process for both the proposed Runways 33L and Runway 22R RSA improvements. Massport has attempted to minimize impacts to the extent practicable, and



will continue to work to minimize these impacts as the design of the safety improvements and agency review progresses.

Runway 33L

The Proposed Action for the proposed Runway 33L RSA improvements has the smallest footprint on a pile-supported deck that still provides the degree of safety consistent with the FAA guidelines. Table 5.2-2 illustrates how impacts to Land Containing Shellfish were avoided via the alternatives screening process.

Table 5.2-2 Runway 33L RSA Land Containing Shellfish Minimization

Preliminary Alternative ¹	Impacts to Land Containing Shellfish (sq. ft.)
Alternative 1 – 1,000 -foot RSA on Solid Fill	537,400
Alternative 2 – 600-foot long by 500-foot wide RSA with EMAS on Solid Fill	200,940
Alternative 3 – 600-foot long by 400-foot wide RSA with EMAS on Deck	153,341
Alternative 4 – 600-foot long by 300-foot wide RSA with EMAS on Deck	123,080

¹ The alternatives analysis reviewed different design options for each alternative. The greatest wetlands impact of those design options is displayed in the table.

Massport has eliminated Preliminary Alternatives 1 through 3 from further analysis on the basis that these would have the greatest potential impact to Land Containing Shellfish and other environmental resources. The most significant minimization strategy is the elimination of a solid fill structure and enhancing the existing EMAS bed which has the result of reducing the footprint and the resultant direct wetlands impacts. The solid fill structure would have greater impacts than the proposed pile-supported deck.

The proposed safety improvement minimizes impacts to Land Containing Shellfish by:

- Utilizing an RSA with EMAS rather than a full 1,000-foot long RSA;
- Selecting a deck and pile-supported structure rather than a solid fill structure;
- Minimizing the width of the RSA in compliance with FAA guidelines; and
- Providing additional habitat for sessile benthic organisms, possibly increasing habitat diversity, through the installation of pilings.

Runway 22R

Table 5.2-3 illustrates how impacts to Land Containing Shellfish were avoided and minimized through the Runway 22R alternatives screening.



Table 5.2-3 Runway 22R ISA Land Containing Shellfish Minimization

Preliminary Alternative ¹	Impacts to Land Containing Shellfish (sq.ft.)
Alternative 1A and 2A with 50-Knot Arrestment Speed	72,414
Alternative 1B and 2B with 60-Knot Arrestment Speed	158,394
Alternative 1C and 2C with 70-Knot Arrestment Speed	227,567
Inclined Safety Area	62,370

¹ Alternative 1 and 2 evaluated solid fill structures and pile-supported decks for incremental EMAS arrestment speeds. The values shown in the table correspond to the impact of a solid fill structure.

In the alternatives analysis, Massport considered the use of a solid fill structure and a pile-supported structure to achieve the level of safety required by the FAA. The solid fill structure would require approximately 272,760 square feet to be covered in fill to support the new safety area, of which approximately 250,580 square feet of fill would be in Boston Harbor, therefore this Alternative was dismissed.

The Proposed Action further reduces the impacts to Land Containing Shellfish. The footprint of the proposed ISA does not extend into Boston Harbor. It only extends to the mean lower low water line; a footprint that is significantly less than the other alternatives considered. It does not require the construction of a structure in the water. It also does not require the installation of ladders or emergency access ramps as the gradual slope of the inclined safety area can be accessed by first responders.

5.2.3.3 Compensatory Mitigation

The proposed Project will unavoidably alter Land Containing Shellfish (the overlay of the Coastal Beach and Land Under the Ocean), primarily at the Runway 22R ISA. Land Containing Shellfish at Logan and other Boston Harbor locations has been mapped by the DMF as a conditionally restricted designated shellfish growing area. The densities of soft-shell clams are very low and concentrated in the eastern portion of the ISA and only two market size individuals (minimum size 2 inches) were observed in a survey, as described in Chapter 3, *Affected Environment*. Approximately 62,370 square feet of Land Containing Shellfish mapped by the DMF as conditionally restricted designated shellfish growing area, and includes all of the Salt Marsh, Coastal Beach/Tidal Flat, and Land Under the Ocean that would be affected to construct the proposed Runway 22R ISA.

Shellfish habitat would still be available after construction of the proposed Runway 33L RSA improvements. Installing pilings would result in the minor loss of natural substrate, and scour could alter the relief elevation and the distribution of the sediment grain size. The pilings, by providing additional habitat for sessile benthic organisms, could increase habitat diversity. The direct impact resulting from the installation of the piles is expected to be less than 1,500 square feet of the existing blue mussel beds, depending on pile size and configurations. The pilings beneath the high water mark are anticipated to provide substrate for attached and mobile intertidal invertebrates including blue mussels.



Massport has committed to three measures to mitigate for impacts to Land Containing Shellfish. Massport intends to continue consultation with the shellfishing community concerning these mitigation measures, during the comment period on the Final EA/EIR.

Monitoring

Massport anticipates that the construction of the Runway 33L pile-supported deck will enhance habitat used by blue mussels and other bivalves by reducing exposure to sunlight (desiccation) and by providing new substrate area (pilings). In lieu of providing compensatory mitigation for the direct loss (1,500 square feet) of blue mussel beds, Massport will undertake a monitoring program and will provide compensatory mitigation only if the monitoring program demonstrates that the pile-supported deck does not enhance habitat. The mitigation program will be finalized in consultation with DMF, and will consist of:

- Annual monitoring of benthic organism colonization of the new pilings. The density and abundance of benthic organisms (mollusks, sponges, tunicates, algae, anemones, etc.) on pilings along a transect beneath the deck will be recorded within marked permanent plots. Each plot will be photographed.
- Annual monitoring of blue mussel beds on the intertidal flats. The density and distribution of blue mussels will be recorded along three permanent transects, within 0.25-m square quadrants.
- Monitoring will be conducted at Year 1, Year 2, Year 3, Year 5, Year 7, and Year 10 following construction and annual reports provided to DMF.
- Invasive tunicates (*Didemnum vexillum*) will be identified and appropriate control measures (mechanical methods, suction, artificial UV treatment) will be investigated.

Habitat Restoration

As described in Section 5.2.1, Massport will configure the salt marsh restoration area to provide 1.1 acres of intertidal flats suitable for soft-shell clams. This will provide compensatory mitigation for the loss of the physical resource at Runway 22R.

Harvesting and Transplanting

Prior to any work at the Runway 22R ISA, Massport will coordinate with the DMF and badged shellfishers (through the Master Digger) and allow DMF to remove all harvestable-size soft-shell clams within the area of the ISA. All small clams may also be removed at the discretion of DMF and transplanted to a suitable location to augment existing soft-shell clam resources.

Resource Enhancement

Massport will provide a net benefit to the local population of shellfish by contributing funding to the DMF Boston Harbor Soft Shell Clam stock enhancement program, consistent with the FAA and USDA Wildlife Hazard Avoidance Guidelines. Massport will execute a Memorandum of Agreement with DMF similar to the MOA (July 7, 2007) for the Runway 22L ISA project.



5.2.3.4 Cost

Mitigation costs to restore/replace shellfish habitat for the Runway 33L RSA and Runway 22R ISA improvements are currently being determined in coordination with the DMF.

5.3 Construction-Period Mitigation Measures

The MEPA Certificate included specific requirements regarding construction-period mitigation to be addressed in the Final EA/EIR. These requirements include:

- Address potential temporary construction-period increases in sedimentation and turbidity;
- Implement a turbidity monitoring program during construction;
- Consider measures to reduce impacts to fish from pile-driving.

This section addresses the requirements of the Certificate and includes a description of proposed construction methods to minimize impacts to resources.

5.3.1 Eelgrass Habitat

Potential construction impacts associated with the Runway 33L RSA improvements include damage to the eelgrass bed outside of the deck footprint due to barge activity. Massport will include specifications in the construction contract that minimize this potential damage, including restricting barge movements to designated construction corridors (marked by buoys) that avoid travel over the eelbed, and restricting barge anchoring to the deck footprint to the extent practicable.

5.3.2 Fish

In response to a comment requesting consideration of some form of “fish warning” system to minimize direct construction impacts from pile driving, Massport reviewed information on the recent Boston Harbor Dredging Project. The dredging project used a fisheries warning system when channel rock blasting was required. A sonar system was used to “scare” fish out of the blasting area to minimize harm to the fish. For the RSA project, no blasting is required and the initial impact from pile driving is expected to have the same effect in scattering fish as the fish warning system and therefore no such system is proposed at this time for the RSA project.

5.3.3 Water Quality

Potential construction impacts associated with the construction of the proposed RSA improvements include increased sediment within the water column during installation or removal of sub-surface features, erosion of sediments from disturbed soils within the airfield, and the accidental release of construction materials or construction by-products. The proposed Runway 33L and the Runway 22R safety improvements are both subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (disturbance of less than 1 acre) and will comply with all requirements, as described in Chapter 6, *Regulatory Compliance*.



5.3.3.1 Runway 33L

The majority of the proposed Runway 33L RSA improvements will be constructed from barges and other water-based craft. The use of this equipment will limit the amount of disturbance to the areas immediately affected by the insertion of driven piles or installation of caissons for the pile-supported deck, the insertion of driven piles for the localizer deck, and additional piles for Category III Instrument Landing System (Cat III ILS) and a High-intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2).

The spuds that barges deploy while operating (devices similar to legs lowered into the waterway floor to anchor the structure) may disturb benthic sediments in the water column and temporarily increase turbidity in the vicinity of operations. Installation and subsequent removal of the temporary piles used to hold templates for pile-driving operations similarly may release sediments (Pile/Deck Options 1, 2, and 3). Auguring caissons may release a percentage of the excavated sediments and a percentage of the drilling mud used during the drilling process (Pile/Deck Options 5 and 6). Prior to construction of the RSA deck, a portion of the existing light pier must be removed and a temporary lighting system installed. These activities may result in additional sediment disturbance during the removal of the existing timber deck and piles. Construction of the pile caps and installation of the deck may result in accidental releases of concrete or grout into the water, runoff of concrete curing water, and instances of debris being dropped in the water (all construction options). The following measures would be deployed throughout the construction phase in order to prevent pollution from construction equipment or material:

- Installing protective measures, such as silt curtains/semi-permanent (overnight) debris booms, particularly around pile bents, secondary boom use around the excavation barge for additional containment, and silt fencing to prevent sediment from impacting water quality;
- Prohibiting any silt-producing work (pile-driving, excavation) will occur between February 1 and July 1, to avoid impacts to fish;
- Collecting and pumping slurry and/or silty water to a containment area on the barge and the placement of sediment on sheets of plastic film to contain runoff;
- Monitoring turbidity outside of the silt curtains/booms daily during silt-producing activities; and
- Managing contaminated materials encountered during construction according to the Massachusetts Contingency Plan (310 CMR 40.00) and Massachusetts General Law Chapter 21E; Oil and Hazardous Materials Release Prevention and Response Act.

The materials that will be used to build the RSA, perimeter road, and Taxiway C1 connector improvements include cement concrete, bituminous concrete, and steel. These materials would not impact water quality.

The following erosion and sedimentation controls would be used during the upland earthwork and construction phases of the Runway 33L RSA improvements. Proposed controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with USEPA NPDES regulations and with Massport's contractor requirements.



Perimeter Barriers

Perimeter barriers consisting of hay bales and silt fencing, or compost-filled “silt sock” barriers, will be placed around upland work areas to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Hay bale barriers will be backed up with silt fencing. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and hay bale barrier will be replaced as determined by periodic field inspections.

Catch Basin Protection

Existing catch basins will be protected with hay bale barriers (where appropriate) or silt sacks throughout construction.

Slope Stabilization

Stabilization of open soil surfaces will be implemented within 14 days after grading or construction activities have temporarily or permanently ceased.

Maintenance

The contractor or subcontractor will be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan. In accordance with USEPA regulations, the contractor must sign a copy of a certification to verify that a plan has been prepared and that permit regulations are understood. The on-site contractor will inspect all sediment and erosion control structures periodically and after each rainfall event. Records of the inspections will be prepared and maintained on-site by the contractor. The contractor will make the following adjustments, as necessary:

- Silt shall be removed from behind barriers if greater than 6 inches deep or as needed;
- Damaged or deteriorated items will be repaired immediately after identification;
- The underside of hay bales should be kept in close contact with the earth and reset as necessary;
- Sediment that is collected in structures shall be disposed of properly and covered if stored on-site; and
- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized, disturbed areas shall be regraded and stabilized as necessary.

To reduce the potential for any impact to water quality during dredging or excavation, the soils to be excavated and placed will both be pre-characterized through soil sampling. Soil sampling will be completed to pre-characterize the material that will be dredged or excavated in order for Massport to understand the soil make-up. Massport has identified three licensed disposal facilities where the materials can be taken based on the pre-characterization. Material would be dredged or excavated from the shoreline and placed directly in trucks that would take the materials to one of the disposal facilities. There would be no storage of materials onsite. If the pre-characterization shows that additional preventative measures need to be taken to minimize any potential for a pollution release during construction or excavation or for pollutants reentering the water column, those measures will be in accordance with the NPDES permit process under the CWA, the Resource



Conservation and Recovery Act (RCRA), Occupational Safety and Health Administration (OSHA) regulations, and the Massachusetts Contingency Plan (MCP).

5.3.3.2 Runway 22R

Water quality in the vicinity of the proposed Runway 22R enhancement could be temporarily affected by short-term construction activities, particularly due to the excavation and dredging required to remove unsuitable substrate materials and to place new stone fill. The work will consist of the excavation and removal of soft organic soils in the intertidal and coastal bank areas and replacement with crushed stone/granular soil to provide a stable base for the slope. These activities may result in a temporary increase in suspended sediments and increased turbidity in the immediate vicinity of the proposed work. Any turbidity created would be quickly dispersed by the tides; therefore, the effects from temporary construction-related turbidity are negligible.

The first step in the construction sequence would be to protect the perimeter of the inclined safety area by placing gabions (partitioned, wire fabric containers filled with stone to form flexible, permeable structures for earth retention). The gabions would be wrapped with filter fabric during construction to also act as a barrier to sediment releases and reduce resulting turbidity. The majority of the excavation would occur in the intertidal areas to remove soft organic soils and replace them with crushed stone/granular soil to provide a stable base for the slope. The following specific mitigation measures will be used:

- Excavation within the intertidal zone would be completed during periods of low tide;
- Surrounding the work area with a siltation curtain/ debris boom to contain and minimize any debris or siltation;
- Prohibiting any silt-producing work (pile-driving, excavation) between February 1 and July 1, to avoid impacts to fish;
- Monitoring turbidity outside of the silt curtains/booms daily during silt-producing activities; and
- Construction completed at the Runway 22R end would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts.

5.3.4 Surface Transportation

Runway 33L RSA improvements will be constructed primarily from the water, which reduces the number of construction vehicles accessing the airport and surrounding roadways. In addition, Runway 33L and Runway 22R are not likely to be under construction simultaneously, which limits the amount of concurrent construction vehicle access, as described in the Draft EA/EIR. Logan Airport roadways can support the anticipated construction-related traffic, therefore, no 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 via only state and federal highways and the Airport roadway network prohibiting construction-related traffic on the local East Boston roadways. Massport also requires contractors to implement a construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan Transportation Management Association (TMA).



5.3.5 Noise

Sound levels from activities associated with the construction of the proposed Runway 33L or Runway 22R RSA improvements comply with the City of Boston's noise criteria, therefore no noise mitigation is required as documented in the Draft EA/EIR. However, construction equipment would use noise-reduction measures as listed in Table 5.4-2.

5.3.6 Air Quality

The proposed safety improvements will not change the operational levels at Logan Airport nor alter ground-based aircraft movements (i.e., aircraft taxi and delay periods). Therefore, operational emissions will not change due to this project. However, the 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 transport vessels; evaporative emissions from asphalt placement and curing; and the generation of fugitive dust from disturbance of unpaved areas, as described in the Draft EA/EIR. The project would not exceed *de minimis* thresholds under the Clean Air Act and would not impact air quality. As part of its project approvals process, Massport requires all contractors to adhere to certain construction guidelines that relate to:

- Construction vehicle/equipment anti-idling;
- Retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters; and
- Construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan TMA.

5.4 Proposed Section 61 Findings

Massachusetts General Law Chapter 30, Section 61, requires 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 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 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.

5.4.1 Project Description

The proposed RSA Improvements Project includes two separate elements: Runway Safety Area (RSA) improvements at the Runway 33L end, consisting primarily of a larger EMAS bed on a pile-supported structure;



and an Inclined Safety Area (ISA) at the Runway 22R end, similar to the previously-permitted Runway 22L RSA enhancements.

5.4.1.1 Runway 33L

The Proposed Action for Runway 33L (Preliminary Alternative 4) is construction of a 600-foot long RSA with EMAS, partially located on a 470-foot long by 303-foot wide pile-supported deck (Figure 2-3). The Proposed Action also includes moving the existing offset localizer to the maneuvering section of deck at the end of the RSA, and upgrading the approach light system to a Cat III ILS and ALSF-2. Part of the existing timber light pier (approximately 500 feet) would be removed and the approach lights would be incorporated into the new deck.

While the Runway 33L Proposed Action would result in impacts to environmental resources, it would minimize unavoidable impacts to the all environmental resources including Coastal Bank, Coastal Beach, Land Under the Ocean, and Submerged Aquatic Vegetation (eelgrass). This alternative would also maintain runway utility and capacity, and would provide protection and functionality near equivalent to a RSA that fully meets the design criteria.¹¹ This is the only alternative that the MEPA Certificate required be carried forward in the Final EIR. Massport and FAA retained this alternative on the basis that it was the alternative proposed by the FAA in its determination based on environmental impacts and cost.

The Proposed Action for Runway 33L would extend the length of the existing RSA from 187.5 feet to 600 feet. The new pile-supported section of the RSA would have a width of 300 feet within the 303-foot wide deck. While the RSA would not fully comply with the current design criteria in the FAA's Airport Design Advisory Circular for RSAs¹² in terms of width, the FAA determined that the risk of an undershoot occurring outside of the 300-foot width is reduced by centerline guidance of the existing CAT II ILS and MALSR visual aid on the runway.¹³ The FAA strongly rejected consideration of any length of less than 600 feet "since the marginal costs and environmental impacts were not judged significant enough to offset the compromises in RSA function"¹⁴

The environmental consequences of five piling construction options were evaluated in Chapter 4, *Environmental Consequences*. The deck would be the same size (approximately 303 feet wide and 470 feet long) for each option, but with different sizes, numbers and arrangements of supporting pilings. Five construction options are described detail in Chapter 2, *Alternatives*. The five construction options are retained by Massport in order to maintain flexibility in the design/build process being undertaken for the Runway 33L safety improvements. These options would have the same deck dimensions and therefore the same impacts to eelgrass, and have only minimal differences in the direct impacts of the pilings, which would range from 460 square feet to 1,175 square feet. The preferred alternative will be identified once the design/build contractor has been selected, and is likely to be a modification of one of these five construction options. Consistent with the requirement of the Secretary's

11 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 6.

12 United States Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15, December 31, 2009.

13 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 6.

14 Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 5.



Certificate on the Draft EA/EIR, Massport will continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree possible.

5.4.1.2 Runway 22R

The Runway 22R Alternative 4 - ISA would enhance the existing RSA by constructing an inclined safety area at the end of Runway 22R. This alternative was advanced to the conceptual design phase because it would enhance the existing RSA and rescue access in the event of an emergency, at a construction cost which appears to be feasible.

The ISA would not increase the arrestment speed of the existing 60 psi strength EMAS bed, which meets the current minimum FAA Design Standards for overrun protection for the design aircraft (Boeing 757-200), but would provide a smoother transition into the water for any aircraft that exits the runway at a speed greater than 40 knots. There is a substantial elevation change and slope gradient from the end of the existing EMAS bed down to the mean low water elevation. An ISA would re-grade this area to provide a more constant slope in the event that the aircraft exited the EMAS bed and entered the water, and would reduce the potential for loss of life and damage to any aircraft that fails to stop within the existing EMAS bed. It would also significantly enhance access by rescue personnel as well as egress by passengers.

The proposed ISA would be similar to the ISA successfully constructed at the Runway 22L end. It would require gravel fill to be placed approximately 130 feet north from the top of the coastal bank and would be graded over the full width of the extended safety area down to the mean lower low water elevation.¹⁵ Emergency access ramps would not be required because the ISA would provide first responders with access between the water and the airfield. The perimeter road would not be relocated. Figure 2-8 depicts the Proposed Action.

5.4.2 History of MEPA Review

In June 2009, Massport submitted an Environmental Notification Form (ENF) to the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA Number 14442), in accordance with the Massachusetts Environmental Policy Act and accompanying regulations (301 CMR 11). The ENF described the purpose of the project, which is to increase safety for aircraft and their passengers in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's orders and regulations.¹⁶

The project Environmental Notification Form (ENF) was circulated to interested parties and a Public Notice of Environmental Review was published on July 8, 2009, in accordance with MEPA regulations 301 CMR 11.05 and 301 CMR 11.15. A public scoping meeting was held on July 30, 2009, to solicit public input on development of the Draft EA/EIR scope.

The Secretary issued a Certificate on the ENF on August 14, 2009, confirming the need to prepare an Environmental Impact Report (EIR). The Certificate approved coordinated submission of required

¹⁵ Mean Lower Low Water (MLLW) = the average daily lower low water level of the tide at a location. Some locations have diurnal tides--one high tide and one low tide per day. At most locations, there are semidiurnal tides--the tide cycles through a high and low twice each day, with one of the two high tides being higher than the other and one of the two low tides being lower than the other.

¹⁶ Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.



documentation under NEPA. The Secretary stated that “the planning for this project would be best served by a coordinated review and the submission of a single set of documents to satisfy the requirements of both MEPA (Section 11.09(4)(c)) and NEPA.”

The Draft EA/EIR was circulated to interested parties and a Public Notice of Environmental Review was published on July 21, 2010, in accordance with MEPA regulations 301 CMR 11.05 and 301 CMR 11.15. The Secretary issued a Certificate on the Draft EA/EIR on September 29, 2010. The Certificate determined that the Draft EA/EIR “adequately and properly complies with the Massachusetts Environmental Policy Act and its implementing regulations”, and provided a Scope outlining the remaining issues to be addressed in the Final EA/EIR.

5.4.3 Related Permits and Approvals

In addition to compliance with the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act (MEPA), a number of local, state, and federal permits are needed for the proposed Project, as listed in Table 5.4-1. Permitting for both the Runway 33L and Runway 22R RSA improvements would be similar since generally the same resources would be affected. The Runway 33L and Runway 22R RSA improvements could be permitted separately since each is a single and complete project that would be constructed independently of the other and possibly at different times. However, because of the similar elements of both projects, Massport has initiated MA WPA review as a single project. A Notice of Intent (NOI) was submitted to the Boston Conservation Commission (BCC) on January 20, 2010 to initiate the MA WPA Variance process. Consistent with the MA WPA regulations, the BCC was required to deny the proposed Project in their Order of Conditions (OOC). The BCC procedural denial was then followed by Massport’s request to the DEP Northeast Regional Office for a Superseding OOC. On March 18, 2010, DEP denied the proposed Project in its Superseding Order, consistent with the MA WPA regulations. Massport submitted its request for a Variance to the DEP Commissioner on March 31, 2010. Chapter 4, *Environmental Consequences*, provides additional project details relative to the project impacts. On June 22, 2010 DEP provided a letter identifying specific additional information required for the Variance application (see Appendix 4, *Agency Correspondence*).

Table 5.4-1 Required Permits and Approvals

Issuing Agency	Approval or Permit
U.S. Army Corps of Engineers	Clean Water Act, Section 404 and Section 10 Individual Permit
U.S. Environmental Protection Agency Region I	National Pollutant Discharge Elimination System, Construction General Permit
Massachusetts Office of Coastal Zone Management	Coastal Zone Management, Federal Consistency Determination
Massachusetts Executive Office of Energy and Environmental Affairs	Public Benefits Determination
Massachusetts Department of Environmental Protection	Massachusetts Wetlands Protection Act Variance Massachusetts Public Waterfront Act Approval (Chapter 91) Clean Water Act, Section 401 Water Quality Certificate Section 61 Finding



5.4.4 Overview of Project Impacts and Mitigation Measures

The proposed RSA Improvements Project will result in impacts to Coastal Bank, Coastal Beach, Land Under the Ocean, Salt Marsh, Land Containing Shellfish, and Submerged Aquatic Vegetation (eelgrass). Massport has proposed compensation for impacts to wetland resources: salt marsh, submerged aquatic vegetation, and land containing shellfish. In the alternative, Massport has also committed to providing out-of-kind mitigation that would enhance research and mapping efforts of state and federal resource agencies, as discussed in previous sections. Temporary impacts to environmental resources would also be mitigated through contractor equipment specifications, as well as soil and erosion controls to prevent adverse water quality impacts.

5.4.4.1 Permanent Impacts

Permanent impacts resulting from construction of the RSA Improvements Project would be mitigated, as described in Section 5.2 and summarized in Table 5.4-2. There would be no impacts to ground transportation, air quality, socio-economic impacts, environmental justice, children's health and safety risks, historic resources, Section 4(f) resources, coastal resources, wild and scenic rivers, farmland, natural resources, light emissions, and energy supply. Therefore, mitigation is not required for these resources.

5.4.4.2 Construction Impacts

Temporary, short-term impacts from construction activities would be mitigated to the extent practicable (see Table 5.4-2). 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 150/5370-10 (latest edition), Standards for Specifying Construction of Airports*.¹⁷ 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 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.

¹⁷ Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports.



Table 5.4-2 Proposed Massport Project Mitigation Commitments

Environmental Categories	Runway End	Mitigation Measure	Approximate Cost	Implementation Schedule
Eelgrass	33L	A mitigation program that will replace lost eelgrass area and function by creation of new eelgrass, at a 3:1 replacement loss ratio.	\$600,000 to \$1.2 million	Initiate Prior to Construction
		Implement sedimentation control measures.	TBD	During Construction
		Store barges overnight storage outside of any eelgrass beds.		
		Restrict barge movement to designated construction corridors outside of the eelgrass bed.	TBD	During Construction
		Post-construction monitoring and restoration of any additional areas of eelgrass beds that are inadvertently damaged.	\$125,000	
Land Containing Shellfish	Both	Monitor pilings and substrate at Runway 33L	TBD	10-year period following construction
		Restore approximately 1.1 acres of habitat	TBD	During Construction
		Harvest and transplant shellfish from footprint of Runway 22R ISA	TBD	Prior to Construction
		Execute Memorandum of Agreement with DMF for resource enhancement	TBD	Prior to Construction
Water Quality		Develop and implement a comprehensive Soil Erosion and Sediment Control Plan in accordance with NPDES and DEP standards.	TBD	During Construction
		Apply water to dry soil to prevent dust production.	TBD	During Construction
		Stabilize any highly erosive soils with erosion control blankets and other stabilization methods, as necessary.	TBD	During Construction
		Use sediment control methods (such as silt fences and hay bales), during excavation to prevent silt and sediment entering the stormwater system and waterways.	TBD	During Construction
		Maintain equipment to prevent oil and fuel leaks.	TBD	During Construction
		Silt curtains/semi-permanent (overnight) debris booms and secondary boom use around the excavation barge for additional containment, and silt fencing.	TBD	During Construction
		Collect and pump of slurry and/or silty water to a containment area on the barge and the placement of sediment on sheets of plastic film to contain runoff.	TBD	During Construction



Table 5.4-2 Proposed Massport Project Mitigation Commitments (continued)

Environmental Categories	Runway End	Mitigation Measure	Approximate Cost	Implementation Schedule
Salt Marsh	22R	Restore/create new salt marsh at a 2:1 replacement/loss ratio.	\$600,000 to \$1.1 million	During Construction
		Monitor compensatory Salt Marsh for success and invasive plant species, and implement an invasive species control plan.	\$125,000 (\$25,000 per year)	5-year period following construction
		Implement erosion and sedimentation control measures according to the Soil Erosion and Sediment Control Plan.	TBD	During Construction
Noise	Both	Maintain mufflers on construction equipment.	TBD	During Construction
		Keep truck idling to a minimum in accordance with MA anti-idling regulations.	TBD	During Construction
		Fit any air-powered equipment with pneumatic exhaust silencers.	TBD	During Construction
		Do not allow nighttime construction.	TBD	During Construction
Traffic	Both	Limit construction traffic to federal or state highways, restricting use of East Boston local roadways by construction vehicles.	TBD	During Construction
		Implement construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan TMA.	TBD	During Construction
Air Quality	Both	Keep truck idling to a minimum in accordance with MA anti-idling regulations.	TBD	During Construction
		Retrofit appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters.	TBD	During Construction
		Implement construction worker vehicle trip management, including requiring contractors to provide off-airport parking, use high-occupancy vehicle transportation modes for employees, and join the Logan TMA.	TBD	During Construction
Cultural Resources	Both	Develop an Unanticipated Discovery Plan in accordance with the Board of Underwater Archaeological Resources' Policy Guidance.	TBD	Prior to Construction
State-Listed Rare Species	Taxiway C1	Identify equivalent area of pavement for removal to maintain area of available habitat (if required by NHESP)	TBD	Prior to construction of Taxiway C1
Hazardous Materials and Solid Waste	Both	Pre-characterize any materials that would be dredged or excavated from the Project areas to determine course of action for removal.	TBD	During Construction

TBD: To be Determined



5.4.5 Proposed Section 61 Findings

Proposed Section 61 Findings for the Project have been prepared to assist state agencies and authorities with their responsibility to comply with the requirements of Massachusetts General Laws, Chapter 30, Section 61, and MEPA regulations at 301 CMR 11.07(6)(k). Under these provisions, state agencies and authorities are required to review, evaluate, and determine the impacts on the natural environment of all projects or activities requiring state action. State agencies and authorities are also required to identify all feasible measures to avoid or minimize environmental impacts. In connection with the RSA Improvements Project, Massport, as the project proponent, will be required to provide Section 61 Findings. In addition, DEP will be required to provide Section 61 Findings in connection with the issuance of the following permits:

- Section 401 Water Quality Certification;
- Wetlands Protection Act Variance; and
- Massachusetts Public Waterfront Act License.

The language in the following paragraphs is a proposed Section 61 Finding that extends to cover all potential impacts of the project.

Project Name: Boston-Logan International Airport Runway Safety Area
Improvements Project
Project Location: Boston-Logan International Airport, East Boston,
Massachusetts
Project Proponent: Massachusetts Port Authority
EOEEA Number: 14442

The potential environmental impacts of the project have been characterized and quantified in the Final EA/EIR, which are incorporated by reference into this Section 61 Finding. Throughout the planning and environmental review process, Massport has been working to develop measures to mitigate significant impacts of the proposed safety improvements. With the mitigation proposed and carried out in cooperation with state agencies, [Agency] finds that there are no significant unmitigated impacts.

Massport has prepared a Table of Mitigation (Table 5.4-2 of the Final EA/EIR) that specify, for both temporary and permanent impact, the mitigation that Massport will provide.

Therefore, [Agency] having reviewed the MEPA filings for the Boston-Logan International Airport Runway Safety Area Improvements Project, including the mitigation measures summarized in Chapter 5 of the Final EA/EIR, finds pursuant to M.G.L. C. 30, §61 that, with the implementation of these mitigation measures, all practicable and feasible means and measures will have been taken to avoid or minimize potential damage from the project to the environment. In making this finding, [Agency] has considered reasonably foreseeable climate change impacts, including additional greenhouse gas emissions, and effects, such as predicted sea level rise.



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6

Regulatory Compliance

6.1 Introduction

In addition to complying with the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act (MEPA), a number of state and federal permits are needed for the proposed Runway Safety Area (RSA) Improvements Project. Table 6.1-1 lists required state and federal permits and the current status of the permits and other approvals. All listed agencies also participate in the review of the project through the NEPA and/or MEPA process. Permitting for both the Runway 33L RSA and Runway 22R ISA improvements, individually, would be similar since generally similar resources would be affected. The proposed Runway 33L and Runway 22R RSA improvements could be permitted separately, since each is a single and complete project that would be constructed independently of the other and possibly at different times. However, Massport has initiated all permit and approval review as a single project for both Runway 33L and Runway 22R RSA improvements, primarily to address cumulative effects and for environmental review efficiency.

The five piling construction options presented in this Final EA/EIR are retained by Massport to maintain flexibility in the design/build process being undertaken for the Runway 33L safety improvements. These options would have the same deck dimensions and therefore the same impacts to eelgrass, and have only minimal differences in the direct impacts of the pilings, which would range from 460 square feet to 1,175 square feet. The final piling design will be confirmed once the design/build contractor has been selected, and is likely to be a refinement of one of these five construction options that minimizes impacts while retaining project feasibility, functionality and constructability. A draft Chapter 91 application, submitted to DEP on January 20, 2011 to facilitate agency review, provides plans for one option (a modification of Option 2), which represents a balance of impacts, feasibility, functionality, and constructability based on currently available engineering assessments. Consistent with the requirement of the Secretary's Certificate on the Draft EA/EIR, Massport will continue to identify methods to refine the preferred alternative further to minimize adverse impacts to the maximum degree feasible.



Table 6.1-1 Required Permits and Approvals

Issuing Agency	Approval or Permit	Status
U.S. Army Corps of Engineers	Clean Water Act, Section 404 and Section 10 Individual Permit	Submitted January 2011
U.S. Environmental Protection Agency Region I	National Pollutant Discharge Elimination System Construction General Permit	Not yet applied for – SWPPP will be developed by Contractor
Massachusetts Office of Coastal Zone Management	Coastal Zone Management, Federal Consistency Determination	Not yet applied for – requires Final MEPA Certificate
Massachusetts Executive Office of Energy and Environmental Affairs	Public Benefits Determination	See Chapter 5
Massachusetts Department of Environmental Protection	Massachusetts Wetlands Protection Act Variance	Variance Request Submitted March 2010
	Massachusetts Public Waterfront Act Variance/Approval (Chapter 91)	Submitted January 2011
	Clean Water Act Section 401 Water Quality Certificate	Submitted January 2011
	Section 61 Finding	Draft Section 61 Finding provided in Chapter 5

The Secretary’s Certificate on the Draft Environmental Assessment/Environmental Impact Report (EA/EIR) stated that the Final EA/EIR must:

- Address criteria for issuance of a Massachusetts Wetlands Protection Act (MA WPA) variance (301 CMR 10.05(10));
- Address how the Project will meet the standards for a Massachusetts General Law, Chapter 91 license;
- Document how the Project complies with requirements for the Public Benefits Determination (301 CMR 13.00); and
- Demonstrate how the proposed stormwater management system is designed in compliance with the Stormwater Management Standards stated in the MA WPA (310 CMR 10.05(6)(b)(1)(a)) and the Massachusetts Water Quality Certification Regulations (314 CMR 9.06(1)(a)).

The following sections describe the required permits and approvals for the RSA Improvements Project.



6.2 Department of the Army Permit (Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act)

The United States Army Corps of Engineers (USACE):

- Determined the Basic Project Purpose (BPP) of the Runway Safety Area Improvements Project: “to increase safety for aircraft and their passengers in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA’s orders and regulations;”¹
- Concurred with the range of alternatives explored for the proposed Project’s alternatives analysis; and,
- Agreed on the procedures for evaluating and screening alternatives.

Section 404 of the Clean Water Act (CWA) regulates the placement of dredged or fill material into “Waters of the United States,” which include vegetated wetlands and land under a water body. Section 10 of the Rivers and Harbors Act (33 U.S.C. 401) requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States, the excavation/ dredging or deposition of material in these waters, or any obstruction or alteration in a navigable water. The proposed RSA Improvements Project would require a permit authorized under Section 404 of the CWA for the placement of fill in coastal wetlands because it would result in new fill in navigable waters of the U.S. and new pile-supported structures within vegetated shallows (permanently inundated areas that support communities of rooted aquatic vegetation such as eelgrass). It will also require permit coverage authorized under Section 10 of the Rivers and Harbors Act for construction of the pile-supported deck into navigable waters off Runway 33L and excavation within tidal waters up to highest high water for the Inclined Safety Area (ISA) at the Runway 22R end. The RSA Improvements Project does not meet the thresholds for coverage under the Massachusetts General Permit for these activities in waters of the US; therefore, an Individual Department of the Army Permit will be sought. Permits for activities regulated under both Acts are processed simultaneously by USACE. Massport filed the Section 404/Section 10 permit application with the USACE in January 2011.

The regulations regarding the issuance of permits for the placement of dredged or placement of fill into waters of the U.S. (33 CFR Part 323)² include procedures to be followed by the USACE regarding the review of applications for Department of the Army Permits. The evaluation of whether to issue a permit is based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on public interests. This evaluation includes application of the U.S. Environmental Protection Agency’s (USEPA) *Section 404 (b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material* (40 CFR Part 230).³ Wetlands and vegetated shallows (eelgrass beds) are included in the Section 404 definition of special aquatic sites (SAS):

“Geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as

1 Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.

2 33 CFR Part 323, *Permits for Discharges of Dredged or Fill Material into Waters of the United States*, <http://www.usace.army.mil/CECW/Documents/cecwo/reg/33cfr323.pdf>.

3 40 CFR Part 230, Subpart B § 230.10, *Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material*.



significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region."

The Section 404(b)(1) Guidelines provide specific information regarding the avoidance of impacts from the placement of dredged or fill material to SAS. The Guidelines state that "all practicable alternatives to the proposed discharge [of dredged or fill material], which do not involve a discharge into a special aquatic site, are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise." The alternatives analysis, described in Chapter 2, *Alternatives*, demonstrates that other feasible alternatives do not have less impact on the aquatic ecosystem, rather, that the proposed RSA improvements would have the least adverse impact. The Section 404(b)(1) guidelines also provide guidance to the USACE regarding the avoidance of unnecessary filling in wetlands. There are four criteria provided for compliance evaluation. These criteria and the proposed RSA Improvements Project's compliance with them are summarized below.

- *"There must be no practicable alternatives available which would have less adverse impact on the aquatic ecosystem and which do not have other significant adverse environmental consequences."* Chapter 2, *Alternatives*, demonstrates that there are no alternatives that would allow Massport to comply with Federal Aviation Administration (FAA) safety standards that would not alter wetlands subject to jurisdiction under Section 404. The No-Action/No-Build Alternative does not fulfill the project's purpose: to increase safety for aircraft and passengers in emergency situations, by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's orders and regulations.⁴
- *"The activity must not violate federal or state water quality standards or threaten a federally-listed threatened or endangered species."* The proposed RSA improvements would not violate state water quality standards and would have no adverse effects to federally listed threatened or endangered species, as documented in Chapter 4, *Environmental Consequences*. The RSA Improvements Project would include Best Management Practices (BMPs) as part of a proposed stormwater management plan.
- *"There must not be significant degradation of waters and wetlands."* Although the proposed RSA improvements would have unavoidable impacts on wetlands, these impacts would be mitigated, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Coordination with federal and state review agencies including USEPA, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the Massachusetts Department of Environmental Protection (DEP), regarding proposed mitigation, have occurred throughout the development of this EA/EIR and will continue through final permitting.
- *"All reasonable steps must be taken to minimize adverse effects to the aquatic environment."* The 1990 Memorandum of Agreement between the USEPA and the Department of the Army⁵ established policy and procedures for evaluating potential significant degradation and established standards for avoidance and minimization of adverse effects before consideration of mitigation. Massport has altered the proposed design of both the Runway 22R ISA and the Runway 33L RSA to avoid and minimize impacts to wetland resources, as described in Chapter 2, *Alternatives*, and Chapter 5, *Proposed Mitigation and Section 61 Findings*.

⁴ Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.

⁵ Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency: *The Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines*, February 6, 1990.



Massport has continued to work within the FAA's latest guidelines to develop an alternative that would meet the needs of users, minimize potential environmental impacts, and be practicable from safety, operational, and cost perspectives.

6.3 National Pollutant Discharge Elimination System Permit

As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. Point sources are discrete conveyances such as pipes or man-made ditches. The NPDES program includes permitting for municipal, industrial, and construction-related sources of pollution under general or individual permits. The proposed RSA improvements for Runway 33L and Runway 22R must meet the standards included in Logan Airport's individual NPDES permit (No. MA0000787), which allows Massport to discharge stormwater from all outfalls on the airport property.

The proposed pile-supported deck for the Runway 33L improvements would include scuppers that discharge stormwater off the deck and into Boston Harbor. The deck will slightly increase impervious surfaces at the Runway 33L project area. In addition, alterations to the existing perimeter roadway would be necessary. There would be no increase in impervious surfaces at the Runway 22R project area. The proposed Runway 22R ISA would include a stone sloped surface that is mostly under water at high tide. These project elements would meet the standards of Logan Airport's NPDES individual permit due to proposed stormwater management BMPs.

The proposed RSA Improvements Project would also require completion and submittal of a Stormwater Notice of Intent to the USEPA for coverage under the NPDES Construction General Permit (CGP) for stormwater discharge from construction activities because the Project would disturb more than one acre of land. The CGP requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific sedimentation and erosion control measures for the entire duration of the construction activities. Standard 8 of the Massachusetts Stormwater Management Policy also requires the use of erosion and sediment controls during construction. Proper implementation of the SWPPP would ensure no negative impacts would occur from construction related stormwater management. Mitigation measures included in Logan Airport's existing SWPPP to minimize sedimentation and erosion are described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

6.4 Federal Consistency Review

The federal Coastal Zone Management Act (CZMA), gives the Massachusetts Office of Coastal Zone Management (CZM) the authority to review federal projects to ensure that they meet state standards articulated in its coastal zone management plans through a process called federal consistency review. Federal consistency review is required for most projects that are in or can reasonably be expected to affect a use or resource of the Massachusetts coastal zone and/or require certain federal licenses or permits, receive certain federal funds, or are a direct action of a federal agency. Massport will submit a complete application to the Office of Coastal Zone



Management after the Secretary's Certificate on the Final EA/EIR has been issued, in accordance with 301 CMR 21.00.

The CZMA defines "enforceable program policies" as "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 waters uses and natural resources in the coastal zone." ⁶ Proponents must demonstrate that projects subject to federal consistency review are consistent with these policies. The following sections describe the enforceable program policies and associated authorizing legislation that are applicable to the proposed RSA improvements, and explains how the RSA Improvements Project is consistent with these policies.

6.4.1 CZM Water Quality Policy 2

Ensure that nonpoint source (NPS) pollution controls promote the attainment of state surface water quality standards in the coastal zone.

CZM implements this policy through the provisions of the following statutes and regulations that are applicable to the RSA Improvements Project:

- Clean Water Act 401 Water Quality Certification;
- Massachusetts Surface Water Quality Standards (314 CMR 4.00);
- Massachusetts Wetlands Protection Act (M.G.L. c. 131, §40) and Regulations (310 CMR 10.00); and
- Massachusetts Stormwater Management Policy and Management Standards.

The proposed RSA improvements will be designed to comply with the Massachusetts Surface Water Quality Standards and Stormwater Standards. Proposed stormwater management measures within the Runway 33L project area and on the decking structure will be designed to satisfy the Stormwater Standards to the extent practicable, as described in Section 6.5.3 and Chapter 5, *Proposed Mitigation and Section 61 Findings*.

The only potential exposure to pollutants would be from an aircraft accident or infrequent access to the existing light pier for maintenance. These conditions currently exist at this location. The project would not generate additional pollutants, as there will be the same number of aircraft and ground vehicle operations under the No-Action/No-Build and Build Alternatives. Therefore, there will be no change of atmospheric deposition.

Massport currently sweeps runways and the perimeter roadway to remove sediments and pollutants from these impervious surfaces. Infrequently, snow blowers are used to remove snow from Engineered Material Arresting System (EMAS) beds, however; there will be no chemical use on the EMAS. Existing stormwater management measures regarding containment of oil spills are mandated in Logan Airport's NPDES permit.

6 Commonwealth of Massachusetts. *Coastal Zone Management/Federal Consistency Review, 301 CMR 21.00*. May 14, 1999. Appendix D.



6.4.2 CZM Habitat Policy 1

Protect coastal resource areas including salt marshes, shellfish beds, dunes, beaches, barrier beaches, salt ponds, eelgrass beds, and fresh water wetlands for critical wildlife habitat functions as well as other including nutrient and sediment attenuation, wave and storm damage protection, and landform movement and processes.

CZM implements this policy through participation in and review of the MA WPA and CWA 401 Water Quality Certification programs. CZM will review the MA WPA variance request submitted for the project in determining the Project's consistency. Coastal Beach, Coastal Bank, and Land Under Water wetlands resources have been protected through careful design of the project, as described in Section 6.5.1. Impacts to salt marsh and eelgrass beds are unavoidable, as documented in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Massport has proposed measures to mitigate for the loss of these resources, which include, among others, eelgrass restoration/ re-establishment and salt marsh restoration/creation measures. Chapter 5, *Proposed Mitigation and Section 61 Findings*, describes these mitigation measures.

6.4.3 CZM 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.

CZM implements this policy through participation in and review of the MA WPA and CWA 401 Water Quality Certification programs. CZM will review the MA WPA variance request submitted for the proposed improvements in determining the Project's consistency with this policy. Impacts are unavoidable to complete runway safety measures. Proactive mitigation measures include the restoration of salt marsh in excess of the amount that would be lost (2:1 ratio). Proposed eelgrass mitigation actions include in-kind restoration to meet a replacement ratio of 3:1. Chapter 5, *Proposed Mitigation and Section 61 Findings*, describes these mitigation measures.

6.4.4 CZM 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.

CZM implements this policy through technical assistance to project proponents and to other public agencies and review of projects proposed on coastal landforms. The proposed RSA improvements will not affect the flood control or storm damage functions of the coastal bank at either Runway end, as described in Section 6.6.2 and Chapter 4, *Environmental Consequences*.

6.4.5 CZM 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 are examined by CZM on a case by case basis for the following:

- The Project's consistency with Coastal Hazard Policy #1; and
- 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).

The construction of the proposed pile-supported deck structure at the Runway 33L end would result in minor changes to coastal processes, particularly sediment transport scour around the proposed pilings. The proposed pier and deck design seeks to minimize changes to coastal processes, as described in Chapter 4, *Environmental Consequences*, and Chapter 5, *Proposed Mitigation and Section 61 Findings*. Waves and currents would generally move unimpeded under the pile-supported deck with some reduction in speed due to the presence of the piles. There would be no adverse impact to waves or currents at the Runway 22R end, as documented in Chapter 4, *Environmental Consequences*. The proposed improvements are compliant with the Coastal Hazard Policy 2.

6.4.6 CZM 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; and*
- *Be reasonably safe from flood and erosion related damage.*

The proposed pile-supported deck at the Runway 33L end has been designed to withstand flood and erosion related damage as it would be elevated above mean high water, thereby diminishing damage from erosion.

6.5 Massachusetts Wetlands Protection Act - Order of Conditions

The Massachusetts MA WPA Regulations establish performance standards for work proposed within each of the state wetland resource areas and require review of any work proposed within 100 feet of a wetland resource to determine if that work would alter the resource area.

Construction of the proposed RSA improvements would require the Commissioner of the DEP to issue a Variance from the MA WPA Regulations. Runway 33L safety improvements would not meet the MA WPA performance standards under 310 CMR 10.25(6)(b) because the proposed Runway 33L RSA improvements would result in the loss of approximately 66,660 square feet of eelgrass (*Zostera marina*) due to direct and indirect shading. The proposed Runway 22R ISA would not meet the performance standards under 310 CMR 10.32(3) because the proposed safety improvements would eliminate approximately 35,040 square feet of Salt Marsh.

The Runway Safety Area Improvements Project is defined as a "water-dependent" project under 310 CMR 10.04, "facilities which require direct access to, or location in, marine, tidal or inland waters and therefore cannot be located away from said waters, including.... Any other uses and facilities as may further hereafter be defined as water-dependent in



310 CMR 9.00.” The DEP Waterways Regulations at 310 CMR 9.12(a)(10) identify “navigation aids, marine police and fire stations, and other facilities which promote public safety and law enforcement on the waterways” as water-dependent uses. The Runway Safety Areas, which are intended to prevent aircraft from entering Boston Harbor (the Runway 33L RSA) or to provide a safe transition for aircraft between the runway and the harbor (the Runway 22R ISA) meet this definition.

The Secretary’s Certificate on the Draft EA/EIR stated that the Final EA/EIR must:

- Address the three criteria of the MA WPA Regulations (301 CMR 10.05) regarding granting of a Variance request:
 - There are no reasonable conditions or alternatives that would allow the project to proceed in compliance with the wetlands regulations;
 - Mitigation measures are proposed that will allow the project to be conditioned so as to contribute to the protection of the interests identified in the MA WPA; and
 - The variance is necessary to accommodate an overriding community, regional, state or national public interest, or to avoid an unconstitutional taking of property without compensation; and,
- Demonstrate how the Project will be designed in compliance with the performance standards in the Massachusetts Stormwater Management regulations (310 CMR 10.00), Compliance With Regulatory Performance Standards

6.5.1 Compliance with Performance Standards

The following sections document how the proposed RSA Improvements Project has been designed to meet the applicable MA WPA performance standards for Coastal Bank, Coastal Beach, and Land Under the Ocean. A Variance from any of these performance standards not met will be requested.

6.5.1.1 Runway 33L

The proposed Runway 33L RSA improvements meet the MA WPA performance standards for the Coastal Bank and Coastal Beach resource areas.

Coastal Bank

The proposed Runway 33L RSA improvements meet the regulatory performance standards for Coastal Bank. The regulations at 310 CMR 10.30(3) through (8) establishes six general performance standards for work proposed in Coastal Bank. The Coastal Bank at this location does not supply sediment to Coastal Beaches, Coastal Dunes, or Barrier Beaches. Therefore, the performance standards identified in 310 CMR 10.30(3) through (5) are not applicable, and only the performance standards identified in 310 CMR 10.30(6) and (8) are applicable.

- 310 CMR 10.30(6) *“Any project on such a coastal bank or within 100 feet landward of the top of such coastal bank shall have no adverse effects on the stability of the coastal bank.”* The proposed project will not have any effect on the stability of the man-made Coastal Bank. The existing placed stone, the large boulder groins west of the light pier, and the large boulder rip-rap east of the light pier contribute to the stability of the Coastal Bank,



and will continue to contribute to the prevention of storm damage and flooding. The new bulkhead will continue to provide stability to the Coastal Bank.

- 310 CMR 10.30(8) *“Notwithstanding the provisions of 310 CMR 10.30(3) through (7), no project may be permitted which will have an adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.”* The Massachusetts Natural Heritage and Endangered Species Program (NHESP) indicated that, with respect to the work proposed under the MA WPA, the proposed Project would not adversely affect the actual resource area habitat for the state-protected species, but indicated that review under the Massachusetts Endangered Species Act is ongoing.⁷ The minor loss of aquatic habitat is not anticipated to affect shorebirds or waterfowl.

Coastal Beach

The work meets the regulatory performance standards for this resource area. The regulations at 310 CMR 10.27(3) through (7) establish five general performance standards for work proposed in Coastal Beach. The Coastal Beach at Runway 33L is significant to storm damage prevention, flood control, and the protection of wildlife habitat. As there are no Tidal Flats, proposed solid pier or jetty, or proposed beach nourishment off of Runway 33L, 310 CMR 10.27 (4) through (7) are not applicable. However, the standard relating to the prevention of erosion and protection of the Coastal Beach is applicable (310 CMR 10.27(3)): *Any project on a coastal beach, except any project permitted under 310 CMR 10.30(3)(a), shall not have an adverse effect by increasing erosion, decreasing the volume or changing the form of any such coastal beach or an adjacent or downdrift coastal beach.* The proposed Runway 33L RSA improvements would not affect the interests of the MA WPA significant to Coastal Beach. The Coastal Beach would continue to contribute to storm damage prevention, flood control, and the protection of wildlife habitat.

6.5.1.2 Runway 22R

The proposed Runway 22R Inclined Safety Area (ISA) meet MA WPA performance standards for the Coastal Bank, Coastal Beach, and Land Under the Ocean resource areas.

Coastal Bank

The work meets the regulatory performance standards for this resource area. The regulations at 310 CMR 10.30(3) through (8) establishes six general performance standards for work proposed in Coastal Bank. The Coastal Bank does not supply sediment to Coastal Beaches, Coastal Dunes, or Barrier Beaches. Therefore, the performance standards identified in 310 CMR 10.30(3) through (5) are not applicable, and only the performance standards identified in 310 CMR 10.30(6) and (8) are applicable.

- 310 CMR 10.30(6) *“Any project on such a coastal bank or within 100 feet landward of the top of such coastal bank shall have no adverse effects on the stability of the coastal bank.”* The proposed Runway 22R ISA improvements would not impact the interests protected by the MA WPA that are significant to Coastal Bank. The Coastal Bank at Runway 22R is not significant to storm damage prevention or flood control because it does not

⁷ Letter received from the Massachusetts Natural Heritage and Endangered Species Program dated March 26, 2010. NHESP's letter does not address the potential impacts of Taxiway C1 Connector. Massport will clarify this issue with NHESP. If an impact to endangered species habitat is identified by NHESP, Massport will work with NHESP to address that impact.



supply sediment to coastal beaches, coastal dunes, or barrier beaches. The ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation. It is not likely to impact any adjacent or downdrift Coastal Beach and will not interfere with littoral drift. The ISA would also maintain the stability of the shoreline, which over time, may have reduced stability due to the Runway 22R salt marsh erosion.

- 310 CMR 10.30(8) *“Notwithstanding the provisions of 310 CMR 10.30(3) through (7), no project may be permitted which will have an adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.”* The performance standard is not applicable. Based on review of the Natural Heritage Atlas (2008), portions of Logan Airport are mapped as Priority Habitat. The Upland sandpiper (*Bartramia longicauda*), which is listed as endangered in Massachusetts, is known to occur in the large grassy uplands in the interior of the airfield. However, the area around Runway 22R end is not mapped as Priority Habitat. Similarly, the area mapped as Estimated Habitat of Rare Wildlife is outside the project areas for the proposed runway-end safety improvements.

Coastal Beach

The work meets the regulatory performance standards for this resource area. The regulations at 310 CMR 10.27(3) through (7) establishes five general performance standards for work proposed in Coastal Beach. The Coastal Beach at Runway 22R is also Tidal Flat. The Coastal Beach at Runway 22R is significant to storm damage prevention, flood control, the protection of wildlife habitat and to marine fisheries. Performance standards set forth at 310 CMR 10.27 (3), (4), and (6) apply to the ISA improvements.

- 310 CMR 10.27(3) *“Any project on a coastal beach, except any project permitted under 310 CMR 10.30(3)(a), shall not have an adverse effect by increasing erosion, decreasing the volume or changing the form of any such coastal beach or an adjacent or downdrift coastal beach.”* The ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation. It is not likely to impact any adjacent or downdrift Coastal Beach. There have been no observed impacts at the Runway 22L ISA, a similar structure located 1,500 feet east of the proposed Runway 22R ISA.
- 310 CMR 10.27(4) *“Any groin, jetty, solid pier, or other such solid fill structure which will interfere with littoral drift...”* The proposed ISA will not interfere with littoral drift.
- 310 CMR 10.27(6) *“In addition to complying with all of the requirements of 310 CMR 10.27(3) and 10.27(4), a project on a tidal flat shall, ...if non-water-dependent, have no adverse effects on marine fisheries and wildlife habitat...”* The proposed Runway 22R ISA is a non-water-dependent project and will have no adverse effects on marine fisheries and wildlife habitat caused by changes in water circulation, alterations in the distribution of sediment grain size, and changes in water quality. Water quality in the vicinity of the proposed ISA could be temporarily impacted by short-term construction activities. However, construction would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.



Land Under the Ocean

The work meets the regulatory performance standards for this resource area. The regulations at 310 CMR 10.25 establish general performance standards for work proposed in Land Under the Ocean. The Land Under the Ocean and Nearshore Areas of Land Under the Ocean at Runway 22R are significant to storm damage prevention, flood control, the protection of wildlife habitat and to marine fisheries.

- 310 CMR 10.25(5) *“Projects not included in 310 CMR 10.25(3) or 10.25(4) which affect nearshore areas of land under the ocean shall not cause adverse effects by altering the bottom topography so as to increase storm damage or erosion of coastal beaches, coastal banks, coastal dunes, or salt marshes.”* The construction of the ISA may alter the bottom topography slightly. However, the work will not increase storm damage or erosion of Coastal Beaches, Coastal Banks, Coastal Dunes, or Salt Marshes.
- 310 CMR 10.25(6) *“Projects not included in 310 CMR 10.25(3), which affect land under the ocean shall, ...and if nonwater-dependent, have no adverse effects on marine fisheries and wildlife habitat...”* The proposed project will have no adverse effects on marine fisheries and wildlife habitat protected by Land Under the Ocean as the proposed project is not anticipated to cause any changes to the items listed in the performance standard. The proposed project is not expected to change wave direction or velocity or to result in increased erosion or deposition in the marine environment. Eelgrass and widgeon grass are not present in the Runway 22R project area. The proposed project will not introduce any pollutants to the marine environment. High densities of polychaetes, mollusks, or macrophytic algae are not present in the project area.

6.5.2 Wetlands Protection Act Variance Compliance

The proposed RSA Improvements Project would have permanent impacts to wetland resources. The proposed Runway 33L RSA improvements would include a pile-supported deck (approximately 470 feet long by 303 feet wide) that would affect coastal wetlands resources within an area of approximately 3.65 acres. Runway 33L improvements would not meet the MA WPA performance standards for Land Under the Ocean and Land Containing Shellfish because the proposed Runway 33L RSA improvements would eliminate approximately 66,600 square feet of eelgrass (*Zostera marina*) and displace or eliminate shellfish habitat by construction of the pilings. The proposed Runway 22R ISA improvements would have permanent impacts to coastal wetlands. The ISA, constructed with gravel fill, would replace coastal wetlands resources in an area of approximately 1.43 acres. The proposed Runway 22R ISA would not meet the performance standards for Salt Marsh (310 CMR 10.32(3)) or Land Containing Shellfish because the proposed improvements would eliminate approximately 35,040 square feet of Salt Marsh and displace or eliminate shellfish habitat in the intertidal zone. A Variance from the MA WPA is required for both the Runway 33L RSA and Runway 22R ISA improvements.

To initiate the Variance process, a Notice of Intent (NOI) was submitted to the Boston Conservation Commission (BCC) on January 20, 2010. Consistent with the MA WPA regulations, the BCC denied the proposed Project in its Order of Conditions (OOC). The BCC procedural denial was then followed by Massport's request to the DEP Northeast Regional Office for a Superseding OOC. On March 18, 2010, DEP denied the proposed Project in its Superseding Order, consistent with the MA WPA regulations. Massport submitted its request for a Variance from the MA WPA standards to the DEP Commissioner on March 31, 2010. DEP, in its letter dated June 22, 2010 provided a detailed list of information required for its review of the



Variance application including requirements for eelgrass and salt marsh mitigation, stormwater design, purpose and need, and alternatives. Chapter 4, *Environmental Consequences*, provides additional project details relative to the project impacts and Chapter 5, *Proposed Mitigation and Section 61 Compliance* provides an explanation of proposed mitigation measures. Other information has been provided to the DEP in separate submittals.

Variances may be granted by the Commissioner only if a proposed project meets three criteria.⁸ These criteria and the proposed RSA Improvements Project's compliance with them are presented below.

6.5.2.1 No Reasonable Conditions or Alternatives

"There are no reasonable conditions or alternatives that would allow the project to proceed in compliance with 310 CMR 10.21 through 10.60."

An extensive alternatives analysis was undertaken for the proposed RSA Improvements Project, as described in Chapter 2, *Alternatives*. This analysis found that there are no other alternatives that could be constructed with less of an impact to wetlands and in compliance with the regulatory performance standards that do not sacrifice safety. The No-Action/No-Build Alternative does not meet the project Purpose and Need. As discussed in Chapter 1, *Purpose and Need*, the FAA's required RSA improvements are necessary to accommodate an overriding public safety interest.

Runway 33L

There are RSA alternatives that avoid impacts to wetlands resource areas. However, these alternatives are not practicable because they would affect normal runway operations, runway capacity, or types of aircraft that can use the runways. Runway 15R-33L, the longest runway at Logan Airport and used for long-haul arrivals and departures, cannot have any reduced capacity or safety without adversely affecting the current airport operations. Other concerns that would affect runway operations that arose from alternatives that would not impact wetlands include:

- Any shift of the runway to the northwest would bring airport activities closer to the adjacent East Boston neighborhood.
- The Runway 33L glide slope indicator would need to be relocated into the protected area of Runway 27, and while objects fixed by function are allowed within the RSA, the FAA strives to limit these objects.
- There would be incompatible land uses within the Runway 15R Runway Protection Zone (RPZ).
- There would be increased penetrations to the Runway 15R approach surface and the Runway 33L departure surface, resulting in significant weight penalties and limits on runway usage during all-weather operations.

The only practicable alternative that meets project safety goals and minimizes wetlands impacts extends the RSA on a pile-supported deck into Boston Harbor. The footprint of the pile-supported deck decreases the wetlands impact. A filled structure would significantly increase impacts to wetlands, particularly to the eelgrass bed located at the Runway 33L end. Using EMAS in the Runway 33L RSA allows the footprint of the RSA to be

⁸ 310 CMR 10.05 (10)(a), *Wetlands Protection Act Regulations*.



smaller consistent with FAA design criteria. Using the smallest footprint allowable, while maintaining the safety level of the RSA, reduces the wetlands impact significantly.

Runway 22R

The Runway 22R ISA cannot be constructed without impacts to wetlands. Based on the alternatives analysis, the ISA provides the greatest amount of safety in combination with the existing EMAS bed while reducing the impacts to wetlands. A filled structure and a pile-supported deck have larger environmental impacts as well as significantly increased cost. The cost estimates of the filled structure alternatives and the pile-supported deck alternatives exceed the FAA's maximum feasible RSA improvement cost guidelines, therefore they are not practicable.

Increasing the strength of the existing EMAS blocks at Runway 22R was also evaluated. However, neither the design aircraft nor the fleet mix for this runway justifies the use of higher strength EMAS blocks. To limit potential structural damage to the aircraft that typically use this runway, the design of the EMAS would need to be changed, likely requiring an EMAS that would be longer than the existing 60 psi strength block design. The EMAS bed could not be strengthened within the same configuration at Runway 22R and it potentially would have impacts to wetlands, as the EMAS bed would need to be lengthened.

Massport also evaluated alternatives which would minimize the impacts of the ISA on coastal wetlands. As documented in Chapter 2, *Alternatives*, and in Chapter 4, *Environmental Consequences*, Massport evaluated both a narrower ISA and a steeper ISA, and found that neither modification would be consistent with the safety objectives of the project.

The only practicable safety measure at this location is to construct an ISA that would smooth the transition between the end of the runway and the water's edge. An ISA would re-grade this area to provide a more constant slope in the event that the aircraft exited the EMAS bed and entered the water, and would potentially reduce the loss of life and damage to an aircraft that fails stop within the existing EMAS bed. It would also significantly enhance access by rescue personnel. The ISA area has minimal wetlands impact when compared to other means of improving the RSA at this location, significantly increases the safety of Runway 4L-22R, and has a feasible cost estimate.

6.5.2.2 Mitigating Measures

"Mitigating measures are proposed that will allow the project to be conditioned so as to contribute to the protection of the interests identified in M.G.L. c.131, §40."

Unavoidable wetland impacts would be mitigated as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Massport is committed to providing full mitigation for impacts to Bank, Coastal Beach/Tidal Flats, Salt Marsh, Submerged Aquatic Vegetation (eelgrass), and Land Containing Shellfish. Massport has convened two working groups to discuss mitigation related to salt marsh and to eelgrass. The working groups comprise local, state, and federal agency representatives, Massport representatives, and Massport's permitting team. Mitigation concepts were developed in coordination with the representatives on both working group, and include:



- Constructing 2.83 acres of salt marsh and intertidal mud flat restoration at Rumney Marsh in Saugus; and
- Restoring 4.6 acres of eelgrass habitat at two locations: White Head Flats in Hull and Old Harbor West in Boston.

The Variance Order of Conditions issued by the DEP is anticipated to include constructing these mitigation areas. Shellfish mitigation would be provided for both the proposed Runway 33L and Runway 22R safety improvements. In addition to the intertidal flats in Rumney Marsh, shellfish mitigation includes:

- Monitoring blue mussel beds and pilings under the proposed Runway 33L RSA deck to confirm predictions of habitat enhancement; and
- Executing a Memorandum of Agreement with DMF to provide funding for activities to benefit commercial shellfish resources in Boston Harbor, similar to the shellfish mitigation previously completed for the installation of an ISA at Runway 22L.

Runway 33L

The proposed eelgrass mitigation for the proposed Runway 33L RSA improvements would restore lost eelgrass resource areas. Proposed potential eelgrass mitigation actions include, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*, the in-kind restoration of 4.6 acres, to meet a replacement ratio of 3:1⁹ through the restoration/re-establishment of previously existing eelgrass beds.

Runway 22R

The proposed salt marsh mitigation for the proposed Runway 22R ISA improvements would replace lost salt marsh resource areas, lost ecological functions, and affected wetland vegetation cover types. Massport proposes a mitigation goal of 2:1 replacement of filled wetland via restoration of formerly filled salt marsh based on current USACE and DEP guidance, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

6.5.2.3 Overriding Public Interest

"The variance is necessary to accommodate an overriding community, regional, state or national public interest; or that it is necessary to avoid an Order that so restricts the use of the property as to constitute an unconstitutional taking without compensation."

The Final EA/EIR documents the need for safety improvements at Logan Airport and substantiates the statement of Project Purpose (see Chapter 1, *Purpose and Need*), which is to increase safety for aircraft and passengers in emergency situations by improving the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's orders and regulations.

The purpose of the project is to protect the lives and safety of aircraft passengers in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's guidelines and Massport's responsibilities as airport operator. As stated in FAA Order 5100-38B, "The highest aviation priority of the United States is the safe and secure operation of the airport and airway system." The FAA supports this

⁹ U.S Army Corps of Engineers New England District. *Addendum to New England District Compensatory Mitigation Guidance: Compensation for Impacted Aquatic Resource Functions*. NAE-2006-3648. December 18, 2007.



policy by giving the highest priority to projects that enhance the safety and security of our national airport system. The FAA's National Priority Rating system gives the highest priority to constructing, extending, or improving RSAs. In addition, the DOT Inspector General's 2009 *Report to Congress On the Status of Runway Safety Areas at US Airports* listed Runway 33L at Logan Airport as one of the top 11 priority runway end safety enhancement projects in the US.

On May 4, 1993, DEP issued a variance under its MA WPA Regulations for the Runway-End Safety Improvement Project for Runway 22L at Logan Airport to be constructed. Like the project now being proposed by Massport, the 1993 project was undertaken to "enhance safety for aeronautical and rescue operations" pursuant to criteria established by the FAA (DEP Variance File No. 6-554/82-118, May 4, 1993). The reasoning underlying the 1993 DEP Variance Decision remains current and equally applicable to the RSA Improvements Project now proposed. In addition, DEP's recent decision on the 2008 Hanscom Field Runway Safety Area Project permitted that project to go forward.

First and foremost, the 1993 DEP Variance Decision clearly recognized the overriding public interest served by the Runway-End Safety Improvement Project:

"Chapter 456 of the Acts and Resolves of 1956 established Massport as a public instrumentality for the performance of an essential government function... The public interest to be served by the project is that of improving the degree of safety at the end of Runway 22L at Logan Airport. Existing conditions at the airport runway-end do not comply with recommended aeronautical safety standards and would inhibit efficient rescue operations.

"In coastal airports, an important development in the area of air crash/rescue strategy has involved the evolution of inclined safety areas (ISAs) at the water end of the runways. ISAs serve two major life-safety purposes. First, ISAs help cushion and retard the impact of an aircraft leaving the end of the runway and entering the water. Secondly, ISAs play an integral role in rescue operations once a crash has occurred.

"The initial benefit of the ISA is provided by the gradual slope and the materials used, which help reduce the possibility that an aircraft will break apart and expose passengers to the water. Once the crash has occurred, the ISA provides significantly improved survival chances for passengers by providing a relatively safe and easy pathway up and out of the water. Secondly, and more importantly, the ISA provides a safe deployment site for rescue personnel and equipment. ISAs provide a fast and efficient means of access to the water. ISAs provide a smooth transition from the runway end to the water by which trailered boats, dive teams, floating walkways and other rescue equipment can be deployed most rapidly. The absence of ISAs can result in significant delays in the critical moments following air crashes. For example, in the case of the September 21, 1989, USAir crash at LaGuardia Airport, fire fighting and rescue personnel were hindered from getting to victims in the water by the abrupt vertical drop-off at the end of the runway to



the shoreline and tidal flats below. Aviation experts agreed that the rescue efforts would have been significantly enhanced by the availability of the ISAs.

“In sum, I find that the applicant has established that the proposed project will promote an overriding public interest. The ISA at Runway 22-L will improve airport operations in the event of an aircraft accident, will help minimize aircraft damage in the event of an overrun/undershoot, and result in enhanced survivability from such accidents.”¹⁰

As explained in Chapter 1, *Purpose and Need*, the RSA improvements proposed at Runway 22R and Runway 33L are required to satisfy applicable FAA public safety criteria established to preserve the lives of the users of Logan Airport. As stated in Chapter 1, *Purpose and Need*, Logan Airport does not meet FAA standards for RSAs for either Runway 33L or Runway 22R.

DEP has found that similar RSA projects support an overriding public need. Variances have been issued to Massport for other RSA Improvements at Logan Airport and at Hanscom Field, and at Gardner, New Bedford, North Adams, Norwood, Pittsfield, and Provincetown Airports. As DEP has found in previous variances, RSA improvements constitute an overriding public need. DEP explicitly indicated in the New Bedford Airport Variance decision that inadequate RSAs are a public safety concern, and improving RSAs constitute an overriding public interest as they reduce the risk of damage to airplanes and loss of life. The ISA at Runway 22L at Logan Airport, the same RSA improvements proposed for Runway 22R, was determined to promote an overriding public interest in the 1993 Variance Decision.

6.5.3 Massachusetts Stormwater Management Standards

The proposed RSA Improvements Project requires work within wetland resource areas and buffer zones as defined and regulated under the MA WPA. Projects that fall under the jurisdiction of the MA WPA must comply with the Massachusetts 2008 Stormwater Management Standards (310 CMR 10.05).

The Stormwater Management Standards defines the requirements for stormwater management for new or re-development sites in the State of Massachusetts. The ten performance standards and compliance for the proposed RSA improvements at Runway 33L and Runway 22R are presented below. Although Massport proposes additional impervious surfaces to construct the proposed Taxiway C1 connector, this area is not within the jurisdiction of the Wetlands Protection Act.

6.5.3.1 Runway 33L

Compliance with the Stormwater Management Standards for Runway 33L is presented below. The Runway 33L 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 Standards 3, 4 and 6. However, because the proposed RSA will not generate stormwater pollutants other than through atmospheric deposition, the project will not adversely affect water quality or groundwater supply.

¹⁰ DEP Variance File No. 6-554/82-118, May 4, 1993



- **Standard 1:** *No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

No new outfalls will be constructed as part of this project. Stormwater that falls on the surface of the deck-based portion of the RSA will be collected by a series of scuppers along each side of the deck and will be discharged at several locations. Stormwater that falls elsewhere in the project area will be managed by the existing stormwater management system or will continue to sheet flow off of the airfield and into Boston Harbor as it does under existing conditions. Erosive forces from concentrated flow and impacts to the receiving water will be avoided by controlling runoff, providing multiple discharge locations, and positioning discharges at locations that are above open water throughout the tidal cycle.

Runoff from portions of the deck located seaward of mean low water will be collected by scuppers that will discharge directly beneath the deck at or near the location of the scupper. Runoff from portions of the deck located landward of mean low water will be collected by scuppers and piped in a separate drainage system that will discharge beneath the deck at a location seaward of mean low water. This design will prevent scour of benthic sediments from occurring during precipitation events which coincide with low tide. Stormwater runoff from the deck will not erode sediments adjacent to the deck because the discharge will be distributed and will only occur at locations that are inundated throughout the tidal cycle.

Discharge from the RSA deck scuppers do not represent a new discharge or a new source of pollutants and will not cause erosion in wetlands or waters of the Commonwealth. The RSA deck is not a source of pollutants and does not receive regular vehicle traffic or other sources of pollution. The only pollutants that would be in stormwater runoff from the deck are those that have deposited by atmospheric deposition and which are currently deposited directly onto the water surface of the Harbor. Stormwater runoff collected by the scuppers and discharged beneath the deck therefore does not require treatment because no new pollutants are present in the runoff. Distribution of discharge locations and placement of all discharge locations seaward of mean low water will prevent erosion or scour from occurring at this points.

- **Standard 2:** *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

Drainage from the Airport discharges to Boston Harbor, a tidal water body subject to coastal storm flowage. For this reason, the project is not required to meet this standard and no analysis of pre- and post-development peak rate discharges has been performed.

- **Standard 3:** *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type.*

The construction of the upland Runway 33L RSA improvements will result in changes to stormwater runoff by adding new impervious areas in existing grassed uplands. Although a portion of this increase will be offset by the removal of pavement in areas where the perimeter roadway will be relocated, the project will result in a net increase of approximately 11,000 square feet of impervious area. Under existing and proposed



conditions, these areas drain to Boston Harbor via sheet flow and do not contribute to groundwater recharge.

Due to the proximity to the Harbor, groundwater elevations across the airfield are tidally influenced. Furthermore, much of the airport is constructed on reclaimed land and the resulting soils are unsuitable for recharge. The proposed stormwater management system does not include infiltration BMPs because infiltration is not occurring under existing conditions and is not feasible at this location. There is inadequate separation from seasonal high groundwater and poor-quality fill materials. In light of the site constraints and location within a tidal waterbody, there is no loss of annual recharge to groundwater. Massport respectfully requests relief from Stormwater Standard 3.

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

No TSS will be generated by the proposed deck. The deck will not be sanded during the winter, is traversed by vehicles only 1-2 times per month, and therefore has negligible potential to generate TSS. Runoff from the portion of the perimeter roadway that will be relocated due to the construction of the RSA will be treated to the maximum extent practicable prior to discharge. The FAA prohibits the use of surface stormwater ponds, constructed stormwater wetlands or other surface treatment measures in order to minimize interactions with wildlife.

The quarterly testing that is being performed at the airport as part of the revised NPDES permit requirements has demonstrated that stormwater runoff from the airfield (runways, taxiways, and perimeter roads) is relatively free from contaminants, including TSS. Given the site constraints and the demonstration that runoff from runways, taxiways, and perimeter roads contains negligible quantities of pollutants, Massport respectfully requests relief from Stormwater Standard 4.

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

RSAs are not land uses with higher potential pollutant loads (i.e., apron, plane maintenance, plane deicing/anti-icing areas, fueling, plane or other vehicle storage). The DEP indicated that RSAs are not land uses with higher potential pollutant loads in a December 21, 2009, letter requesting information regarding the New Bedford Airport MA WPA Variance Decision (File No. SE 49-635).

- **Standard 6:** *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.*

There are no direct discharges within Zone II or Interim Wellhead Protection Area of a public drinking water supply from the proposed project. The Division of Marine Fisheries has designated an area of the intertidal mudflats surrounding Runway 33L as part of Shellfish Growing Area GBH5.3. Designated



shellfish growing areas are considered critical areas. The stormwater discharges associated with the deck-based portion of the RSA will contain uncontaminated runoff from an area that is not a source of pollution, does not receive regular vehicular traffic, and does not require treatment in order to avoid impacts to the critical area, and therefore creates no likelihood of a significant impact.

The stormwater discharges associated with the other elements of the project will be from areas that receive frequent sweeping and are not sanded. Runoff from taxiways and runways is predominantly managed as sheet flow from paved areas into vegetated infield areas before being collected by catch basins. As previously described in the response to Standard 4, FAA regulations and site constraints limit the range of BMPs that can be used for stormwater management.

Given the site constraints, the demonstration that runoff from runways, taxiways, and perimeter roads does not contain significant quantities of pollutants, Massport requests relief from Stormwater Standard 6.

- **Standard 7:** *Redevelopment of previously-developed sites must meet the Stormwater Management Standards to the maximum extent practicable: When it is not practicable to meet all the standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.*

The proposed Runway 33L RSA improvements are not a redevelopment project under the Stormwater Management Standards because the proposed improvements result in a net increase of impervious area.

- **Standard 8:** *Erosion, sedimentation, and other pollutant sources must be controlled during construction and land disturbance activities to prevent impacts.*

Erosion and sediment controls are proposed at the project's limit of work. The proposed improvements would require the issuance of an USEPA NPDES Stormwater Discharge Permit for Construction activities, which requires implementation of sedimentation and erosion controls. A comprehensive plan will be included in the project's NPDES Notice of Intent and Stormwater Pollution Prevention Plan. The SWPPP will target potential pollutant sources and the types of construction period erosion and sedimentation controls that will be required. This plan will specifically address measures that will be used to characterize and manage dredged sediments for appropriate handling and disposal, measures that will be deployed during construction activities by water-based craft, and measures that will be deployed during the upland earthwork and construction phases of the Runway 33L RSA improvements.

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

Operations and maintenance will be consistent with the existing Airport Operations Stormwater Pollution Prevention Plan (SWPPP). The operations and maintenance requirements for the proposed improvements are the same as those for other infrastructure already in operation at the Airport. Any alterations would be incorporated into the existing SWPPP currently in place for the Airport and would continue to be implemented under the existing NPDES Stormwater Permit.



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

Logan Airport has an Illicit Discharge Detection and Elimination (IDDE) program and prohibits illicit discharges from the stormwater management system. Illicit discharges are prohibited at the site. The improvements to the stormwater management system proposed at the Taxiway C1 Connector will connect only to the existing stormwater management system in the immediate vicinity of the project area; therefore, there is no potential for illicit discharges. No other alterations to the closed drainage system are proposed.

6.5.3.2 Runway 22R

Compliance with the Stormwater Management Standards for Runway 22R is presented below. The Runway 22R ISA, which does not contain any new impervious surfaces, will not be used by vehicles, and which is not redevelopment of an existing developed area, fully complies with these standards.

- **Standard 1:** *No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

No new stormwater conveyances will be created. The proposed project would not result in any new discharge of untreated stormwater directly to a water of the Commonwealth or to a location that would result in erosion in wetlands or waterways. The gradual stone slope of the proposed Runway 22R ISA will prevent scouring by runoff. The construction of the Runway 22R ISA does not require additional drainage infrastructure nor create any new stormwater conveyances.

- **Standard 2:** *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

Drainage from the Airport discharges to Boston Harbor, a tidal water body subject to coastal storm flowage. For this reason, the project is not required to meet this standard and no analysis of pre- and post-development peak rate discharges has been performed. Furthermore, construction of the ISA does not result in the creation of new impervious surface and therefore does not alter peak discharge rates.

- **Standard 3:** *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type.*

The Runway 22R ISA will consist of a 42-inch thick bed of crushed stone that is anchored on three sides with stone-filled gabions. These materials are pervious and will not prevent infiltration of stormwater. Due to the location of the ISA adjacent to and within a tidal water body, groundwater levels in the vicinity of the project are controlled by tidal activity. No streams rely on recharge at this location to provide base flow and no drinking water supplies are within the vicinity of the project area. Existing soils within the project area are identified as Udorthents, wet substratum, reflecting the history of land reclamation and high groundwater elevations in the area. These soils are not conducive to infiltration or recharge. Furthermore, 90 percent of the proposed inclined safety area will be located within intertidal areas where recharge is limited or does not occur. Portions of the ISA that are not submerged during rainfall events can capture and store runoff from rainfall events up to the 100-year storm.



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

The Runway 22R ISA involves the creation of a gravel bed within an area of Coastal Bank and adjacent intertidal and sub-tidal areas. The ISA does not involve the creation of an impervious surface, does not alter the drainage patterns in the project area and does not involve the construction of a structural stormwater management system. The ISA will not receive regular vehicle traffic and will not contribute TSS loading to stormwater runoff.

Massport's Environmental Management Program has developed a Long-Term Pollution Prevention Plan which addresses source control and pollution prevention measures that are employed at the airport. The runways, taxiways, and perimeter roads on the airfield which discharge stormwater runoff in the vicinity of the project area are swept at least weekly to remove any debris that may have accumulated due to wind or wildlife activity. Other than atmospheric deposition of pollutants which is occurring under existing conditions, no other source of stormwater pollutants is present in the project area.

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

RSAs are not land uses with higher potential pollutant loads (i.e. apron, plane maintenance, plane deicing/anti-icing areas, fueling, plane or other vehicle storage). The DEP indicated that RSAs are not land uses with higher potential pollutant loads in a December 21, 2009 letter requesting information regarding the New Bedford Airport MA WPA Variance Decision (File No. SE 49-635).

- **Standard 6:** *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.*

There would be no direct discharges within Zone II or Interim Wellhead Protection Area of a public drinking water supply from the proposed project. The Division of Marine Fisheries has designated an area of the intertidal mudflats surrounding Runway 22R as part of Shellfish Growing Area GMB5.2. Designated shellfish growing areas are considered critical areas. Replacing natural substrate with crushed stone will not result in new stormwater discharges to designated shellfish growing areas at the Runway 22R end.

- **Standard 7:** *Redevelopment of previously-developed sites must meet the Stormwater Management Standards to the maximum extent practicable: When it is not practicable to meet all the standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.*

The proposed improvements do not constitute redevelopment under the Stormwater Standards because it does not involve the maintenance and improvement of an existing roadway; does not involve the development, rehabilitation, expansion, or phased projects on a previously developed site; and is not a remedial project specifically designed to provide improved stormwater management.



- **Standard 8:** *Erosion, sedimentation, and other pollutant sources must be controlled during construction and land disturbance activities to prevent impacts.*

Erosion and sediment controls are proposed at the project's limit of work. The proposed improvements would require the issuance of an USEPA NPDES Stormwater Discharge Permit for Construction activities, which requires implementation of sedimentation and erosion controls. A comprehensive plan will be included in the project's NPDES Notice of Intent and Stormwater Pollution Prevention Plan.

The first step in the construction sequence would be to protect the perimeter of the inclined safety area by placing gabions (partitioned, wire fabric containers filled with stone to form flexible, permeable structures for earth retention). The gabions would be wrapped with filter fabric during construction to also act as a barrier to sediment releases and reduce resulting turbidity. The majority of the excavation would occur in the intertidal areas to remove soft organic soils and replace them with crushed stone/granular soil to provide a stable base for the slope. Excavation within the intertidal zone would be completed during periods of low tide. The area will be surrounded by a siltation curtain/ debris boom to contain and minimize any debris or siltation. Construction completed at the Runway 22R end would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts

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

There is no new stormwater management system proposed at the Runway 22R ISA. Operations and maintenance of adjacent areas will continue to be performed in accordance with the existing Airport Operations Stormwater Pollution Prevention Plan that is in place to provide compliance with Massport's existing NPDES Stormwater Permit.

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

No stormwater management system will be constructed as part of the ISA. Logan Airport has an IDDE program and prohibits illicit discharges from the stormwater management system. Illicit discharges are prohibited at the airport. There is no new stormwater management system proposed at the Runway 22R ISA; therefore, there is no potential for illicit discharges.

6.6 Massachusetts Water Quality Certification (Section 401 of the Clean Water Act)

The Secretary's Certificate on the Draft EA/EIR stated that the Final EA/EIR must demonstrate how the proposed RSA Improvements Project is in compliance with the Massachusetts Water Quality Certification Regulations (314 CMR 9.06(1)(a)). Projects that result in discharge or fill to a wetland or water body (any project that requires a Section 404 permit), require water quality certifications, pursuant to the federal Clean Water Act, Section 401, and the Massachusetts Clean Water Act (M.G.L. Chapter 21, Sections 26 – 53).



The proposed RSA Improvements Project would require an individual Section 401 Water Quality Certification, administered by the DEP Division of Wetlands and Waterways, because the proposed RSA Improvements Project would result in the loss of approximately 35,040 square feet of salt marsh and would impact land below mean high water, subject to federal jurisdiction. There are seven criteria for the evaluation of applications for discharge of dredged or fill material (314 CMR 9.06). These criteria and the proposed RSA Improvements Project's compliance with them are presented below. Massport requested a Section 401 Water Quality Certification from the DEP in January 2011.

- *"No discharge of dredged or fill material shall be permitted if there is a practicable¹¹ alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem."* Chapter 2, *Alternatives*, demonstrates that there are no alternatives which would allow Massport to comply with FAA safety standards that would not alter wetlands subject to jurisdiction under Section 401. The No-Action/No-Build Alternative does not fulfill the project's purpose and need because it does not fully comply with the FAA minimum overrun and undershoot requirements.
- *"No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts to the bordering or isolated vegetated wetlands or land under water, including a minimum of 1:1 restoration or replication of isolated or bordering vegetated wetlands."* Altered salt marsh at the Runway 22R end would be restored at a 2:1 ratio as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Affected eelgrass beds will be restored/re-established at a 3:1 equivalent ratio, also described in Chapter 5.
- *"No discharge of dredged or fill material shall be permitted to Outstanding Resource Waters (ORWs), except for the activities specified in 314 CMR 9.06(3)(a) through (i), which remain subject to an alternatives analysis and other requirements of 314 CMR 9.06."* The proposed RSA improvements do not involve the discharge of dredged or fill material to an outstanding resource water (ORW).
- *"Discharge of dredged or fill material to an ORW specifically identified in 314 CMR 4.06(1)(d) (e.g., vernal pools, areas within 400 feet of a water supply reservoir, and any other area so restricted) is prohibited as provided therein unless a variance is obtained under 314 CMR 9.08."* The proposed RSA improvements do not involve the discharge of dredged or fill material to an ORW.
- *"No discharge of dredged or fill material is permitted for the impoundment or detention of stormwater for the purposes of controlling sedimentation or other pollutant attenuation."* No discharge of dredged or fill material is planned in conjunction with the construction of stormwater management systems.
- *"Stormwater discharges shall be provided with BMPs to attenuate pollutants and provide a set back from receiving water or wetland."* The proposed stormwater management system for Runway 33L includes BMPs in compliance with DEP stormwater management policy to the extent practicable, as described in Section 6.5.3 and Chapter 5, *Proposed Mitigation and Section 61 Findings*. Logan's unique location, soils, hydrology, and

11 Section 404(b)(1) *Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR Part 230)* defines practicable as "The term practicable means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."



FAA safety requirements limit the applicability of certain of the Stormwater Standards. There are no stormwater discharges associated with the Runway 22R ISA.

- *"No discharge of dredged or fill material shall be permitted in the rare circumstances where the activity meets the criteria for evaluation but will result in substantial adverse impacts to the physical, chemical, or biological integrity of surface waters of the Commonwealth."* The proposed Project would not result in substantial adverse impacts to the surface waters of the Commonwealth, as described in Chapter 4, *Environmental Consequences*. Unavoidable impacts would be mitigated, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Stormwater management systems would meet applicable regulations and performance standards to the extent practicable, and stormwater runoff would not degrade surface water quality. Sediment and erosion controls would be employed during construction, also as described in Chapter 5.

6.7 Massachusetts Public Waterfront Act - Chapter 91

The RSAs are a required public safety measure associated with existing runways at Logan Airport. As such, they are an "Infrastructure Facility" as that term is defined by 301 CMR 9.02:

Infrastructure Facility means a facility which produces, delivers, or otherwise provides electric, gas, water, sewage, *transportation*, or telecommunication services to the public. (emphasis added)

Consequently, the standards for "Conservation of Capacity for Water-Dependent Use (310 CMR 9.51), "Utilization of Shoreline for Water-Dependent Purposes (310 CMR 9.52), and "Activation of Commonwealth Tidelands for Public Use (310 CMR 9.53) are inapplicable. Instead, pursuant to 310 CMR 9.55, a proposal for an "Infrastructure Facility" shall include "mitigation and/or compensation measures as deemed appropriate by the [DEP] to ensure that all feasible measures are taken to avoid or minimize detriments to the water-related interests of the public."

The Waterway Regulations list six potential water-related interests of the public that should be evaluated in connection with the permitting of an "Infrastructure Facility":¹²

- (a) the protection of maritime commerce, industry, recreation and associated public access;
- (b) the protection, restoration, and enhancement of living marine resources;
- (c) the attainment of water quality goals;
- (d) the reduction of flood and erosion-related hazards on lands subject to the 100-year storm event or to sea level rise, especially those in damage-prone or natural buffer areas;

¹² Waterways Regulations. 310 CMR 9.55(1).



- (e) the protection and enhancement of public views and visual quality in the natural and built environment of the shoreline;
- (f) the preservation of historic sites and districts, archaeological sites, and other significant cultural resources near waterways.

The RSA Improvements Project incorporates appropriate measures to protect water quality and to avoid and minimize any impacts to marine resources (salt marsh, eelgrass, and shellfish beds). Given the nature of the statutory Logan Airport Security Zone, the other water-related interests of the public are not applicable to this location.

When dealing with Infrastructure Facilities, DEP typically requires implementation of reasonable measures to provide open spaces for active or passive recreation at on near the water's edge only if and as "appropriate" under the specific circumstances. DEP's Waterway Regulations expressly recognize that any such measures "need to avoid undue interference with the infrastructure facilities in question, and to protect public health, safety, or the environment."¹³

Moreover, 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. c. 90, § 61, the RSA Improvements Project may appropriately be treated as a "Project With Special Legislative Authorization" under 310 CMR 9.31(4). In such cases, no variance is required; instead, DEP may prescribe such alterations and conditions as it deems necessary to ensure the project conforms with:¹⁴

- (a) any requirements contained in the legislative authorization; and
- (b) the standards of 310 CMR 9.31 through 9.60, to the extent consistent with the legislative authorization.

In addition, the DEP may authorize the RSA Improvements Project pursuant to a Memorandum of Understanding (MOU) with Massport that incorporates appropriate conditions and mitigation measures.¹⁵

The DEP concurred that the RSA improvements would be evaluated on the standards related to "Infrastructure Facilities." Since public access is restricted due to security concerns, the DEP's review will concentrate on the resource impacts to salt marsh, eelgrass, and loss of shellfish habitat and adequate mitigation of those impacts

¹³ Waterways Regulations, 310 CMR 9.55(2).

¹⁴ Waterways Regulations, 310 CMR 9.31(4).

¹⁵ Waterways Regulations, 310 CMR 9.03(3).



in accordance with 310 CMR 9.55(1)(b-c).¹⁶ A draft Chapter 91 License Application based on the DEP's guidance was filed with the DEP in January 2011.

Massport believes that the Runway Safety Area Improvements Project meets the definition of a "water-dependent" project under the DEP Waterways Regulations at 310 CMR 9.12(a)(10), which identifies "navigation aids, marine police and fire stations, and other facilities which promote public safety and law enforcement on the waterways" as water-dependent uses. The Runway Safety Areas are intended to prevent aircraft from entering Boston Harbor (the Runway 33L RSA) or to provide a safe transition for aircraft between the runway and the harbor (the Runway 22R ISA). These functions cannot possibly be provided "away from the harbor," 310 CMR 9.12(2), and thus are "water-dependent" for all practical purposes. The Runway Safety Areas manifestly "promote public safety and law enforcement on the waterways" and therefore should be treated as water-dependent under the DEP Waterways Regulations.

6.7.1 Chapter 91 Variance Standards

To the extent that DEP makes a final determination that the proposed RSA Improvements Project is not a water-dependent use, a Variance will be required from the Waterways Regulations. Moreover, if DEP determines that the RSA Project is not water-dependent, DEP may also conclude that variances are necessary and appropriate with respect to at least three standards: Categorical Restrictions on Fill and Structures (310 CMR 9.32); Attainment of Water Quality Goals (310 CMR 9.55(1)(c)); and Protection, Restoration, and Enhancement of Living Marine Resources (310 CMR 9.55(1)(b)).

The proposed RSA improvements have undergone an extensive alternatives analysis in order to avoid and minimize impacts, including the type and size of the proposed RSA improvements. The alternatives analysis by minimizing the size and type of the proposed structure also minimizes the impacts to living marine resources within the project areas. Compensatory mitigation is proposed to restore living marine resources (salt marsh, shellfish, and eelgrass). If and to the extent that the proposed RSA Improvements Project cannot comply with all of the applicable Waterways Regulations, the proposed project requires a Variance from the Chapter 91 regulations.

In many respects, the variance standards under DEP's Waterway Regulations, 310 CMR 9.00 et seq., parallel the variance requirements under DEP's Wetlands Protection Act Regulations, 310 CMR 10.00 et seq. discussed above at Section 6.5. Under 310 CMR 9.21, a variance may be granted if the Commissioner finds that:

- (a) there are no reasonable conditions or alternatives that would allow the project to proceed in compliance with 310 CMR 9.00;
- (b) the project includes mitigation measures to minimize interference with the public interests in waterways and the project incorporates measures designed to compensate the public for any remaining detriment to such interests; and

¹⁶ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report submitted by the Massachusetts Department of Environmental Protection, dated September 2, 2010.



- (c) the variance is necessary to accommodate an overriding municipal, regional, state or federal interest.

A variance may be granted to accommodate an overriding public interest. Reasonable conditions and alternatives must be explored to achieve compliance with the regulations if feasible. Mitigation measures must be included to advance the statutory interests and compensate for detrimental environmental impacts.

6.7.2 No Reasonable Conditions or Alternatives

"There are no reasonable conditions or alternatives that would allow the project to proceed in compliance with 310 CMR 9.00."

An extensive alternatives analysis was undertaken for the proposed Project, as described in Chapter 2, *Alternatives*. This analysis found that there are no reasonable alternatives that would allow the existing RSAs to be enhanced to meet FAA standards and the same time be in compliance with the Waterways Regulations, as the site limitations necessitate construction in tidelands below mean high water. As demonstrated in Chapter 1, *Purpose and Need*, the proposed RSA improvements are necessary to accommodate an overriding public/safety interest. During the subsequent design phases of the proposed RSA improvements, additional design modifications would be investigated to ensure that waterways impacts have been minimized to the extent practicable.

6.7.3 Mitigation Measures

"The project includes mitigation measures to minimize interference with the public interests in waterways and that the project incorporates measures designed to compensate the public for any remaining detriment to such interests."

- *Shellfishing Mitigation.* The construction of the Runway 22R ISA would alter an area that supports shellfish. However, as described in Chapter 3, *Affected Environment*, the densities of soft-shell clams is low and concentrated in the eastern portion of the Runway 22R ISA and only two market size individuals (minimum size 2 inches) were observed in a survey. Shellfish mitigation would be provided for both Runway 33L RSA and Runway 22R ISA improvements, consisting of monitoring the Runway 33L pile-supported deck pilings, mudflat creation as part of the Rumney Marsh restoration, and an in-lieu funding agreement with the DMF.
- *Salt Marsh Mitigation.* Massport proposes a salt marsh mitigation goal of 2:1 replacement of filled wetland via restoration of formerly filled salt marsh or creation of salt marsh in uplands based on current USACE and DEP guidance.
- *Eelgrass Mitigation.* Proposed eelgrass mitigation actions include possible in-kind restoration and/or out-of-kind mitigation that will improve the protection of existing beds in Boston Harbor and elsewhere (contributions to statewide eelgrass mapping, conservation mooring, or eelgrass ecology studies), as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.
- *Water Quality Mitigation.* Water quality goals will be attained through the use of stormwater BMPs. Specifically, mitigation would include improving current stormwater management conditions, to the extent practicable, to meet the Stormwater Management Standards, as discussed in Section 6.5.3.



- *Storm Damage Prevention.* The proposed Runway 33L RSA improvements would convert the existing rip-rap bank to a sheet pile bank or crushed stone ramp, and would not affect the functions or significant interests of the Coastal Bank including storm damage prevention and flood control. The new sheet pile bank and crushed stone ramp would provide additional stability to the Coastal Bank. The Coastal Bank at Runway 22R is not significant to storm damage prevention or flood control because it does not supply sediment to coastal beaches, coastal dunes, or barrier beaches. The ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation. It is not likely to impact any adjacent or downdrift Coastal Beach and will not interfere with littoral drift. The ISA would also maintain the stability of the shoreline, which over time, may have reduced stability due to the Runway 22R salt marsh erosion. The proposed RSA Improvements would not impact the ability of the Coastal Bank to protect Logan Airport from flood damage or erosion, therefore mitigation measures are not proposed.
- *Protection of Archeological Resources.* There are no known historic sites and districts, archaeological sites, or other significant cultural resources located within the proposed RSA Improvements Project area. The Massachusetts Historical Commission (MHC) and the Massachusetts Board of Underwater Archaeological Resources concurred with this determination.^{17,18} However, in order to mitigate for any unintended consequences during construction, an Unanticipated Discovery Plan would be developed by Massport and implemented during construction. Massport would coordinate with the FAA, MHC, Tribal Historic Preservation Officer(s), and the Board of Underwater Archaeological Resources to determine the protocol should an unanticipated discovery be made during construction of the Runway 22R ISA in accordance with the Board of Underwater Archaeological Resources *Policy Guidance for the Discovery of Unanticipated Underwater Archaeological Resources*, September 2006.

6.7.4 Overriding Public Interest

"The variance is necessary to accommodate an overriding municipal, regional, state or federal interest; or to avoid such restriction on the use of private property as to constitute an unconstitutional taking without compensation; or to avoid substantial hardship for the continuation of any use or structure existing as of October 4, 1990, and for which no substantial change in use or substantial structural alteration has occurred since that date."

The purpose of the project is to protect the lives and safety of aircraft passengers in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's guidelines and the Authority's responsibilities as airport operator. As stated in FAA *Order 5100-38B*, "The highest aviation priority of the United States is the safe and secure operation of the airport and airway system." The FAA supports this policy by giving the highest priority to projects that enhance the safety and security of our national airport system. The FAA's National Priority Rating system gives the highest priority to constructing, extending, or improving RSAs. In addition, the *DOT Inspector General's 2009 Report to Congress On the Status of Runway Safety Areas at US Airports* listed Runway 33L at Logan Airport as one of the top 11 priority runway end safety enhancement projects in the United States (emphasis added).

¹⁷ Letter received from the Massachusetts Historical Commission, dated December 7, 2007.

¹⁸ Comment Letter on the Draft Environmental Assessment/Environmental Impact Report received from the Massachusetts Board of Underwater Archaeological Resources, dated August 25, 2010.



Section 6.5 of this Final EA/EIR documents how the proposed safety projects meet this standard, based on FAA policy and requirements and DEP's prior Variance Decision on the Runway 22L Safety Area Improvement which clearly recognized the overriding public interest served by these safety projects.

6.8 Massachusetts Public Benefits Determination

The Public Benefits Determination Regulations (310 CMR 13.00) establish a procedure for the Secretary of Energy and Environmental Affairs 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 DEP will incorporate the public benefit determination into the official record of the Chapter 91 decision.

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

6.8.1 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 RSAs at the ends of Runway 33L and Runway 22R consistent with FAA's orders and regulations (see Chapter 1, *Purpose and Need*).¹⁹ 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.²⁰ The project will also protect Boston Harbor in the event of an overrun or undershoot event, by preventing aircraft from entering the harbor.

6.8.2 Impact on Abutters and the Surrounding Community

There will be no 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 1,500 feet creates a buffer. There will be no permanent change to air quality or noise at the airport as a result of the proposed safety improvements, and there are no changes to aircraft operations. Chapter 5, *Proposed Mitigation and Section 61 Findings*, describes mitigation commitments for any impacts during construction.

6.8.3 Enhancement to the Property

The proposed RSA Improvements Project includes important safety improvements at the Airport. The existing Runway 33L RSA does not meet current FAA design criteria for overrun and undershoot protection for the

¹⁹ Letter from the U.S. Army Corps of Engineers to Stewart Dalzell, Massport. Dated March 12, 2010.

²⁰ United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.



runway's design aircraft (Boeing 747-400). The Runway 33L Proposed Action would include construction of a 600-foot long RSA with EMAS partially located on a 470- by 303-foot wide Pile-Supported Deck. The Proposed Action would maintain runway utility and capacity, and would provide protection and functionality near equivalent to a RSA that fully meets the design criteria.²¹

The existing Runway 22R RSA meets the minimum FAA design criteria for overrun protection for the runway's design aircraft, the Boeing 757-200. However, improvements to the Runway 22R RSA are critical to protect aircraft in the event that an aircraft arriving on Runway 4L overruns and fails to stop on the runway. The Runway 22R Proposed Action would enhance the existing RSA by constructing an ISA at the end of Runway 22R. The ISA would not increase the arrestment speed of the existing 60 psi strength EMAS bed, but would provide a smoother transition into the water for any aircraft that exits the runway at a speed greater than 40 knots. The Proposed Action includes re-grading of the current elevation change and slope gradient from the end of the existing EMAS bed down to the mean low water elevation. This action would provide a constant slope in the event that the aircraft exited the EMAS bed and entered the water, and would reduce the potential for loss of life and damage to any aircraft that fails to stop within the existing EMAS bed. It would also significantly enhance access by rescue personnel as well as egress by passengers.

6.8.4 Benefits to the Public Trust Rights in Tidelands

In light of 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 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. In recent history, no shellfishing has been observed in the area adjacent to Runway 33L.

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 5, *Proposed Mitigation and Section 61 Findings*. Water quality goals will continue to be attained.

6.8.5 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.

²¹ Federal Aviation Administration, *Runway Safety Area Determination: Runway 15R-33L General Edward Lawrence Logan International Airport East Boston, Massachusetts*, January 30, 2009, p. 6.



6.8.6 Environmental Protection and Preservation

The proposed RSA Improvements Project aims to avoid and minimize impacts to wetland resources, as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Mitigation measures for impacts to wetlands and eelgrass resources are proposed. Proposed eelgrass mitigation actions include in-kind restoration at a 3:1 ratio as described in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Massport proposes a wetland mitigation goal of 2:1 replacement of filled wetland via restoration of formerly filled salt marsh based on current USACE and DEP guidance.

6.8.7 Public Health and Safety, and the General Welfare

The RSA improvements will address an overriding public interest in aviation safety. Safety enhancements to the RSAs 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.



7

Public and Agency Involvement

7.1 Introduction

Massport and the Federal Aviation Administration (FAA) have made public and agency involvement a priority for the Logan Airport Runway Safety Area (RSA) Improvements Project. Because of the nature of this critical aviation safety project and the affected resource areas, informal and formal briefing sessions with local, state and federal agencies and community groups commenced well in advance of the initial regulatory filings. These meetings included project overview briefings with organized community groups interested in airport activity and a broad constituency of regulatory agencies and harbor advocacy groups. The following sections summarize meetings both with community groups and regulators. This community and agency outreach and coordination will continue through permitting, design, and construction of the proposed safety improvements.

FAA *Order 1050.1E*¹ updates FAA policies and procedures for compliance with the National Environmental Policy Act (NEPA) and implementing regulations issued by the Council on Environmental Quality (40 CFR Parts 1500-1508). Project proponents are required to obtain information from the public regarding environmental concerns surrounding the proposed action, fully assess and disclose potential environmental impacts resulting from the proposed action and alternatives, and provide the public with this information and allow it to comment on these findings. FAA *Order 5050.4B* provides the FAA Office of Airports with guidance on evaluating environmental effects of a project. Specific requirements for ensuring proper public input include direct coordination with resource agencies, industry groups, and the affected community.

In coordination with the FAA, Massport has sought public involvement throughout the scoping, planning, and analysis of the proposed Logan Airport RSA Improvements Project. Comments received during early coordination on environmental impacts of proposed actions have been considered and are addressed in Chapter 4, *Environmental Consequences*. Public involvement was provided while the Environmental Notification Form (ENF), Draft Environmental Assessment/Environmental Impact Report (EA/EIR), and the Final EA/EIR were drafted, as described in further detail in the following subsections. Massport has also consulted directly

¹ United States Department of Transportation, Federal Aviation Administration, Order 1050.1E, *Environmental Impacts: Policies and Procedures*, March 20, 2006.



with resource agencies, and the adjacent community regarding potential impacts, minimization of these impacts, and mitigation strategies.

The Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11.00) also include specific requirements for filing environmental reports and ensuring inclusive public involvement. Massport has met or exceeded each requirement for the filing of the ENF and the Draft and Final EA/EIR, as described in this Chapter.

7.2 Public Involvement

Massport has provided for public involvement in the proposed RSA Improvements Project in accordance with FAA Order 1050.1E² and FAA Order 5050.4B and the MEPA regulations.

7.2.1 Community Coordination

Well in advance of any regulatory filings, Massport presented the proposed safety improvements to two East Boston community groups. The initial two public briefings were held on October 15, 2007 with the Orient Heights Civic Association and on October 24, 2007 with AIR, Inc. The goal of these meetings was to acquaint the nearby community with the overall safety project and solicit early input regarding potential neighborhood issues. Massport continues to informally update those groups on project status and review opportunities and schedules.

Following the publication of the Draft EA/EIR, Massport representatives attended a Town of Winthrop Conservation Commission meeting on August 11, 2010. At the meeting, Massport presented the proposed safety improvements to the Conservation Commissioners as well as the public in attendance. The purpose of attending the Commission's meeting was to provide the Commissioners the opportunity to ask questions regarding the environmental impact and proposed mitigation strategies. Although there is no work proposed within the Town of Winthrop, the safety improvements will occur along the harbor's edge within sight of the town.

Massport has coordinated with the local shellfishing industry and shellfishing representatives with the assistance of the Massachusetts Division of Marine Fisheries (DMF). Massport held an information meeting with time for questions and answers on December 14, 2010. Invitations were mailed to all shellfishers badged for access to the Logan shellfish beds, and the DMF posted notices of the meeting approximately two weeks prior to the meeting at the local shellfish depuration plant. Nineteen Massport-badged shellfishers were in attendance at the meeting as well as representatives from the DMF. Those in attendance provided input on existing resources as well as the mitigation strategy, which is incorporated in Chapter 5, *Proposed Mitigation and Section 61 Findings*. Massport anticipates holding an additional meeting with shellfishing representatives to review the proposed mitigation measures.

² United States Department of Transportation, Federal Aviation Administration, Order 1050.1E, *Environmental Impacts: Policies and Procedures*, March 20, 2006.



7.2.2 NEPA and MEPA Coordination

The project ENF was circulated to interested parties and a Public Notice of Environmental Review was published on July 8, 2009, in accordance with MEPA regulations 301 CMR 11.05 and 11.15. To solicit public input on development of the Draft EA/EIR scope, a public scoping meeting was held at Logan Airport on July 30, 2009. The FAA also attended this meeting to gather information in consideration of the scope of the NEPA Environmental Assessment.

The Draft EA/EIR was available for public review to solicit comments and Massport circulated the document in accordance with FAA *Order 5050.4B, Paragraphs 404-406 and 804*, and Sections 11.07 and 11.16 of the MEPA regulations. Notice of the public meeting appeared in local, general circulation newspapers, and was mailed to Massport's standard MEPA mailing list, as periodically updated. Commenters on the ENF and other interested parties also received the document. Although not requested, Massport was ready to accommodate the needs of the elderly, handicapped, non-English speaking, minority, and low-income populations. As requested in the Certificate on the ENF, the Draft EA/EIR was distributed to the shellfishing industry and local shellfishing representatives so that they are aware of impacts to land containing shellfish. A copy of the Draft EA/EIR was available for public review at the Boston Public Library (East Boston Branch), the Revere Public Library, the Chelsea Public Library, the Everett Public Library, and the Winthrop Public Library, as requested in the Certificate. Massport has followed and will continue to follow the guidance in the FAA *Community Involvement Manual* in organizing and scheduling public meetings.³ The standard 30-day MEPA public comment period was extended to 45 days to provide additional comment time for reviewers and also align with the federal EA review schedule. Massport and FAA received eleven comment letters, including one from an individual and one from a non-governmental entity. All comment letters and responses to comments are provided in Appendix 2, *Response to Comments*.

The same provisions made for the distribution of the Draft EA/EIR have been made for the distribution of the Final EA/EIR in accordance with FAA *Order 5050.4B, Paragraphs 404-406 and 804*, and Sections 11.07 and 11.16 of the MEPA regulations. A 30-day MEPA public comment period is available following the publication of the *Massachusetts Environmental Monitor*. This Final EA/EIR is available for review at multiple Boston Public Library branches, including the East Boston branch, the Chelsea Public Library, the Everett Public Library, the Winthrop Public Library, and the State Transportation Library. The Final EA/EIR was sent to those who commented on the Draft EA/EIR, to state and federal agencies from which Massport will seek permits or approvals, and to the Massport standard MEPA and NEPA mailing lists. The entire distribution list is provided in Chapter 8, *Distribution List*. There are also a number of copies available for any future requests, and accommodations will be made for the elderly, handicapped, non-English speaking, minority, and low-income populations.

7.2.3 Wetlands Protection Act Coordination

To initiate public review under the state wetlands regulatory process, Massport filed a Notice of Intent (NOI) with the Boston Conservation Commission. A Notice of the Public Hearing regarding the NOI for the proposed Project, as required under the Massachusetts Wetlands Protection Act (MA WPA), was published in The Boston

³ U.S. Department of Transportation. *Public Involvement Techniques for Transportation Decisionmaking* (FAA-EE-90-3). August 1990. Chapter 2: Community Involvement Manual.



Herald and was posted in Boston City Hall on January 26, 2010. The NOI public hearing was held on February 3, 2010. In addition to meeting its regulatory obligations, Massport also mailed notification to residents of the Bayswater neighborhood in East Boston on January 25, 2010 informing residents about the NOI and the upcoming hearing. There are no direct abutters to the project, but the Bayswater area is the closest residential neighborhood to the Runway 22R end. There are no neighborhoods in close proximity to the Runway 33L project site.

7.2.4 Massport Website

Massport posts information about key regulatory filings on its website. The most recent environmental filings, including the Draft EA/EIR, are available at the following URL:

http://www.massport.com/environment/environmental_reporting/Pages/EnvironmentalFilings.aspx. The Final EA/EIR and Appendices are available on the website at the URL above.

7.3 Agency Consultation and Coordination

The Draft EA/EIR was distributed to local, state, and federal agencies for their review and comment. Responses to agency comments are provided in Appendix 2, *Response to Comments*. Those agencies that provided comments on the Draft EA/EIR include:

- United States Army Corps of Engineers (USACE)
- United States Environmental Protection Agency (USEPA)
- National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS)
 - Protected Resources
 - Habitat Conservation
- Massachusetts Board of Underwater Archaeological Resources
- Massachusetts Department of Environmental Protection (DEP)
- Massachusetts Department of Fish and Game, Division of Marine Fisheries (DMF)
- Massachusetts Office of Coastal Zone Management (CZM)
- City of Boston Environment Department (CBED)
- City of Boston Transportation Department (BTD)

Prior to the submittal of the ENF, Massport began agency consultation and coordination by reaching out to numerous resource agencies to receive data and feedback regarding affected environmental resources and potential impacts. Letters were mailed to agencies in November 2007 requesting specific information such as: federally protected threatened and endangered wildlife, fishery, or plant species; Priority Habitat and Estimated Habitat of Rare Wildlife locations; and historic or cultural resources. The results of this coordination were documented in the Draft EA/EIR.



On September 26, 2007, Massport convened an informal resource agency briefing to introduce agency representatives to the proposed Project. The following agencies were represented:

- FAA
- USACE
- U.S. Fish and Wildlife Service (USFWS)
- CZM
- DMF
- DEP
- Massachusetts Environmental Policy Act (MEPA) Office
- NMFS
- CBED
- BTD

Representatives were made aware of FAA's nationwide requirement to provide runway safety areas that meet FAA standards, to the extent practicable, at all Part 139⁴ certificated airports by 2015 and the goal to meet those standards at Logan Airport by 2013. Meeting attendees were provided with an overview of FAA's RSA design standards and Massport's on-going program to improve RSAs at Logan Airport. A description of existing conditions at the ends of Runway 33L and Runway 22R was provided by Massport, as well as an overview of the proposed RSA Improvements Project. Natural resources located within the proposed Project area and potential permit requirements were identified.

A second agency briefing occurred on March 26, 2009 with federal and state resource agencies to inform agency representatives of specific Project elements for Runway 33L and Runway 22R.

Massport has held three agency coordination meetings in addition to the resource agency briefings (Table 7.3-1). These meetings were held to receive agency feedback on the proposed alternatives, impacts to natural resources, regulatory compliance, and mitigation strategies. In addition, Massport met independently with numerous resource agencies to discuss various aspects of the project, environmental consequences, proposed mitigation, and other issues of concern. The table below provides a list of the meetings and the topics covered during the meeting. Agency representatives were notified by email and/or letter in advance of each meeting. As described in the following sections, Massport has convened two working groups, the Salt Marsh and Eelgrass Working Groups, to specifically focus on mitigation opportunities for those natural resources.

⁴ Part 139 certified airports are the airports that serve scheduled and unscheduled air carrier aircraft with more than 30 seats, serve scheduled air carrier operations with more than 9 seats but less than 31 seats; and those that the FAA Administrator requires to have a certificate.



Table 7.3-1 Agency Coordination Meetings

Resource Agency(ies)	Date	Topic
Agency Briefing (1)	7/27/2007	Project Overview
Notice of Intent Hearing (Massport, Boston Conservation Commission)	10/17/2007	Hearing to receive permission to drill borings for geotechnical investigation at proposed project site.
Boston Environment Department	6/8/2008	Initial Project Briefing
Agency Briefing (2)	3/26/2009	Alternatives, impacts to natural resources, regulatory compliance, and mitigation strategies
Eelgrass Mitigation Working Group Meeting 1 (NMFS, USEPA, CZM, DEP, DMF)	4/17/2009	Project overview and impacts, mitigation goals and criteria.
Boston Environment Department (Env. Dept. Staff, Massport)	6/5/2009	Project Status Update
Eelgrass Mitigation Working Group Meeting 2 (USACE, NMFS, USEPA, DEP, DMF)	7/9/2009	Project impacts, mitigation requirements, regulatory compliance.
MEPA/NEPA Scoping (FAA, MEPA Staff, Massport)	7/30/09	Project overview, impacts.
Eelgrass Mitigation Working Group Meeting 3 (USACE, USEPA, DEP, DMF)	7/31/2009	Mitigation requirements, potential mitigation sites, regulatory compliance.
Agency Site Walk (all Resource Agencies)	9/25/2009	Visit to Runways 22R and 33L end to visualize proposed project and potential impacts.
DEP Bureau of Resource Protection	10/15/2009	Water quality issues and regulatory compliance.
Salt Marsh Mitigation Working Group Meeting 1 (FAA, USACE, USEPA, CZM, DEP, DMF, DCR, CBED)	10/23/2009	Revised mitigation sites, regulatory compliance.
Boston Environment Department	12/16/2009	Project overview, impacts.
Boston Conservation Commission	2/3/2010	Public hearing in regard to Notice of Intent submittal
DEP Waterways	2/8/2010	M.G.L. Chapter 91 regulatory compliance.
Salt Marsh Mitigation Working Group Meeting 2 (FAA, USACE, USEPA, CZM, DEP, DMF, DCR, CBED)	2/22/2010	Anticipated impacts, mitigation goals and criteria, potential mitigation sites, regulatory compliance.
Eelgrass Mitigation Working Group Meeting 4 (USACE, NMFS, USEPA, CZM, DEP, DMF, DCR)	3/19/2010	Potential mitigation sites, regulatory compliance.
Joint Salt Marsh Working Group and Eelgrass Working Group Meeting	6/9/2010	Further discussion of potential mitigation sites, regulatory compliance.
DEP Waterways	6/14/10	M.G.L. Chapter 91 Public interests determination, Chapter 91 Variance review
MEPA Office	7/2010	Draft EA/EIR Briefing
USACE	7/28/2010	Potential salt marsh mitigation site visit



Table 7.3-1 Agency Coordination Meetings

Resource Agency(ies)	Date	Topic
United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS)	8/5/2010	Eelgrass and salt marsh mitigation
National Park Service and Boston Conservation Commission	8/6/2010	Potential salt marsh mitigation site visit
Joint Salt Marsh Working Group and Eelgrass Working Group Meeting	8/19/2010	Discussion of revised eelgrass and salt marsh mitigation strategy
DEP (via conference call)	9/13/2010	Stormwater impacts and design
Eelgrass Working Group Coordination (via email)	10/1/2010	Concurrence on eelgrass site selection sampling protocol
DMF	11/9/2010	Shellfish impacts and mitigation
DMF	12/14/2010	Informational meeting with shellfishing representatives
Joint Salt Marsh Working Group and Eelgrass Working Group Meeting	12/17/2010	Presentation of eelgrass mitigation findings, salt marsh mitigation, and permit schedule.
Salt Marsh Mitigation Site Visit DCR, DEP, USACE, and USEPA	1/5/2011	Site visit to Rumney Marsh to discuss salt marsh mitigation design and constraints.
DEP	1/6/2011	Discussion of stormwater design

7.3.1 Salt Marsh Mitigation Working Group

Massport established an interagency Salt Marsh Mitigation Working Group to develop a mitigation approach for the RSA improvements at Runway 22R end that would fulfill all agency rules and regulations for mitigation of impacts to salt marshes. Specifically, mitigation criteria, including USACE compensatory mitigation and DEP mitigation standards, mitigation goals, and potential mitigation sites are discussed among Working Group members. Active Working Group resource agencies include FAA, USACE, USEPA, CZM, DEP, Massachusetts Division of Conservation and Recreation (DCR), Massachusetts Department of Fish and Game Division of Ecological Restoration (DER), and CBED.

The first Salt Marsh Mitigation Working Group meeting occurred on October 23, 2009 where anticipated salt marsh impacts from the proposed Inclined Safety Area at Runway 22R were discussed (there is no salt marsh at Runway 33L end). Specific mitigation criteria, including USACE compensatory mitigation and DEP mitigation standards, were discussed. The Salt Marsh Working Group was asked to help develop a list of potential mitigation sites. A follow-up Working Group meeting occurred on February 22, 2010 to solicit feedback on Massport’s identification of potential mitigation sites for the proposed RSA Improvements Project. Massport provided an overview of the site identification process and asked for the Working Group’s assistance in narrowing down the list to a manageable number of sites for field investigation purposes. Mitigation goals, categories, and types were discussed (see Chapter 5, *Proposed Mitigation and Section 61 Findings*, for further details).



Joint Working Group meetings were held in June and August 2010. The type and location of salt marsh mitigation did not receive consensus, and two additional sites (Long Island and Broad Meadows) were identified as potential salt marsh mitigation opportunities. Outside of the Working Group meetings, Massport has coordinated with the resource agencies to gain consensus on a salt marsh mitigation site. During the December 2010 Working Group meeting, consensus was reached for the type and location of salt marsh mitigation: at Rumney Marsh with a combination of high and low marsh as well as mud flat mitigation. On January 5, 2011 Massport and members of the Salt Marsh Working Group visited the proposed mitigation sites and discussed design and construction methods.

Massport anticipates holding additional meetings with the Salt Marsh Working Group for continued coordination during the permitting process.

7.3.2 Eelgrass Mitigation Working Group

An Eelgrass Mitigation Working Group was established to develop an appropriate approach for offsetting the potential loss of eelgrass beds within the Runway 33L proposed improvement area. Direct impacts (removal within footprint of proposed pile-supported deck), indirect impacts (shading or sediment deposition), mitigation options, state and federal mitigation requirements, and potential sites are discussed at Working Group meetings. Active Working Group resource agencies include FAA, USEPA, DMF, DEP, CZM, and NMFS, CBED.

Joint Working Group meetings were held in June and August 2010. As a result of the discussions held at these meetings, Massport reassessed its initial eelgrass mitigation strategy at the suggestion of the resource agencies. At the August meeting, a new eelgrass site selection survey methodology was presented and discussed. Resource agency support of the new methodology was received, and Massport moved forward with its current eelgrass mitigation strategy described in Chapter 5, *Proposed Mitigation and Section 61 Findings*.

At the December 2010 Working Group Meeting, Massport presented the results of the eelgrass mitigation site survey. The survey found that two sites, White Head Flats and Old Harbor, have highly suitable conditions for eelgrass restoration, and provide sufficient area for the proposed mitigation. Upon learning the recommendation for eelgrass mitigation, the Eelgrass Working Group recommended that Massport transplant eelgrass directly from the Runway 33L area to White Head Flats prior to the start of construction, and that the intermediate step of test plantings should be omitted.

Massport anticipates holding additional meetings with the Eelgrass Working Group for continued coordination during the permitting process.

7.3.3 Section 7 Consultation

The FAA and NMFS completed a Section 7 Consultation under the Endangered Species Act (ESA). In its letter dated March 24, 2010, NMFS indicated that three species of threatened or endangered sea turtles and three species of endangered whales may be found in Massachusetts waters.⁵ Due to the nearshore location of the

⁵ Letter received from the National Marine Fisheries Service, dated March 24, 2010.



Project, it is unlikely that the whale species would be present, but it is possible that sea turtles could be present in the Project area. The FAA made a preliminary determination that the proposed pile-supported deck is not likely to adversely affect any threatened or endangered species listed under the jurisdiction of NMFS.^{6, 7} NMFS concurred with the FAA's determination, and indicated that the ESA Section 7 Consultation is complete.⁸

⁶ Letter to National Marine Fisheries Service from the Federal Aviation Administration, dated March 22, 2010.

⁷ Vanasse Hangen Brustlin, Inc. Assessment of Sea Turtles and Whale Presence within the Boston Harbor Technical Memorandum, dated February 12, 2010.

⁸ Comment letter on the Draft Environmental Assessment/Environmental Impact Report received from the National Marine Fisheries Service, dated July 26, 2010.



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Distribution List

FAA *Order 5050.4B* states that airport development will likely trigger public interest. Distributing an Environmental Assessment (EA) to the public is the best way to provide the public with the information needed to formulate an opinion. FAA *Order 5050.4B, Paragraph 804*, requires distribution to the federal agencies having jurisdiction by law or regulation over the action and to the public for review.

In accordance with Section 11.16 of the MEPA regulations (301 CMR 11.00), the Massachusetts Port Authority (Massport) is distributing this Final EA/EIR to the following federal, state, and local agencies and interested parties.

It is our understanding that this document will be noticed in the *Environmental Monitor* published on February 9, 2011 commencing the 30-day public NEPA and MEPA review period. Therefore, comments on the Final EA/EIR are due by March 11, 2011.



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Appendix 1

Draft Finding of No Significant Impact



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**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 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 period commencing with the publication in the *Environmental Monitor* of the availability of the Environmental Assessment to which this draft FONSI is attached. Comments on the draft FONSI should be directed to the attention of Richard Doucette, Environmental Program Manager, FAA.

**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 **Runway Safety Area Improvements Project**. The purpose of the project is to increase safety for aircraft, passengers and crew in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R at Logan Airport consistent with the Federal Aviation Administration's (FAA) design standards.

The proposed safety improvements include:

- Constructing a 600-foot long RSA at the Runway 33L end with EMAS. The majority of the RSA will be on a 470-foot long by 303-foot wide pile-supported deck.
- Constructing a 500-foot wide Inclined Safety Area (ISA) at the Runway 22R end.

Massport also proposes to construct a new taxiway connection between Runway 33L and Taxiway C, referred to as the Taxiway C1 Connector, as well as relocate the perimeter road. Other connected actions described in the Environmental Assessment include relocating the Runway 15 localizer to the end of the pile-supported deck, and installing the infrastructure for the instrument landing system, the operational aspects of which were reviewed as part of the Airside Improvements Project EIS and approved in the FAA's Record of Decision.

Federal actions include federal funding decisions for any portion of this project and approval of the 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. This EA incorporated an Environmental Impact Report (EIR) in accordance with the provisions of the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations.

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

Alternatives Considered

The EA/EIR included a review of alternatives to the proposed action. The alternatives for the Runway 33L end (detailed in pages 2-1 to 2-13) included shortening Runway 15R-33L; shifting the runway thresholds; constructing a 1000-foot long by 500-foot wide RSA on a solid fill structure or a pile-supported deck; constructing a 600-foot long by 500-foot wide RSA with EMAS on a solid fill structure or pile-supported deck; and constructing a 600-foot long by 300-foot wide RSA with EMAS on a pile-supported deck.

The alternatives for the Runway 22R end (detailed in pages 2-13 to 2-18) included EMAS enhancement on a solid fill structure; EMAS enhancement on a pile-supported deck; EMAS replacement using 80-psi strength blocks in the current configuration; and an inclined safety area.

The outcome of this planning process was that Massport and FAA determined that the proposed action would maintain runway utility, provide an acceptable level of safety that meets the RSA design criteria, and would have the least adverse environmental impact (EA/EIR, page 2-32).

Assessment

The proposed safety improvements are required to enhance the RSAs, to the extent feasible, to be consistent with the FAA's current 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 currently end 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 Airport Design Advisory Circular,¹ to the extent feasible.

The project was evaluated in a combined state/federal document, **Final Environmental Assessment/Environmental Impact Report/, EOEEA No. 14442, January 2011**. Pages 4-1 through 4-78 provide a review of the impact of the proposed projects across 23 categories of concern in accordance with the requirements of NEPA. The report was accepted as a Federal document by the FAA on January 31, 2011. On March 18, 2011 the Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs issued a Certificate finding the FEIR "adequately and properly complies with the Massachusetts Environmental Policy Act." (MEPA)

Consistency with Community Planning

The enhancement of safety at Logan International Airport is fully consistent with all local, state and community planning.

¹ United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

Mitigation Measures

The proposed action includes mitigation for unavoidable impacts to salt marsh, mud flats, and submerged aquatic vegetation. The Sponsor has committed to provide the following mitigation measures, as detailed in the Final EA/EIR on pages 5-1 through 5-50:

- Restoration of 4.6 acres of submerged aquatic vegetation (eelgrass) at up to two locations in Boston Harbor (for Runway 33L);
- Additional in-situ eelgrass restoration, if post-construction surveys identify additional impacts due to construction equipment (for Runway 33L);
- Post-construction monitoring of mussel beds and pilings at Runway 33L;
- Restoration of 1.6 acres of salt marsh, at a site in the Rumney Marsh in Saugus, MA (for Runway 22R); and
- Restoration of 1.4 acres of intertidal mud flat, at a site in the Rumney Marsh in Saugus, MA (for Runway 22R).

Sponsor 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 the National Environmental Policy Act of 1969 (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:

Richard Doucette,
Environmental Program Manager

Date

DISAPPROVED:

Richard Doucette,
Environmental Program Manager

Date



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Appendix 2

MEPA Documentation

- Secretary's Certificate on the Draft Environmental Impact Report, September 29, 2010, and Responses
- Secretary's Certificate on the Environmental Notification Form, July 8, 2009



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Secretary's Certificate on the Draft Environmental Impact Report



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The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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 Boston, MA 02114

Deval L. Patrick
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September 29, 2010

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

PROJECT NAME : Boston-Logan International Airport Runway Safety Area
 Improvements Project
 PROJECT MUNICIPALITY : East Boston
 PROJECT WATERSHED : Boston Harbor
 EOE A NUMBER : 14442
 PROJECT PROPONENT : The Massachusetts Port Authority
 DATE NOTICED IN MONITOR : July 21, 2010

As Secretary of Energy and Environmental Affairs, I hereby determine that the Draft Environmental Impact Report (DEIR) submitted on the above project **adequately and properly** complies with the Massachusetts Environmental Policy Act (G. L., c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00). The Scope for the Final Environmental Impact Report (FEIR) provided below outlines the remaining issues.

Project Overview

The proposed project consists of enhancing the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport. The proposed improvements are required to enhance the RSAs to be consistent with the current Federal Aviation Administration's (FAA) airport design criteria for RSAs and to enhance rescue access in the event of an emergency. RSAs are safety measures designed exclusively to function in the event of an undershoot, overshoot or excursion from the runway. RSAs do not extend runways or have any effect on normal runway operations, runway capacity or types of aircraft which can use the runways. Typical RSAs are 1,000 feet long by 500 feet wide.

The existing RSA at the end of Runway 33L does not meet standard FAA design criteria for overrun and undershoot protection for the design aircraft for that runway, the Boeing 747-400. The existing RSA is 187.5 feet long and 500 feet wide and is therefore too short to provide protection consistent with FAA criteria. Within this area is a 158-foot long and 170-foot wide Engineered Material Arresting System (EMAS) bed constructed of collapsible concrete blocks with predictable deceleration forces, installed in 2006 as an interim safety measure. When an aircraft rolls into an EMAS bed, the tires of the aircraft collapse the lightweight concrete and the aircraft is slowed down in a way that minimizes damage to the aircraft. The proposed project is intended to enhance the Runway 33L RSA so that it provides overrun and undershoot protection consistent with the design criteria in the FAA's Airport Design Advisory Circular to the extent feasible.

The existing RSA at the end of Runway 22R meets the minimum FAA design criteria for overrun protection for the runway's design aircraft but does not comply with undershoot requirements. However, given that Runway 22R is very rarely used for arrivals and has an 815-foot displaced threshold, it is unlikely that aircraft would ever undershoot this end of the runway. Therefore, the Runway 22R RSA enhancement is intended to protect aircraft in the event that an aircraft arriving on Runway 4L overruns and fails to stop on the runway. The RSA is 215 feet long and 500 feet wide, and includes a 190-foot long and 170-foot wide EMAS bed. As a condition of approving the installation of the existing EMAS bed, the FAA required Massport to consider options for further enhancing the level of safety provided by the existing RSA. The current project proposal is consistent with that commitment.

As proposed, the two components of this project will have significant and permanent impacts upon coastal wetlands, salt marsh, and shellfish beds. While Massport is working to minimize adverse impacts, there are still unavoidable permanent impacts to coastal wetlands. At Runway End 22R, Massport is proposing to fill coastal bank (530 linear feet (LF)), salt marsh (35,040 square feet (SF)), coastal beach (26,630 SF), land containing shellfish (1.4 acres or 62,370 SF), land under ocean (700 SF) and Buffer Zone to create an Inclined Safety Area. At Runway End 33L, Massport is proposed to construct a pile-supported deck over coastal bank (395 LF), coastal beach (4,385 to 4,570 SF), land containing shellfish (460 SF to 1,175 SF), land under the ocean (395 to 1,045 SF) including 1.4 to 1.5 acres (60,100 to 66,600 SF) of eelgrass bed, and Buffer Zone (not quantified) to extend the existing EMAS. Also, fish and shellfish habitat would be displaced, altered or eliminated by the pilings for Runway 33L, and approximately 62,370 square feet of Land Containing Shellfish will be lost due to the placement of fill as part of Runway 22R safety improvements.

Comments submitted on the DEIR generally support the project and its public safety purposes. After reviewing the DEIR and the comments received, I find that Massport has adequately demonstrated that the project's preferred alternatives appropriately minimize environmental impacts to the greatest extent possible, subject to further refinement of design-alternatives for the Runway 33L deck construction and piling combinations in the FEIR. However, the FEIR needs to contain a greater level of detail and commitment to mitigation

measures for the unavoidable environmental impacts associated with the preferred alternatives. The FEIR should fully respond to comments submitted on the DEIR and to the Scope provided below.

State Permits and Jurisdiction

This project is subject to a mandatory EIR pursuant to Section 11.03(3)(a)(2) of the MEPA regulations because it involves Agency Action and will result in wetland alterations that require a Variance in accordance with the Wetlands Protection Act. The project will require a 401 Water Quality Certificate and a Chapter 91 License from the Department of Environmental Protection (MassDEP). The proposed project may also require approval from the Massachusetts Natural Heritage and Endangered Species Program. To initiate public review under the state wetlands regulatory process, Massport has filed a Notice of Intent (NOI) with the Boston Conservation Commission to obtain an Order of Conditions pursuant to the Wetlands Protection Act (WPA). However, I note that the Wetland regulations, 310 CMR 10.23(3) does not allow salt marsh alteration or allow for any adverse effects on marine fisheries habitat or wildlife habitat caused by destruction of eelgrass beds, 310 CMR 10.25(6)(b). Massport has requested a Variance to the Wetlands Protection regulations to allow the proposed salt marsh and eelgrass alteration. Review of the Variance request has been suspended pending completion of the MEPA process and submission of additional information.

In addition, both the proposed RSA enhancements for Runway 33L and Runway 22R will require fill materials to be placed below the extreme high water line. Therefore, an Individual Section 10/ 404 permit from the U.S. Army Corps of Engineers (USACE) is required. The authority for these permits is Section 10 of the Rivers and Harbors Act for any structures or work within tidal waters up to mean high water and Section 404 of the Clean Water Act for placing fill or dredged material up to the extreme high water line or within adjacent wetlands. The proposed project may also be subject to Coastal Zone Management (CZM) federal consistency review, in which case the project must be found to be consistent with CZM's enforceable program policies. The project must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site.

The project will be undertaken by Massport, a State Agency, and financed in part by funds from the Commonwealth. Therefore, MEPA jurisdiction for this project is broad and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Joint Review/Working Groups

The FAA determined that the proposed project required an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). It is my view that the planning for this project has been served well by the coordinated review and the submission of a single set of documents to satisfy the requirements of both MEPA (Section 11.09(4)(c) and NEPA.

Therefore, I continue to allow the proponent to submit one set of documents that satisfies both the state and federal environmental processes for the Final EIR/EA process.

Massport established two working groups to discuss avoidance and minimization of impacts to coastal wetland resources, and ultimately mitigation options, as conceptual design of the proposed Runway 33L and Runway 22R Runway Safety Area improvements advanced. These Working Groups included local, state, and federal resource agency representatives, and met multiple times from April 2009 to June 2010 to provide advice and regulatory guidance to Massport regarding impacts and mitigation. I advise Massport that coordination with the Working Groups should continue through the Final EIR/EA and permitting processes, consistent with the Scope provided below.

A-1

REVIEW OF THE DEIR/SCOPE

Format and Circulation

The proponent should prepare and circulate the Final EIR (FEIR) in accordance with Sections 11.07 of the MEPA regulations, as modified by this Certificate. The FEIR should contain a copy of this Certificate and of each comment letter received. The proponent should circulate the FEIR in compliance with Section 11.16 of MEPA regulations, to those parties submitting written comments on the ENF, and to any state agencies from which the proponent will seek permits or approvals. The proponent should send a Notice of Availability of the FEIR to Massport’s standard MEPA mailing list, as periodically updated. The proponent should also make a reasonable number of copies of the FEIR available on a first come, first served basis. A copy of the FEIR should be made available for public review at the Boston Public Library (East Boston Branch), the Revere Public Library, the Chelsea Public Library, the Everett Public Library and the Winthrop Public Library.

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A-5

As noted previously in my Certificate on the Environmental Notification Form, because there will be potential impacts to shellfish, the FEIR should be distributed to the shellfishing industry and local shellfishing representatives. I have received several comments requesting enhanced outreach to the local shellfishing industry to ensure they are afforded an opportunity to participate in the environmental impact review process for this project. I ask that Massport commit to holding a briefing with local shellfishing representatives during the preparation of the FEIR to discuss potential impacts associated with the project. I suggest that Massport contact The Boston Harbor Association and/or the Division of Marine Fisheries to help facilitate that meeting. If those discussions have already taken place, the FEIR should describe the outreach to the shellfishing community and the outcome of the discussions in greater detail.

A-6

Response to Comments

In order to ensure that the issues raised by commenters are addressed, the FEIR should include a detailed response to comments. The FEIR should include a Response to Comments

A-7

section which reprints comments in their entirety. The FEIR should include responses to individual comments, in an indexed format and/or direct response to individual points within comment letters. This directive is not intended to and shall not be construed to enlarge the scope of the FEIR beyond what has been expressly identified in this Certificate.

A-7
cont'd.

Alternatives Analysis

Runway 33L

The Preferred Alternative for the Runway 33L Runway Safety Area (RSA) improvements includes constructing a 600-foot long RSA with Engineered Materials Arresting System (EMAS) on a 300-foot wide pile-supported deck. The deck, extending over the water, would be 470 feet long. The Preferred Alternative also includes moving the existing offset localizer to a new pile-supported deck at the end of the RSA, and upgrading the approach light system to a Category III Instrument Landing System (Cat III ILS) which includes a High-intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2). Part of the existing timber light pier (approximately 560 feet) would be removed and the approach lights would be incorporated into the new deck. The existing EMAS bed would be extended to a total length of 500 feet. As part of this alternative, the existing 20-foot wide airport perimeter road would be relocated between the runway's threshold and the EMAS bed (it is currently located at the end of the existing EMAS bed). Emergency access ramps to the water would be installed on the north and south sides of the RSA and ladders or concrete steps would be provided on the sides and end of the RSA.

While the Preferred Alternative for Runway 33L RSA improvements would result in impacts to coastal wetland resources, including Coastal Bank, Coastal Beach, Land Under the Ocean, and Submerged Aquatic Vegetation (eelgrass), impacts from this alternative are less than that proposed for the three preliminary alternatives previously evaluated in the Environmental Notification Form (ENF). The Preferred Alternative would maintain runway utility and capacity, and would provide protection and functionality near equivalent to a RSA that fully meets the FAA design criteria. Massport and FAA retained this alternative based on the safety benefits achieved, reduced environmental impacts, and cost feasibility.

However, with respect to specific final design of the pile-supported deck, Massport has considered various pile types and configurations. Five of six construction options are considered in detailed in this DEIR. These alternate deck structures and piling combinations were evaluated at the conceptual design level to assess costs, minimize impacts, and evaluate constructability. Because the overall impacts of the different deck and piling configurations to coastal wetlands resources and coastal processes would be similar, all five options were retained to provide flexibility in the design-build process.

To summarize, all five deck and pile options would contain the following elements:

- A RSA approximately 600 feet long by 300 feet wide located partially on land and partially on the proposed deck with various pile supporting options.

- A deck structure approximately 470 feet long, with a surface area of approximately 141,000 square feet (3.2 acres);
- An EMAS bed approximately 500 feet long by 170 feet wide located within the RSA;
- Two 25-foot wide emergency access ramps located approximately 30 feet northeast and 70 feet southwest of the proposed deck protected by riprap placed around the edge of the ramps;
- A steel sheet pile cutoff wall approximately 350 feet long at the inshore limit of the deck to prevent settlement and erosion of the backland areas;
- A new deck to support the localizer, approximately 300 feet wide by 60 feet long, supported by thirty-three 16-inch diameter vertical piles;
- Finger pier extensions to the existing light pier to accommodate a lighting upgrade; and
- Relocating the existing perimeter road, utilities, and a portion of Taxiway C.

Massport may carry-forward the preferred alternative for Runway 33L and the remaining five design options for the pile-supported deck for further analysis in the FEIR.

Runway 22R

The proposed Runway 22R improvements enhance the existing RSA by constructing an inclined safety area (ISA). This Preferred Alternative was advanced to the conceptual design phase because it would enhance the existing RSA and rescue access in the event of an emergency, at a construction cost which appears to be feasible while minimizing impacts to environmental resources.

The proposed Runway 22R ISA would be similar to the ISA previously constructed at the Runway 22L end. It would require gravel fill to be placed approximately 130 feet north from the top of Coastal Bank and would be graded over the full 500-foot width of the extended safety area down to the mean lower low water elevation. The proposed Runway 22R ISA would include placing approximately 8,450 cubic yards of fill, contained within a perimeter wall of stone-filled gabions and surfaced with crushed stone. Emergency access ramps would not be required because the ISA itself would provide first responders with access between the water and the airfield. The perimeter road would not be relocated.

Massport may carry-forward the preferred alternative for Runway 22R for further analysis in the FEIR.

Wetland Resources

Impacts Associated With Runway 33L

The proposed Runway 33L RSA improvements would affect coastal wetlands resources of approximately 3.65 acres. The proposed Runway 33L safety improvements would result in permanent impacts to Coastal Bank, Coastal Beach/Tidal Flats, Land Containing Shellfish, Submerged Aquatic Vegetation (eelgrass), and Land Under the Ocean. A portion of this area is also defined as waters of the United States, and is subject to federal jurisdiction. There is a state-

jurisdictional buffer zone extending 100 feet from the top of Coastal Bank. Work proposed within the buffer zone includes removing a segment of the existing perimeter road (which will be relocated outside of the buffer zone) and converting that area to grass. Work within the buffer zone also includes reconstructing the existing EMAS bed. The hydrological analysis described in the DEIR indicates that the proposed pile-supported deck would not change coastal currents or wave impacts in the vicinity of the Runway 33L RSA.

Each of the proposed Runway 33L deck construction options would result in the alteration of 315 linear feet of the man-made Coastal Bank to install the sheet piling and fill structure that would support the approach slab and landward end of the RSA deck. An additional 80 linear feet of the riprap slope would be altered for the emergency access ramps. This would convert the existing rip-rap bank to a sheet pile bank or crushed stone ramps, and would not affect the functions or significant interests of the Coastal Bank including storm damage prevention and flood control. The new sheet pile bank would maintain the stability of the Coastal Bank.

Each of the proposed Runway 33L construction options would also result in the alteration of Coastal Beach (the intertidal beach), ranging from 65 square feet (Option 3) to 250 square feet (Option 1), to install the fill structure that would support the approach slab and landward end of the RSA deck, and to install some of the deck pilings. An additional 4,320 square feet of Coastal Beach would be converted to two emergency access ramps.

The proposed Runway 33L RSA improvements would affect Land Under the Ocean, especially the protection of marine fisheries and wildlife habitat. Each of the construction options would result in the loss of Land Under the Ocean to install pilings needed to support the RSA deck (including the localizer). The area of loss is directly related to the size and number of pilings, and ranges from 395 square feet (Option 3) to 1,045 square feet (Option 5). Eelgrass (submerged aquatic vegetation) is a habitat type of the state-regulated Land Under the Ocean, and is also considered to be a Special Aquatic Site under the federal Section 404(b)(1) guidelines. The DEIR assumes that the entire portion of the eelgrass bed under the proposed Runway 33L deck would be shaded and would no longer receive sufficient light to survive. It is conservatively estimated that this would result in the loss or impairment of 60,100 square feet of eelgrass due to direct shading from the proposed deck (approximately 3 percent of the entire existing eelgrass bed), as this area would not receive enough light for eelgrass survival. An additional 6,500 square feet of eelgrass near the deck is expected to be indirectly affected by shading, although this is less certain. Each of the deck construction options would result in the same impacts to eelgrass, since the size of the RSA (and localizer) deck would be the same under all five construction options.

Each of the proposed Runway 33L construction options would also result in the alteration of Land Containing Shellfish (a state-regulated resource area that overlays Coastal Beach and Land Under the Ocean) as a result of placing pilings to construct the RSA improvements. Direct impacts range from 460 square feet (Option 3) to 1,175 square feet (Option 5).

Impacts Associated With Runway 22R

The proposed Runway 22R safety improvements would result in permanent impacts to Coastal Bank, Salt Marsh, Coastal Beach, Land Under the Ocean, Land Containing Shellfish, and Land Subject to Coastal Storm Flowage. A portion of this area is also defined as waters of the United States, and is subject to federal jurisdiction. There is a state-jurisdictional buffer zone extending 100 feet from the top of Coastal Bank. There are no permanent impacts to this buffer zone, which contains the perimeter road and a portion of the existing Runway 22R EMAS bed. The DEIR states that the ISA is not expected to change wave direction or velocity or to result in increased erosion or deposition because of its orientation.

The proposed Runway 22R ISA improvements would result in the alteration of 530 linear feet of Coastal Bank in order to construct the ISA. The DEIR states that the proposed ISA would maintain or improve the stability of the bank. Approximately 26,630 square feet of Coastal Beach/Tidal Flat would be lost due to the construction of the Runway 22R ISA. The DEIR states that it is not likely to impact any adjacent or downdrift Coastal Beach and will not interfere with littoral drift. Approximately 35,040 square feet of Salt Marsh (including 7,110 square feet of *Phragmites*-dominated Salt Marsh) would be lost due to the construction of the Runway 22R. The proposed Runway 22R ISA would impact the interests significant to Salt Marsh, and therefore, requires a WPA Variance because work would not meet the regulatory performance standards described in the WPA.

Approximately 700 square feet of Land Under the Ocean would be lost due to the placement of fill required to construct the inclined safety area. There are no eelgrass beds located within the proposed Runway 22R ISA improvements area. The proposed Runway 22R ISA improvements would have no adverse effects on marine fisheries and wildlife habitat protected by Land Under the Ocean, as high densities of polychaetes, mollusks, or macrophytic algae are not present in the vicinity of Runway 22R. Approximately 62,370 square feet of Land Containing Shellfish would be lost due to the placement of fill required to construct the inclined safety area. The proposed Runway 22R would affect the interests significant to Land Containing Shellfish mapped by the DMF as a conditionally restricted designated shellfish growing area.

With respect to quantification of impacts to the various wetland resource areas and types, I have received comments requesting clarification of discrepancies between the information provided in narratives and attached tables. I ask that Massport address these comments and clarify the correct numbers concerning the extent of impacts.

A-8

Variance from the Wetlands Protection Act (WPA)

Because of the extent of wetlands impacts outlined above, this project will require MassDEP to issue a Variance from the WPA Regulations. In order to grant a Variance request, section 310 CMR 10.05 of the regulations requires MassDEP to consider three main criteria: 1) that there are no reasonable conditions or alternatives that would allow the project to proceed in

A-9

compliance with the wetlands regulations; 2) that mitigation measures are proposed that will allow the project to be conditioned so as to contribute to the protection of the interests identified in the Wetlands Protection Act; and 3) that the variance is necessary to accommodate an overriding community, regional, state or national public interest, or to avoid an unconstitutional taking of property without compensation. The FEIR should clearly describe how the project will comply with these requirements.

A-9
cont'd.

While the DEIR contained information and plans related to both runways, as described above, MassDEP has stated in its comments that the information required for consideration of a request for a Wetland Protection Act Variance has not been developed in sufficient detail for MassDEP to adequately review the variance request. Therefore as part of the FEIR, Massport should submit design-level plans depicting resource area impacts and mitigation in greater detail, as well as include detailed construction and operational specifications. I refer Massport to MassDEP's comment letter for further details on the information that will be required.

A-10

The majority of the information that needs to be provided in the FEIR concerning impacts to wetland resource areas concerns mitigation. The DEIR contained an analysis of the on-site mitigation options for wetland alterations. The DEIR also addressed the possibility of off-site mitigation if on-site mitigation is infeasible. The FEIR should contain further analysis for proposed mitigation sites and well as refined mitigation goals, based on public and agency feedback. MassDEP has stated in its comments that detailed mitigation design plans and specifications should be addressed in the FEIR for impacts to land under water (310 CMR 10.25), eelgrass beds (310 CMR 10.25(6)(b)), and salt marsh (310 CMR 10.32) discussed in detail below.

A-11

Land Under Water/Intertidal Areas

The DEIR did not clarify enough what is intended to be provided as mitigation for impacts to land under water/intertidal areas. I have received several comments requesting that Massport specifically identify what mitigation measures are associated with impacts to land under water/intertidal areas and mudflats/coastal beach. It is not clear whether salt marsh restoration will adequately compensate for the functions and values associated with these specific resource areas, and that topic should be addressed in the FEIR. I note that impacts to shellfish and aquatic habitat associated with these resource areas are addressed separately below.

A-12

A-13

Eelgrass

Massport should strive to minimize impacts to eelgrass in the Preferred Alternatives. The FEIR should identify, in consultation with the Eelgrass Mitigation Working Group and environmental and community representatives, the site of eelgrass re-establishment/restoration at a minimum of a 3:1 ratio, or higher. The FEIR should include a detailed protocol in order to achieve the required level of eelgrass mitigation and how Massport intends to choose suitable transplant sites. As requested in MassDEP's comments, the FEIR should include:

A-14

A-15

- Information on the collection of field data and the undertaking a site-selection modeling effort (as outlined in the VHB Memo Re: Logan RSA – Eelgrass Mitigation Strategy, dated August 16, 2010); A-16
- An updated map of the aerial extent and density of eelgrass habitat in the project area conducted during the growing season prior to construction; A-17
- The final estimates of direct eelgrass impacts from the project and indirect impacts from shading, sediment deposition outside of the footprint, changes in sediment distribution from alterations in water circulation, and anticipated impacts from construction barges; A-18
- If vessels are to be anchored in eelgrass beds, a discussion of how “anchor sweep” impacts to eelgrass beds will be avoided or minimized; if impacts cannot be avoided, the effects of the anchor sweep need to be calculated and mitigation provided; A-19
- A schedule to minimize and/or eliminate the risk of impacts from construction vessels (e.g. limiting barge use to periods of high tide to avoid grounding of barges on eelgrass habitat and the use buoys to mark construction corridors to contain vessels movements); A-20
- Documentation that the proposed eelgrass mitigation plans are consistent with methodologies critical to the success of eelgrass restoration efforts; A-21
- A discussion and assessment of the potential eelgrass sites (including the Deer Island Flats and Governor’s Island Flats) identified by the Batelle study conducted as part of the HubLine project and how the findings of this study may assist Massport in choosing suitable transplant sites; A-22
- A survey of any other sites in the outer harbor not assessed in the Batelle study with appropriate physical and biological site characteristics that optimize eelgrass survival; A-23
- A discussion of how the eelgrass plant stock in the footprint of the construction area will be preserved for used as donor stock (i.e. harvested, transported, and transplanted – including possible transplanting into the less dense portion of the existing bed beyond the impacted area) and a timetable of the sequencing steps to ensure optimal eelgrass survival and transplanting success; A-24
- A commitment to pre-construction and long term post-construction monitoring of any proposed mitigation site; A-25
- Documentation from the U.S. Department of Agriculture - Wildlife Services as to whether eelgrass habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and whether a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139; A-26
- A monitoring plan to track the success of all eelgrass transplant efforts and the criteria (e.g. root/shoot density comparable to the existing eelgrass meadow and the targeted percent of re-established cover over a one, three, and five-year timeframe) to be used to measure the success of the restoration effort; and A-27
- Remedial plans to be undertaken in the event that initial restoration efforts fail. A-28

I note that comments from CZM raise the possibility of providing out-of-kind mitigation for impacts to eelgrass because of the poor historical track record for eelgrass transplanting and restoration. I agree with CZM that contributions to alternative types of mitigation strategies

should at least be included in the ongoing discussions about mitigation. I ask that both Massport and the Eelgrass Mitigation Working Group strive to develop a mitigation strategy with the greatest possible benefits to eelgrass habitat in both Boston Harbor and beyond.

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cont'd.
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Salt Marsh

Massport should continue to further refine the Preferred Alternatives in an effort to minimize adverse impacts to the flora and fauna to the maximum degree possible. Because of bird hazard risks, the DEIR states that off-site, rather than on-site, mitigation of salt marsh impacts will be pursued. In the DEIR twelve sites are recommended for further review as potential mitigation sites. Seven of these sites are within Rumney Marsh Reservation. I remind Massport that for all mitigation, the expectation remains that the FEIR will include a short list of viable mitigation sites.

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To compensate for adverse impacts to salt marsh resources which cannot be avoided, the FEIR should contain no less than a 2:1 ratio or higher ratio for emergent wetlands, with first priority for the restoration or re-establishment of existing wetlands, and a higher mitigation ratio, which should be determined by the Salt Marsh Mitigation Working Group, if enhancement of other salt marsh is required. In order to achieve at least the 2:1 salt marsh replacement ratio, the FEIR should document the protocol for how Massport intends to choose and develop suitable replication sites. As requested by MassDEP, the salt marsh replacement plans should include:

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- Plan views, cross-sections, final planting plans, and a monitoring plan;
- The size and location of the existing and replicated wetland, at a scale in the range of 1"=10' to 1" = 40", and shall include easily identifiable landmarks such as surveyed flag locations, benchmarks, or structures;
- Contour lines at 2' intervals for existing areas and 1' intervals for proposed areas;
- Sufficient number of spot elevations to describe the topography of the wetland and the surrounding area including grade elevations below the highest spring tides of the year with portions below mean high tide
- The locations of soil test pits and vegetation plots;
- Cross-sections of the existing and proposed wetland subsurface, showing soil types, depths, and locations using both horizontal and vertical scales;
- Documentation that a minimum replacement area ratio of 2:1 be located in the same general area or water body as the area lost, unless a determination is provided from the U.S. Department of Agriculture - Wildlife Services that salt marsh habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139;
- Locations that are not tidally restricted by any pipe, culvert, bridge, roadway or other development and not colonized by invasive species;
- Internal sloped drainage creeks with suitable depths to provide killifish habitat; and
- Provisions for assessments of potential contamination if the proposed salt marsh

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restoration sites containing dredged spoils;

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MassDEP has indicated in its comments that depending on project specifics, proposed salt marsh restoration mitigation that involves the enlargement, removal, or replacement (with tide gates) of culvert tidal restrictions may be acceptable for meeting some portion of the salt marsh mitigation requirement.

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I note that several comments support the idea of expanding the list of potential mitigation sites presented in the DEIR to include the possibility of in-lieu contributions to supplement funding of the on-going Broad Meadows project in Quincy. It is not clear whether the Broad Meadows project would provide mitigation for impacts to salt marsh, for impacts to land under water, or both. The FEIR should include an update on these discussions and clarify the specific impacts that would be mitigated. I recognize that the viability of the in-lieu fees for mitigation is dependent on the final determination of the U.S. Army Corps of Engineers concerning the acceptable parameters for in-lieu fee contributions. MassDEP has stated that if Broad Meadows is deemed to constitute satisfactory mitigation, further consideration would be required for compensation of intertidal and shellfish impacts. Shellfish mitigation plans, as discussed below, should be further refined in the FEIR to specify terms and procedures for the harvest and transplant of shellfish.

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Waterways and Tidelands Impacts

The Preferred Alternatives for safety improvements to Runways 22R and 33L include proposed changes on both filled and flowed tidelands. Pursuant to 310 CMR 9.03(3)(b), no MassDEP authorization is required for Massport activities on filled tidelands at Logan Airport. However, portions of the proposed RSA enhancements seaward of the mean high water line (flowed tidelands) would require a Chapter 91 license. Although the proposed RSA improvements would involve work in Chapter 91 waterways and tidelands, the DEIR states that there are no significant impacts to the public’s interests in these tideland areas. The only interests currently provided by the proposed RSA Project Sites are shellfishing, living marine resources, and water quality. Limited shellfishing will continue to be permitted within the Security Zone, in those areas that have historically supported that activity.

Runway 33L

The proposed RSA improvements for this runway would have permanent impacts to waterways and tidelands. Although the physical loss of tideland (based on the footprint of the area of natural substrate replaced by pilings) varies slightly among the proposed deck/piling options, the options would result in the same deck footprint. The DEIR states that the affected Chapter 91 resources are therefore considered to be the area of the deck footprint seaward of the mean high tide line, approximately 159,000 square feet (3.65 acres) and extending approximately 470 feet seaward of the high tide line.

Runway 22R

The proposed Runway 22R ISA improvements would have permanent impacts to waterways and tidelands. An area of approximately 1.4 acres below the mean high water line would be affected due to the construction of the ISA, a nonwater-dependent use. No public access is currently allowed within the proposed Project area. Limited shellfish harvesting by licensed clammers is allowed within the Security Zone with prior notice from DMF.

Licensing Requirements

MassDEP has determined that the portions of the proposed project subject to Chapter 91 jurisdiction are considered to be nonwater-dependent uses, since airports do not require direct access to tidelands. This finding is particularly significant in this instance since new fill and structures for nonwater-dependent use are generally prohibited seaward of the mean high water mark [310 CMR 9.32(1) (a)]. While there are limited exceptions to this prohibition which allow placement of fill in some cases, according to MassDEP, they do not appear to be applicable to the proposed fill at Runway 22R. MassDEP has further indicated that the pile-supported structure for nonwater-dependent use proposed at the end of Runway 33L is likewise prohibited by the Waterways regulations. The project may therefore require a Variance from the Chapter 91 performance standards.

MassDEP has stated that the DEIR is generally responsive in the context of the Chapter 91 variance provisions. The DEIR shows that there are no alternatives that allow the project to proceed in compliance with 310 CMR 9.00; that the project includes measures to minimize interference with public interests in waterways and has proposed mitigation to compensate for any remaining detriments to the public interest in tidelands; and has made a good argument that the project is necessary to accommodate an overriding regional/state/federal interest.

The areas in which work is proposed are not currently accessible to the public and would not be accessible to the public for the foreseeable future. These areas are within the state-legislated Logan Airport security zone restrictions on public access. This security zone extends 500 feet seaward of the high water mark. The substantive standards that MassDEP will use to evaluate the project are those related to Nonwater-dependent Infrastructure Facilities found at 310 CMR 9.55. Since public access is restricted at this site due to security concerns, MassDEP's review would concentrate instead on the resource impacts to salt marsh, eelgrass, and loss of shellfish habitat and adequate mitigation of those impacts in accordance with 310 CMR 9.55(1)(b-c). The FEIR should further refine the proposed mitigation plan in anticipation of the filing of the variance license application.

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Public Benefit Determination

In accordance with 301 CMR 13.03, the DEIR included information on how the project will meet the requirements for a positive Public Benefit Determination. The DEIR included information describing the nature of the tidelands affected by the project and the public benefit of the project, the purpose and effect of the project, the impact on abutters and the surrounding

community, enhancement to the property, benefits to the public trust rights in tidelands or other associated rights, environmental protection and preservation, public safety, and the general welfare. I acknowledge that the proposed project presents a somewhat unique circumstance where public access to tidelands is not possible. The FEIR should however address whether the project may be able to provide additional opportunities for access to tidelands for shellfishing in other locations, for example. The FEIR should also provide further information on the overall public benefits provided by the project since promoting access to tidelands is not appropriate.

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Fisheries Species and Habitat Resources

The DEIR provided a summary of the project site’s habitat assessment and identified the project’s impact to state-listed species.

Impacts at Runway 33L

Approximately 3.65 acres of habitat that could be used by fish species would be altered by the proposed Runway 33L pilings and shaded by the deck. The NMFS has designated Essential Fish Habitat (EFH) within marine, estuarine and freshwaters of the U.S. that includes Boston Harbor. The DMF has recommended a time of year restriction for in-water, silt producing work extending from February 15th through June 30th for the protection of winter flounder, one of the fish species for which Boston Harbor is designated as EFH. Winter flounder use near-shore areas for spawning, larval settlement, and juvenile development.

Impacts at Runway 22R

The Coastal Bank at this location is dominated by the invasive common reed (*Phragmites australis*). Wetlands were identified based on the presence of Salt Marsh grasses (*Spartina alterniflora* and *S. patens*) and common glasswort (*Salicornia europaea*). The proposed Runway 22R ISA would replace a portion of the Coastal Beach/Tidal Flat present at Runway 22R with a stone substrate. This would alter habitat for benthic organisms. A small amount of intertidal habitat that could be used by fish species (approximately 1.4 acres, including salt marsh and coastal beach) would be altered.

The proposed Runway 22R ISA would require the removal of salt marsh grasses present at the end of Runway 22R, to be replaced with gravel fill. A stand of common reed (*Phragmites australis*) at the Runway 22R end would also be removed. The removal of common reed and salt marsh vegetation eliminate areas of potential wildlife hazards within the FAA-designated Wildlife Hazard Area, because these are potential roosting sites for starlings and red-winged blackbirds and potential habitat for shorebirds, brant, and seagulls.

The DEIR also explained some of the habitat enhancements as a result of the project. However, the FEIR needs to contain a greater level of information on this topic than what was provided in the DEIR and should address the detailed issues raised from federal, state, and city agencies concerning impacts to shellfish and to shellfishing. DMF has stated that the impact of shade on the underlying shellfish may be significant due to potential changes in fish foraging behavior, shellfish food availability and potential increase in fouling invasive tunicates under the structure. DMF has recommended that the FEIR include a survey of other large piers in the area

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to better understand the condition of underlying shellfish and benthic habitats and information of what monitoring will occur of invasive species and colonization by mussels after the construction. I ask that Massport work with the mitigation working groups to discuss a methodology for further assessment of impacts to shellfish.

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The project site is part of a historically important area for Boston Harbor shellfishermen. The intertidal mudflats surrounding Logan Airport are part of shellfish area GBH5.3, conditionally restricted, available for commercial harvest. Several commenters have stated that in recent years, a number of shellfish beds near Logan Airport and the Town of Winthrop have reopened to shellfishing, thanks to a cleaner Harbor. DMF has indicated in its comments that the mudflats on the project site support commercially harvested shellfish beds including soft-shell clams (*Mya arenaria*) and blue mussels (*Mytilus edulis*). According to DMF, the area's average production, calculated with several years of data, is over 5,130 bushels of soft shell clams per year. In addition, DMF states that the site is favored by shellfishermen because of its wide intertidal flat, enabling access to harvestable area on smaller tides. The FEIR should include a detailed account of the expected impacts to shellfishing from the project, and should proposed mitigation for those impacts as appropriate. As noted above, the FEIR should address outreach efforts to those potentially affected in the shellfishing community.

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Rare Species

Review of the Massachusetts Natural Heritage Atlas indicates there is Priority Habitat in the Runway 33L RSA study area. Upland sandpiper (*Bartramia longicauda*), which is listed as endangered in Massachusetts, is known to occur in the large grassy uplands in the interior of the airfield. The DEIR included information indicating that the Massachusetts Natural Heritage and Endangered Species Program (NHESP) has stated that the proposed Project would not adversely affect the actual resource area habitat for upland sandpiper, a state-protected species.

The proposed Runway 33L RSA improvements would replace a portion of Coastal Beach/Tidal Flat, eliminating habitat for certain benthic organisms, but the pilings could provide attachment substrate for other benthic organisms. The DEIR indicates that USFWS has previously stated that there are no federally-listed or proposed, threatened or endangered species or critical habitat under its jurisdiction within the Runway 33L project area. Impacts to plants would include the loss of habitat (coastal beach and land under the ocean) for marine algae and eelgrass. The proposed Runway 33L RSA improvements are not likely to affect federally-listed whale species, including the North Atlantic right, the humpback, the fin, the sei, and the sperm whales, as the proposed RSA would be constructed in an area too shallow to be used by whales and none have been reported in the immediate vicinity of the proposed improvements.

Although sea turtles have never been reported in Boston Harbor, NMFS considers that sea turtles may be found seasonally in Boston Harbor. The proposed Runway 33L pile-supported deck could impact habitat potentially used by sea turtles, but there likely would be no direct impacts to the species. The five construction options would have a similar effect on eelgrass and

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therefore on sea turtle habitats. The proposed Runway 22R ISA would result in the loss of approximately 1.4 acres of intertidal habitat and 700 square feet of subtidal habitat that could potentially be used by sea turtles. The FEIR should discuss the loss of this habitat and substrate in the Project area.



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Water Quality Certification and Stormwater

Runway 33L

According to the DEIR, the proposed Runway 33L safety improvements would not generate pollutants or affect water quality. The existing and proposed EMAS bed would not be accessed by vehicles other than during an emergency, due to its composition. The DEIR states that runways, taxiways, and aprons are not sources of pollutants. Frequent sweeping of the paved portions of the site further reduces the quantity of sediments that are available for transport by stormwater runoff. All outfalls would continue to be regulated under the Airport's existing National Pollutant Discharge Elimination System (NPDES) permit. Stormwater sampling of the airfield outfalls is an ongoing requirement of the NPDES permit and would continue following the construction of the Runway 33L RSA improvements. Additionally, stone rip rap at these outfalls prevents erosion and sedimentation resulting from stormwater discharges. According to the DEIR, runoff from the perimeter roadway and portions of the existing Runway 33L RSA do not enter the closed drainage system and sheet flow across the rip rap slope into Boston Harbor. Massport has state that this overland sheet flow from the RSA and adjacent areas do not constitute regulated discharges under the NPDES permit.

All of the proposed Runway 33L deck construction options would have the same water quality impacts. The five construction options would have the same drainage system and potential effects on stormwater in the vicinity of Runway 33L. Stormwater runoff from the deck will be discharged via scuppers located beneath the deck at several locations to prevent erosive forces from disturbing sediment and impacting the receiving water. To comply with the regulatory requirement to improve existing condition, Massport proposes to install stormwater treatment units at an outfall adjacent to the work area. The proposed stormwater management system complies with the Massachusetts Stormwater Management Regulations.

Runway 22R

According to the DEIR, the proposed Runway 22R ISA would have no permanent impacts to water quality. No vehicles would operate on the proposed ISA, no new impervious surfaces and no new stormwater conveyance systems would be created and the proposed ISA would not result in any new discharge of untreated stormwater. There would be no change to the quality and quantity of stormwater runoff resulting because the proposed ISA is not an area with higher pollutant loading and would not generate permanent changes in total suspended solids (TSS).

Water Quality Certification

The Water Quality Certification application requires documentation of how the project meets the regulation requirements of 314 CMR 9.00 and the associated criteria for the evaluation of applications for discharge of dredged or fill material to salt marsh and land under water 310 CMR 9.06. State water quality standards contained in 314 CMR 9.00 and 314 CMR 4.00 would apply to the dredging that would be necessary to remove unsuitable substrate at the Runway 22R end, as well as to the potential temporary construction-period increases in sedimentation and turbidity from the construction activities at the ends of both the Runway 22R and 33L.

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Sediment sampling/ testing information and a discussion of dredge material disposal options was not provided in the DEIR and must be developed as part of the FEIR. Specifically, Section 4.3.7.3 (pg. 4-93) indicated that the sediment related to Runway 22R ISA “were sampled and subjected to both physical and chemical analysis in accordance with Massachusetts Water Quality Certification Regulation [314 CMR 9.00] and compared to NOAA’s Sediment Quality Guidelines.” However, results of the sampling were not included in the DEIR. In addition, the DEIR states in the Temporary Construction Impacts stated that “any turbidity created would be quickly dispersed by the tides; therefore, the effects from the temporary construction-related turbidity are negligible.” According to their comments, MassDEP does not consider “tide dispersion” as a Best Management Practices (BMPs) and will require a turbidity monitoring program during excavation/dredging of approximately 8,450 cubic yards of unsuitable material. MassDEP has also stated what the requirement of transporting dredged material on public roadways (314 CMR 9.7(5)) includes “no free liquid as determined by the paint filter test”. The FEIR should include results of the sediment analysis, reconsideration of turbidity control BMPs, and consideration of on-site dredged material dewatering.

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Stormwater

The Wetlands and 401 Water Quality Certification regulations, at 310 CMR 10.05(6) and 314 CMR 9.06(6), respectively, require compliance with ten Stormwater Standards to protect wetland interests. Unmanaged or improperly managed stormwater runoff causes detrimental effects to the interests protected in wetland resource areas including erosion, scour, sedimentation, changes to hydrology, changes to wetland plant communities, promotion of invasive plant species (e.g. Phragmites, an invasive plant species is now present at Logan Airport), and damaging effects to aquatic organisms including fin fish and shellfish. The velocity of the discharged stormwater is also of concern, since unchecked velocity may scour coastal beaches and lead to loss of aquatic plants, including the habitat aquatic plants provide to fin and shellfish.

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For the 33L RSA, Massport proposes to collect and discharge stormwater runoff directly to wetland resource areas without any recharge or water quality treatment, which may impair interests protected by the Wetlands Protection Act, including fin fish and shellfish. Measures must be proposed in the FEIR to comply with the ten Stormwater Standards. MassDEP has

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provided detailed comments on this subject that should be addressed in the FEIR including evaluation of Environmentally Sensitive Site Design (ESSD), such as including Low Impact Development (LID) measures. In addition, MassDEP has advised directing the runoff from the proposed deck to be recharged to groundwater because this will reduce velocity, volume, and scour effects, as well as freshwater impacts to the intertidal and tidal zones.

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Runway End 22R must also comply with the ten Stormwater Standards specified at 310 CMR 10.05(6)(k)(1) – (10) and 314 CMR 9.06(6). The DEIR only included a proposal to improve conditions at Outfall A-12 to reduce scour. Alternative measures must be included in the FEIR to meet the required Stormwater Standards. The FEIR must address the comments related to stormwater issues raised during the review of the DEIR.

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Underwater Archaeological Resources

The area under the current Logan International Airport was comprised of islands and mudflats throughout most of the historic period. The Massachusetts Board of Underwater Archaeological Resources (Board) has indicated in its record the occurrence of at least 32 shipwrecks in Boston Harbor during the period of 1738-1893. However, the Board has indicated that this project will have no adverse effect.

As described in the DEIR, there are no historic resources directly adjacent to the proposed Runway 33L RSA. The Build Alternative would not affect any known historic or archaeological resources. The Massachusetts Board of Underwater Archaeological Resources does not have any record of underwater archaeological resources in the project area and it is highly unlikely that a resource would be found during construction due to the type of construction and project location which are all on a previously-filled area. There will also be no change to the Runway 22R end that may cause an adverse effect to any known historical, archaeological, or cultural resource. The Massachusetts Board of Underwater Archaeological Resources does not have record of underwater archaeological resources in the project area and it is highly unlikely that a resource would be found because the Runway 22R ISA is located almost entirely landward of mean low water.

Construction

Water quality in the vicinity of the proposed RSA enhancement will be temporarily impacted by construction activities, particularly by dredging to remove unsuitable substrate materials. These activities could result in a temporary increase in suspended sediments the area of Boston Harbor in the immediate vicinity of the proposed work.

Coastal resources and benthic organisms in the immediate vicinity of the proposed RSA enhancement could also be temporarily impacted by short-term construction activities. The DEIR should discuss how construction would be under taken in a way that minimizes impacts to

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resources. Construction could also result in short-term increases in noise (from construction equipment) and air emissions from construction equipment.

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Although there are no permanent construction-period impacts, construction activities may have temporary effects on water quality from sedimentation; traffic and the transportation network in the vicinity of Logan Airport; noise that would affect area residents; and emission of air pollutants during the construction period.

Construction is likely to disturb benthic sediments in the water column and increase turbidity in the vicinity of operations. Runway 33L deck construction Options 5 and 6 are expected to generate excavated sediment and use drilling fluid during drilling of caissons. The DEIR states that barges would transport most of the required construction equipment, personnel, and materials. The only materials expected to be delivered by truck to the airport would be the EMAS blocks, concrete and asphalt. The DEIR states that Massport's agreement with the Contractor will specify that direct construction truck traffic access to the Runway 33L construction site be through the North Gate for the duration of construction. The project anticipates 56 additional construction truck trips per day associated with the proposed Runway 33L RSA improvements. If necessary, Massport has committed to modify contractor schedules and access routes to minimize impacts.

Water quality in the vicinity of the proposed Runway 22R ISA improvements will be temporarily affected by short-term construction activities, particularly due to the excavation and dredging required to remove unsuitable substrate materials and to place new stone fill. The DEIR states that the perimeter of the inclined safety area would be protected from erosion by the placement of gabions (partitioned, wire fabric containers filled with stone to form flexible, permeable structures for earth retention). Excavation of material within the intertidal zone would be completed during periods of low tide. The area would be surrounded by a siltation curtain/debris boom to contain and minimize any debris or siltation. The DEIR also states that the construction completed at the Runway 22R end would follow a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts. The gabions wrapped with filter fabric installed during construction would also act as a barrier to sediment releases and reduce resulting turbidity.

Unlike Runway 33L, construction of the proposed Runway 22R ISA would be primarily undertaken from the landside, as most of the materials and workers would arrive by truck. The majority of workers would be transported to the site by shuttle bus. The DEIR states that Massport has committed that the contractor for the proposed Runway 22R ISA would be under the same access restrictions for direct construction truck traffic access as the Runway 33L construction. Vehicular traffic flow on the airport roadway network during construction would be managed so that the quality of traffic flow would not deteriorate to unacceptable levels of service. If necessary, Massport has the ability to modify contractor schedules and access routes to minimize impacts.

The proposed construction of the Runway 33L RSA and Runway 22R is expected to generate short-term construction-related air 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 the generation of fugitive dust from disturbance of unpaved areas. The construction improvements would generate noise associated with construction activities. Construction equipment is expected to be used only during daytime hours (7 AM to 7 PM) consistently throughout the Project's construction phase to install the pile-supported deck.

Massport should make every effort to address the concerns raised in the Boston Transportation Department's (BTD) comment letter requesting a plan to keep construction traffic out of the neighborhoods surrounding Logan Airport. The FEIR should continue to strive to incorporate environmental sustainability measures, including short-term sustainability measures, such as those related to the construction phase, as well as long-term sustainability measures.

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Conclusion

I find that the DEIR has met the standards for adequacy under the MEPA regulations. The proponent should prepare the FEIR in accordance with the Scope provided above.

September 29, 2010

Date



Ian A. Bowles

Comments received:

07/27/2010	U.S. Department of Commerce National Marine Fisheries Service, 1 st Comment
08/25/2010	The Board of Underwater Archaeological Resources
09/01/2010	Office of Coastal Zone Management
09/01/2010	Department of the Army, Corps of Engineers
09/02/2010	Department of Environmental Protection
09/03/2010	Division of Marine Fisheries
09/03/2010	The Boston Harbor Association
09/03/2010	City of Boston Environmental Department
09/03/2010	Gail C. Miller
09/07/2010	U.S. Department of Commerce National Marine Fisheries Service, 2 nd Comment
09/07/2010	U.S. Environmental Protection Agency
09/09/2010	Boston Transportation Department

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Comment #	Author	Comment	Response
A.1	Ian A. Bowles. Secretary	I advise Massport that coordination with the Working Groups should continue through the Final EIR/EA and permitting processes, consistent with the Scope provided below.	Massport has continued to coordinate with the Working Groups. Since the publication of the Draft EA/EIR, Massport meet with the Working Groups on two occasions, in August and December 2010. Massport anticipates continuing to coordinate with the Working Groups during the permitting process as well as during and post-construction. Please refer to Chapter 7, <i>Public and Agency Coordination</i> , for more information.
A.2	Ian A. Bowles. Secretary	The proponent should prepare and circulate the Final EIR (FEIR) in accordance with Section 11.07 of the MEPA regulations, as modified by this Certificate.	The Final EA/EIR has been prepared and circulated in accordance with Section 11.07 of the MEPA regulations. Refer to Chapter 8, <i>Distribution List</i> , for a full list of recipients.
A.3	Ian A. Bowles. Secretary	The FEIR should contain a copy of this Certificate and of each comment letter received.	Appendix 1, <i>Secretary's Certificate on the Draft EA/EIR and Responses</i> , contains a copy of the Secretary's Certificate and Massport's responses to the Certificate. Appendix 2, <i>Response to Comments</i> , contains a copy of each comment letter received and Massport's responses to the comment letters.
A.4	Ian A. Bowles. Secretary	The proponent should circulate the FEIR in compliance with Section 11.16 of MEPA regulations, to those parties submitting written comments on the ENF, and to any state agencies from which the proponent will seek permits and approvals. The proponent should send a Notice of Availability of the FEIR to Massport's standard MEPA mailing list, as periodically updated.	The Final EA/EIR has been circulated in accordance with Section 11.16 of the MEPA regulations. Refer to Chapter 8, <i>Distribution List</i> , for a full list of recipients. In addition, the Notice of Availability has been sent to Massport's standard MEPA mailing list.
A.5	Ian A. Bowles. Secretary	A copy of the FEIR should be made available for public review at the Boston Public Library (East Boston Branch), the Revere Public Library, the Chelsea Public Library, the Everett Public Library, and the Winthrop Public Library.	The Final EA/EIR has been made available for public review at the East Boston Branch of the Boston Public Library, the Revere Public Library, the Chelsea Public Library, the Everett Public Library, and the Winthrop Public Library. Refer to Chapter 8, <i>Distribution List</i> , for a full list of recipients.
A.6	Ian A. Bowles. Secretary	As noted previously in my Certificate on the Environmental Notification Form, because there will be potential impacts to shellfish, the FEIR should be distributed to the shellfishing industry and local shellfishing representatives. I have received several comments requesting enhanced outreach to the local shellfishing industry to ensure they are afforded an opportunity to participate in the environmental impact review process for this project. I ask that Massport commit to holding a briefing with local shellfishing representatives during the preparation of the FEIR to discuss potential impacts associated with the project. I suggest that Massport contact The Boston Harbor Association and/or the Division of Marine Fisheries to help facilitate that meeting. If those discussions have already taken place, the FEIR should describe the outreach to the shellfishing community and the outcome of the discussions in greater detail.	The Draft EA/EIR was distributed to Mr. Bob Stanley of Stanley Seafood, a local processor and distributor of seafood. Mr. Stanley is the Master Digger in the Boston Harbor area, with a number of subordinates. Massport and the Massachusetts Division of Marine Fisheries held a briefing in December 2010 for local shellfishermen, where the shellfishers were able to provide input on the mitigation strategy proposed by Massport. Please refer to Chapter 7, <i>Public and Agency Coordination</i> , for more information on the meeting. As shown in Chapter 8, <i>Distribution List</i> , Massport provided a copy of the Final EA/EIR to Mr. Stanley and has informed the meeting attendees of the Final EA/EIR availability.

Comment #	Author	Comment	Response
A.7	Ian A. Bowles. Secretary	In order to ensure that the issues raised by commenters are addressed, the FEIR should include a detailed response to comments. The FEIR should include a Response to Comments section which reprints comments in their entirety. The FEIR should include responses to individual comments, in an indexed format and/or direct response to individual points within comment letters.	Appendix 1, <i>Secretary's Certificate on the Draft EA/EIR and Responses</i> , contains a copy of the Secretary's Certificate and Massport's responses to the Certificate. Appendix 2, <i>Response to Comments</i> , contains a copy of each comment letter received and Massport's responses to the comment letters. The comments and responses are produced side by side.
A.8	Ian A. Bowles. Secretary	With respect to quantification of impacts to the various wetland resource areas and types, I have received comments requesting clarification of discrepancies between the information provided in narratives and attached tables. I ask that Massport address these comments and clarify the correct numbers concerning the extent of impacts.	The Final EA/EIR clarifies the impacts to coastal wetland resources at the Runway 33L and Runway 22R ends. The revised impact areas for Runway 33L and Runway 22R are shown in Chapter 4, <i>Environmental Consequences</i> , Table 4.2-1 and Table 4.3-1, respectively. The cumulative impacts are presented in Table 4.4-1 of Chapter 4.
A.9	Ian A. Bowles. Secretary	In order to grant a Variance request, Section 310 CMR 10.05 of the regulations requires MassDEP to consider three main criteria: 1) that there are no reasonable conditions or alternatives that would allow the project to proceed in compliance with the wetland regulations; 2) that mitigation measures are proposed that will allow the project to be conditioned as to contribute to the protection of the interests identified in the Wetlands Protection Act; and 3) that the variance is necessary to accommodate an overriding community, regional, state or national public interest, or to avoid an unconstitutional taking of property without compensation. The FEIR should clearly describe how the project will comply with these requirements.	Chapter 6, <i>Regulatory Compliance</i> , documents the project's compliance with the Massachusetts Wetlands Protection Act Variance criteria.
A.10	Ian A. Bowles. Secretary	While the DEIR contained information and plans related to both runways, as described above, MassDEP has stated in its comments that the information required for consideration of a request for a Wetland Protection Act Variance has not been developed in sufficient detail for MassDEP to adequately review the variance request. Therefore as part of the FEIR, Massport should submit design-level plans depicting resource area impacts and mitigation in greater detail, as well as include detailed construction and operational specifications. I refer Massport to MassDEP's comment letter for further details on the information that will be required.	The Final EA/EIR includes conceptual design level plans that depict the resource area impacts and mitigation in greater detail. All of the requirements outlined in the Massachusetts Department of Environmental Protection's comment letter have been met.

Comment #	Author	Comment	Response
A.11	Ian A. Bowles. Secretary	The FEIR should contain further analysis for proposed mitigation sites as well as refined mitigation goals, based on public and agency feedback. MassDEP has stated in its comments that detailed mitigation design plans and specifications should be addressed in the FEIR for impacts to land under water (310 CMR 10.25), eelgrass beds (310 CMR 10.25(6)(b), and salt marsh (310 CMR 10.32) discussed in detail below.	Massport has advanced eelgrass, salt marsh, and shellfish mitigation with consensus from the resource agencies. The proposed mitigation program is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Detailed mitigation design plans and specifications are included in the chapter.
A.12	Ian A. Bowles. Secretary	The DEIR did not clarify enough what is intended to be provided as mitigation for impacts to land under water/intertidal areas. I have received several comments requesting that Massport specifically identify what mitigation measures are associated with impacts to land under water/intertidal areas and mudflat/coastal beach.	Intertidal and mud flat mitigation is proposed in conjunction with the salt marsh mitigation. The salt marsh mitigation plan proposed by Massport includes varying topography to provide a variety of wetland and habitat types. The salt marsh mitigation plan has been developed in consultation with the resource agencies, and provides the required mitigation ratio. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
A.13	Ian A. Bowles. Secretary	It is not clear whether salt marsh restoration will adequately compensate for the functions and values associated with these specific resource areas, and that topic should be addressed in the FEIR.	As further described in Chapter 5, the proposed salt marsh mitigation at EPA Sites 4 and 5 within Rumney Marsh will compensate for the functions and values associated with the resource areas.
A.14	Ian A. Bowles. Secretary	Massport should strive to minimize impacts to eelgrass in the Preferred Alternatives. The FEIR should identify, in consultation with the Eelgrass Mitigation Working Group and environmental and community representatives, the site of eelgrass re-establishment/restoration at a minimum of 3:1 ratio, or higher.	Further minimization beyond that which FAA has already approved is not practicable in light of the project purpose and is contrary to the FAA's determinations on the Runway 33L end. Massport is committed to a 3:1 eelgrass re-establishment ratio as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Massport proposes to transplant eelgrass harvested from the deck footprint and transplant it at White Head Flats and at Old Harbor. This mitigation program received consensus from the Eelgrass Working Group at the December 2010 meeting.
A.15	Ian A. Bowles. Secretary	The FEIR should include a detailed protocol in order to achieve the required level of eelgrass mitigation and how Massport intends to choose suitable transplant sites.	The Batelle Study methodologies for site selection and sites identified by the Batelle Study were included in the site selection process. The site selection process re-evaluated sites selected by the Batelle Study and a Massachusetts Division of Marine Fisheries study (Estrella 2009) by accounting for changes in light availability since the two studies were completed. During the fall of 2010, field data was collected at the sites identified by the model. As a result of the field data collection, White Head Flats and at Old Harbor were determined to be suitable for eelgrass re-establishment. The results of the site selection model and field data collection was presented in the Eelgrass Working Group at the Joint Working Group Meeting held on December 17, 2010 where it received consensus from the Working Group. The details of the eelgrass mitigation program are provided in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .

Comment #	Author	Comment	Response
A.16	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: Information on the collection of field data and the undertaking a site-selection modeling effort (as outlined in the VHB Memo Re: Logan RSA - Eelgrass Mitigation Strategy, dated August 16, 2010):	A site selection model was used to determine potential sites for eelgrass mitigation in Boston Harbor. During the fall of 2010, field data were collected at the sites identified by the model. The results of the site selection model and field data collection were presented in the Eelgrass Working Group at the Joint Working Group Meeting held on December 17, 2010. The results are also described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.17	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: An updated map of the aerial extent and density of eelgrass habitat in the project area conducted during the growing season prior to construction.	Massport completed mapping of the extent and density of the existing eelgrass bed. Massport intends to harvest eelgrass from within the proposed deck footprint prior to the start of construction for use at the mitigation sites. A post-construction monitoring program is proposed at the transplant sites and at the Runway 33L bed as documented in Chapter 5.
A.18	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: The final estimates of direct eelgrass impacts from the project and indirect impacts from shading, sediment deposition outside of the footprint, changes in sediment distribution from alterations in water circulation, and anticipated impacts from construction barges.	The direct and indirect impacts to eelgrass from the project are described in Chapter 4, <i>Environmental Consequences</i> . Section 4.2.1.1 provides the details on direct impacts to eelgrass. The indirect impacts from shading, sediment deposition, and sediment distribution are described in Sections 4.2.1.2 and 4.2.1.3. Construction barges would be located within the footprint of the deck, an area that would be lost as a result of the project, or located outside of the eelgrass bed. The post-construction mapping will confirm the limits of impact.
A.19	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: If vessels are to be anchored in eelgrass beds, a discussion of how "anchor sweep" impacts to eelgrass beds will be avoided or minimized; if impacts cannot be avoided, the effects of anchor sweep need to be calculated and mitigation provided.	Barge anchor sweep would not occur during construction. Since the construction barges would be secured with spuds, instead of anchored, there is no potential for additional impacts caused by anchor sweep. Refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.1.3, and Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
A.20	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: A schedule to minimize and/or eliminate the risk of impacts from construction vessels (e.g. limiting barge use to periods of high tide to avoid grounding of barges on eelgrass habitat and the use of buoys to mark construction corridors to contain vessel movements).	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes the efforts to minimize and/or eliminate the risk of impacts from construction vessels on eelgrass.
A.21	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: Documentation that the proposed eelgrass mitigation plans are consistent with methodologies critical to the success of eelgrass restoration efforts.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes how the proposed eelgrass mitigation plans are consistent with the methodologies critical to the success of eelgrass restoration efforts.

Comment #	Author	Comment	Response
A.22	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: A discussion and assessment of the potential eelgrass sites (including the Deer Island Flats and Governors Island Flats) identified by the Batelle study conducted as part of the HubLine project and how the findings of this study may assist Massport in choosing suitable transplant sites.	The methodologies for site selection and sites identified by the Batelle Study were included in the RSA site selection process. The site selection process re-evaluated sites selected by the Batelle Study and a Massachusetts Division of Marine Fisheries study (Estrella 2009) by accounting for changes in light availability since the two studies were completed. The details of the site selection process are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.23	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: A survey of any other sites in the outer harbor not assessed in the Batelle study with appropriate physical and biological site characteristics that optimize eelgrass survival.	The results from the Battelle 2009 study were used to re-evaluate the potential sites selected by MDMF and Battelle to account for actual light conditions in 2009. While there are numerous factors that can influence the suitability of an area to support eelgrass, light availability is the most critical factor. Focusing on areas where percent photosynthetically active radiation (PAR) at depth remains high under the reduced light conditions may allow the establishment of eelgrass populations where they can withstand the types of stresses experienced in 2009. Please refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
A.24	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: A discussion of how the eelgrass plant stock in the footprint of the construction area will be preserved for use as donor stock (i.e. harvested, transported, and transplanted - including possible transplanting into the less dense portion of the existing bed beyond the impacted area) and a timetable of the sequencing steps to ensure optimal eelgrass survival and transplanting success.	The eelgrass plant stock in the footprint of the construction area would be harvested by Massport prior to the start of construction and transplanted at a primary and backup site. The timetable and sequencing steps are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.25	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: A commitment to pre-construction and long term post-construction monitoring of any proposed mitigation site.	Massport has committed to a monitoring program as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Post-construction monitoring will occur over 5 years at the primary and backup sites. A reference site will be established for comparison purposes.
A.26	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: Documentation from the U.S. Department of Agriculture - Wildlife Services as to whether eelgrass habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and whether a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139.	USDA has observed Brant feeding in the eelgrass beds in the project area. As described in their letter addressing salt marsh mitigation siting, Brant constitute a wildlife hazard. Understanding that there are very limited sites for eelgrass mitigation, USDA has noted that mitigation of eelgrass at deeper depths are less likely to attract hazardous wildlife.

Comment #	Author	Comment	Response
A.27	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: A monitoring plan to track the success of all eelgrass transplant efforts and the criteria (e.g. root/shoot density comparable to the existing eelgrass meadow and the targeted percent of re-established cover over a one, three, and five-year timeframe) to be used to measure the success of the restoration effort.	Massport has committed to a monitoring program as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Post-construction monitoring will occur over 5 years at the primary and backup sites. A reference site will be established for comparison purposes.
A.28	Ian A. Bowles. Secretary	As requested in MassDEP's comments, the FEIR should include: Remedial plans to be undertaken in the event that initial restoration efforts fail.	In the event the restoration effort is not successful, a contingency plan will be implemented. For further information, refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.29	Ian A. Bowles. Secretary	I note that comments from CZM raise the possibility of providing out-of-kind mitigation for impacts to eelgrass because of the poor historical track record for eelgrass transplanting and restoration. I agree with CZM that contributions to alternative types of mitigation strategies should at least be included in the ongoing discussions about mitigation.	The eelgrass mitigation strategy for in-kind mitigation was proposed to and received consensus from the Eelgrass Working Group. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , presents contingencies that Massport is prepared to undertake if initial eelgrass transplanting is unsuccessful. Any additional restoration efforts would be coordinated with the resource agencies.
A.30	Ian A. Bowles. Secretary	I ask that both Massport and the Eelgrass Mitigation Working Group strive to develop a mitigation strategy with the greatest possible benefits to eelgrass habitat in both Boston Harbor and beyond.	Massport, in consultation with the Eelgrass Mitigation Working Group, has designed an eelgrass mitigation program that would have the greatest possible benefits to eelgrass habitat. The eelgrass mitigation program is further described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.31	Ian A. Bowles. Secretary	Massport should continue to further refine the Preferred Alternatives in an effort to minimize adverse impacts to the flora and fauna to the maximum degree possible.	As stated in Chapter 2, <i>Alternatives Analysis</i> , of the Final EA/EIR further minimization is not practicable in light of the project's purpose and is contrary to the FAA's determinations for Runway 33L end and Runway 22R end. As design proceeds, opportunities for additional minimization, particularly in the area of construction impacts, will be considered.
A.32	Ian A. Bowles. Secretary	Because of bird hazard risks, the DEIR states that off-site, rather than on-site, mitigation of salt marsh impacts will be pursued.	The USDA has determined that the salt marsh areas adjacent to the runways and taxiways at Logan Airport serve as an attractant for wildlife species causing hazards to aircraft operations. The USDA recommends that only off-site salt marsh mitigation opportunities be carried forward for further consideration. The USDA's letter, dated December 16, 2010, is included in Appendix 3, <i>Agency Correspondence</i> . Salt marsh mitigation is proposed at EPA Sites 4 and 5 in Rumney Marsh.
A.33	Ian A. Bowles. Secretary	In the DEIR, twelve sites are recommended for further review as potential mitigation sites. Seven of those sites are within Rumney Marsh Reservation. I remind Massport that for all mitigation, the expectation remains that the FEIR will include a short list of viable mitigation sites.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , identifies all of the potential salt marsh mitigation sites that have been assessed by Massport since the start of this project. As described in Section 5.2, at the December 17, 2010 Salt Marsh Working Group meeting, consensus was reached among the resource agencies and Massport that EPA Sites 4 and 5, in Rumney Marsh, would be the preferred salt marsh mitigation site.

Comment #	Author	Comment	Response
A.34	Ian A. Bowles. Secretary	To compensate for adverse impacts to salt marsh resources which cannot be avoided, the FEIR should contain no less than a 2:1 ratio or higher ratio for emergent wetlands, with first priority for the restoration or re-establishment of existing wetlands, and a higher mitigation ratio, which should be determined by the Salt Marsh Mitigation Working Group, if enhancement of other salt marsh is required.	Salt marsh mitigation has been proposed at a 2:1 replacement to loss ratio. Massport intends to restore salt marsh in Rumney Marsh at EPA Sites 4 and 5. The type and location of salt marsh received consensus from the Salt Marsh Working Group at the December 2010 meeting.
A.35	Ian A. Bowles. Secretary	In order to achieve at least the 2:1 salt marsh replacement ratio, the FEIR should document the protocol for how Massport intends to choose and develop suitable replication sites.	Please see the response to Comment A.33 above.
A.36	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Plan views, cross-sections, final planting plans, and a monitoring plan.	Salt marsh mitigation plans include plan views, cross sections, final planting plans, and a monitoring plan. These are included in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.37	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: The size and location of the existing and replicated wetlands, at a scale in the range of 1"=10' to 1"=40', and shall include easily identifiable landmarks such as surveyed flag locations, benchmarks, or structures.	Salt marsh mitigation plans include the size and location of the existing and replicated wetland, at a readable scale, and identifies landmarks.
A.38	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Contour lines at 2' intervals for existing areas and 1' intervals for proposed areas.	Salt marsh mitigation plans include contour lines at 2-foot intervals for the existing areas and 1-foot intervals for the proposed areas.
A.39	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Sufficient number of spot elevations to describe the topography of the wetland and the surrounding area including grade elevations below the highest spring tides of the year with portions below mean high tide.	Salt marsh mitigation plans include spot elevations of the wetland and the surrounding area, including grade elevations below the highest spring tides of the year with portions below the mean high tide.
A.40	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: The locations of soil test pits and vegetation plots.	Soil test pits and vegetation plots were not developed in the I-95 fill area, as these characteristics have been previously documented and are not required for the salt marsh restoration design.
A.41	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Cross-sections of the existing and proposed wetland subsurface, showing soil types, depths, and locations using both horizontal and vertical scales.	The salt marsh replacement plans include cross sections of the existing and proposed wetland subsurfaces, and show soil types, depths, and locations using both horizontal and vertical scales.

Comment #	Author	Comment	Response
A.42	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Documentation that a minimum replacement area ratio of 2:1 be located in the same general area or water body as the area lost, unless a determination is provided from the U.S. Department of Agriculture - Wildlife Services that salt marsh habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139.	The USDA has determined that the salt marsh areas adjacent to the runways and taxiways at Logan Airport serve as an attractant for wildlife species causing hazards to aircraft operations. The USDA recommends that only off-site salt marsh mitigation opportunities be carried forward for further consideration. The USDA's letter, dated December 16, 2010, is included in Appendix 3, <i>Agency Correspondence</i> .
A.43	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Locations that are not tidally restricted by any pipe, culvert, bridge, roadway, or other development and not colonized by invasive species.	The proposed salt marsh does not include areas that are tidally restricted by any pipe, culvert, bridge, roadway or other development. There are some areas at the salt marsh mitigation site in Rumney Marsh that have invasive species. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , provide the protocol Massport intends to use to control the spread and colonization of invasive species into the proposed salt marsh mitigation areas.
A.44	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Internal sloped drainage creeks with suitable depths to provide killifish habitat.	The salt marsh replacement plans include creeks and panes that could provide killifish habitat.
A.45	Ian A. Bowles. Secretary	As requested by the MassDEP, the salt marsh replacement plans should include: Provisions for assessments of potential contamination if the proposed salt marsh restoration sites containing dredged spoils.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes the provisions for assessments of potential contamination. However, the soil at the proposed salt marsh mitigation site in Rumney Marsh has been tested for numerous previous projects and has been found to be clean.
A.46	Ian A. Bowles. Secretary	MassDEP has indicated in its comments that depending on project specifics, proposed salt marsh restoration mitigation that involves the enlargement, removal, or replacement (with tide gates) of culvert tidal restrictions may be acceptable for meeting some portion of the salt marsh mitigation requirement.	Salt marsh mitigation will be entirely replacement salt marsh at Rumney Marsh. The enlargement, removal, or placement of culvert tidal restrictions are not proposed.
A.47	Ian A. Bowles. Secretary	I note that several comments support the idea of expanding the list of potential mitigation sites presented in the DEIR to include the possibility of in-lieu contributions to supplement funding of the on-going Broad Meadows project in Quincy. It is not clear whether the Broad Meadows project would provide mitigation for impacts to salt marsh, for impacts to land under water, or both. The FEIR should include an update on these discussions and clarify the specific impacts that would be mitigated.	Massport evaluated Broad Meadow as a potential salt marsh mitigation site. The costs for completing the Broad Meadows project including disposal exceed the costs for mitigation at the other sites evaluated by Massport. Massport also determined that only providing high marsh, which would reduce the costs, would not accomplish the goals identified for salt marsh and intertidal mitigation. Therefore, Massport, in conjunction with the Salt Marsh Working Group, determined that Broad Meadow would not be retained for further investigation and design.

Comment #	Author	Comment	Response
A.48	Ian A. Bowles. Secretary	I recognize that the viability of the in-lieu fees for mitigation is dependent on the final determination of the U.S. Army Corps of Engineers concerning the acceptable parameters for in-lieu fee contributions.	In-lieu fees for mitigation are currently proposed as mitigation for the loss of a commercial shellfishing resource. Please refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.49	Ian A. Bowles. Secretary	MassDEP has stated that if Broad Meadows is deemed to constitute satisfactory mitigation, further consideration would be required for compensation of intertidal and shellfish impacts.	As described in the response to Comment A.47 above, Massport evaluated Broad Meadow as a potential site for salt marsh mitigation, but determined in coordination with the Working Group that it could not provide adequate mitigation at a reasonable cost.
A.50	Ian A. Bowles. Secretary	Shellfish mitigation plans, as discussed below, should be further refined in the FEIR to specify terms and procedures for the harvest and transplant of shellfish.	Shellfish mitigation plans, including the terms and procedures for the harvest and transplant of shellfish, are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.51	Ian A. Bowles. Secretary	The areas in which work is proposed are not currently accessible to the public and would not be accessible to the public for the foreseeable future. These areas are within the state-legislated Logan Airport security zone restrictions on public access. This security zone extends 500 feet seaward of the high water mark. The substantive standards that MassDEP will use to evaluate the project are those related to nonwater-dependent infrastructure facilities found at 310 CMR 9.55. Since public access is restricted at this site due to security concerns, MassDEP review would concentrate instead on the resource impacts to salt marsh, eelgrass, and loss of shellfish habitat and adequate mitigation of those impacts in accordance with 310 CMR 9.55(1)(b-c). The FEIR should further refine the proposed mitigation plan in anticipation of the filing of the variance license application.	Chapter 6, <i>Regulatory Compliance</i> , provides a statement of compliance with the applicable provisions of the Waterways Regulations for a nonwater-dependent facility (310 CMR 9.32) and for a variance (310 CMR 9.21). The proposed mitigation program is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Massport provided the same information to Massachusetts Department of Environmental Protection in the Chapter 91 License application.
A.52	Ian A. Bowles. Secretary	I acknowledge that the proposed project presents a somewhat unique circumstance where public access to tidelands is not possible. The FEIR should however address whether the project may be able to provide additional opportunities for access to tidelands for shellfishing in other locations, for example.	No alternative locations have been identified where Massport is able to provide public access to tidelands for shellfishing. Massport has, as part of previous projects, made a considerable investment in public access to the waterfront at Piers Park, the Navy Fuel Pier and other locations. The planned in-lieu funding agreement with MA DMF is intended to address these issues.
A.53		The FEIR should also provide further information on the overall public benefits provided by the project since promoting access to tidelands is not appropriate.	The overall public benefit provided by the RSA Improvements Project is improved public safety, as documented in Chapter 1, <i>Purpose and Need</i> , of the Final EA/EIR.
A.54	Ian A. Bowles. Secretary	The DEIR also explained some of the habitat enhancements as a result of the project. However, the FEIR needs to contain a greater level of information on this topic than what was provided in the DEIR and should address the detailed issues raised from federal, state, and city agencies concerning impacts to shellfish and to shellfishing.	Habitat enhancements provided by the proposed RSA Improvements project consist of restoring eelgrass beds in Boston Harbor and restoring salt marsh and intertidal flats in Rumney Marsh, as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Issues related to shellfish and shellfishing are discussed in Chapter 4, <i>Environmental Consequences</i> , and Chapter 5.

Comment #	Author	Comment	Response
A.55	Ian A. Bowles. Secretary	DMF has stated that the impact of shade on the underlying shellfish may be significant due to potential changes in fish foraging behavior, shellfish food availability and potential increase in fouling invasive tunicates under the structure. DMF has recommended that the FEIR include a survey of other large piers in the area to better understand the conditions of underlying shellfish and benthic habitats and information of what monitoring will occur of invasive species and colonization by mussels after the construction.	As described in Chapter 4, <i>Environmental Consequences</i> , Section 4.2.1.2, the proposed deck would not cause indirect impacts to Land Containing Shellfish. To evaluate if shading affects blue mussel beds, surveys were completed of several shaded sites as described in Section 4.2.1.2. Please also refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information on the proposed monitoring program.
A.56	Ian A. Bowles. Secretary	I ask that Massport work with the mitigation working groups to discuss a methodology for further assessment of impacts to shellfish.	Massport further assessed impacts to shellfish by holding a briefing for local shellfishers. Those in attendance at the meeting provided new and additional information about the shellfish beds around Logan Airport and how the project would impact those shellfish beds and shellfishing in general. This information has been incorporated in Chapter 4, <i>Environmental Consequences</i> . Massport has proposed a mitigation program based on the information gathered at the meeting and developed in conjunction with the regulatory agencies, and described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.57	Ian A. Bowles. Secretary	Several commentators have stated that in recent years, a number of shellfish beds near Logan Airport and the Town of Winthrop have reopened to shellfishing, thanks to a cleaner Harbor. DMF has indicated in its comments that the mudflats on the project site support commercially harvested shellfish beds including soft-shell clams (<i>Mya arenaria</i>) and blue mussels (<i>Mytilus edulis</i>). According to DMF, the area's average production, calculated with several years of data, is over 5,130 bushels of soft-shell clams per year. In addition, DMF states that the site is favored by shellfishermen because of its wide intertidal flat, enabling access to harvestable area on smaller tides. The FEIR should include a detailed account of the expected impacts to shellfishing from the project, and should propose mitigation for those impacts as appropriate.	The Draft EA/EIR was distributed to Mr. Bob Stanley of Stanley Seafood, a local processor and distributor of seafood. Mr. Stanley is the Master Digger in the Boston Harbor area, with a number of subordinates. Massport and the Massachusetts Division of Marine Fisheries held a briefing in December 2010 for local shellfishermen, where the shellfishers were able to provide input on the mitigation strategy proposed by Massport. Please refer to Chapter 7, <i>Public and Agency Coordination</i> , for more information on the meeting. As shown in Chapter 8, <i>Distribution List</i> , Massport provided a copy of the Final EA/EIR to Mr. Stanley and has informed the meeting attendees of the Final EA/EIR availability.
A.58	Ian A. Bowles. Secretary	As noted above, the FEIR should address outreach efforts to those potentially affected in the shellfishing community.	The Draft EA/EIR was distributed to Mr. Bob Stanley of Stanley Seafood, a local processor and distributor of seafood. Mr. Stanley is the Master Digger in the Boston Harbor area, with a number of subordinates. Massport and the Massachusetts Division of Marine Fisheries held a briefing in December 2010 for local shellfishermen, where the shellfishers were able to provide input on the mitigation strategy proposed by Massport. Please refer to Chapter 7, <i>Public and Agency Coordination</i> , for more information on the meeting. As shown in Chapter 8, <i>Distribution List</i> , Massport provided a copy of the Final EA/EIR to Mr. Stanley and has informed the meeting attendees of the Final EA/EIR availability.

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A.59	Ian A. Bowles. Secretary	<p>Although sea turtles have never been reported in Boston Harbor, NMFS considers that sea turtles may be found seasonally in Boston Harbor. The propose Runway 33L pile-supported deck could impact habitat potentially used by sea turtles, but there likely would be no direct impacts to species. The five construction options would have a similar effect on eelgrass and therefore on sea turtle habitats. The proposed Runway 22R ISA would result in the loss of approximately 1.4 acres of intertidal habitat and 700 square feet of subtidal habitat that could potentially be used by seas turtles. The FEIR should discuss the loss of this habitat and substrate in the project area.</p>	<p>Prior to the filing of the Draft EA/EIR, the FAA made a preliminary determination that the proposed pile-supported deck is not likely to adversely affect any threatened or endangered species listed under the jurisdiction of the National Marine Fisheries Service (NMFS). NMFS concurred with the FAA's determination, and indicated that the ESA Section 7 Consultation is complete. Although the Secretary's Certificate on the Draft EA/EIR requires further discussion of the impacts to sea turtle habitat, NMFS has determined that additional analysis is not required. Please refer to Chapter 4, <i>Environmental Consequences</i>, Sections 4.2.4 and 4.3.4 for Runway 33L and Runway 22R, respectively.</p>
A.60	Ian A. Bowles. Secretary	<p>The Water Quality Certification application requires documentation of how the project meets regulation requirements of 314 CMR 9.00 and the associated criteria for the evaluation of applications for discharge of dredged or fill material to salt marsh and land under water at 310 CMR 9.06. State water quality standards contained in 314 CMR 9.00 and 314 CMR 4.00 would apply to the dredging that would be necessary to remove unsuitable substrate at the Runway 22R end, as well as to the potential temporary construction-period increased in sedimentation and turbidity from the construction activities at the ends of both Runway 22R and 33L.</p>	<p>A statement of compliance with the regulatory requirements of 314 CMR 9.00 is provided in the Final EA/EIR. Please refer to Chapter 6, <i>Regulatory Compliance</i>, for more information.</p>
A.61	Ian A. Bowles. Secretary	<p>Sediment sampling/testing information and a discussion of dredge material disposal options was not provided in the DEIR and must be developed as part of the FEIR. Specifically, Section 4.3.7.3 (pg.4-93) indicated that the sediment related to Runway 22R ISA "were sampled and subjected to both physical and chemical analysis in accordance with Massachusetts Water Quality Certification Regulation [314 CMR 9.00] and compared to NOAA's Sediment Quality Guidelines." However, results of the sampling were not included in the DEIR.</p>	<p>The results of the sediment sampling is included in the Final EA/EIR. Please refer to Chapter 4, <i>Environmental Consequences</i>, Sections 4.2.5.3 and 4.3.5.3 for Runway 33L and Runway 22R, respectively.</p>
A.62	Ian A. Bowles. Secretary	<p>In addition, the DEIR states in the Temporary Construction Impacts stated that "any turbidity created would be quickly dispersed by the tides; therefore, the effects from the temporary construction-related turbidity are negligible." According to their comments, MassDEP does not consider "tide dispersion" as a Best Management Practice (BMPs) and will require a turbidity monitoring program during excavation/dredging of approximately 8,450 cubic yards of unsuitable material.</p>	<p>Construction-period mitigation measures, as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i>, discusses the construction-period measures that would be implemented to monitor and control turbidity during construction of the Runway 22R ISA.</p>

Comment #	Author	Comment	Response
A.63	Ian A. Bowles. Secretary	The FEIR should include results of the sediment analysis, reconsideration of turbidity control BMPs, and consideration of on-site dredged material dewatering.	The results of the sediment sampling is included in the Final EA/EIR. Please refer to Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5.3 and 4.3.5.3 for Runway 33L and Runway 22R, respectively. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , addresses construction-period turbidity controls.
A.64	Ian A. Bowles. Secretary	The Wetlands and 401 Water Quality Certification regulations, at 310 CMR 10.05(6) and 314 CMR 9.06(6), respectively, require compliance with ten Stormwater Standards to protect wetland interests. Unmanaged or improperly managed stormwater runoff causes detrimental effects to the interests protected in wetland resource areas including erosion, scour, sedimentation, changes to hydrology, changes to wetland plant communities, promotion of invasive plant species (e.g. Phragmites, an invasive plant species is now present at Logan Airport), and damaging effects to aquatic organisms including fin fish and shellfish.	Chapter 6, <i>Regulatory Compliance</i> , documents how the proposed project meets the ten stormwater standards for Runway 33L and Runway 22R. As described in Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5 and 4.3.5 for Runway 33L and Runway 22R, respectively, the proposed improvements would not cause erosion, change hydrology, change the wetland plant community, cause invasive species to expand at the Airport, or affect aquatic organisms.
A.65	Ian A. Bowles. Secretary	The velocity of the discharged stormwater is also of concern, since unchecked velocity may scour coastal beaches and lead to loss of aquatic plants, including the habitat aquatic plants provide to fin fish and shellfish.	Stormwater runoff from the deck will not erode sediments adjacent to the deck because discharge will be distributed and will only occur at locations that are inundated throughout the tidal cycle (will not fall onto exposed coastal beach or mud flats during any tide cycle). Please refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.5 for further information.
A.66	Ian A. Bowles. Secretary	For the 33L RSA, Massport proposes to collect and discharge stormwater runoff directly to wetland resource areas within any recharge or water quality treatment, which may impair interests protected by the Wetlands Protection Act, including fin fish and shellfish. Measures must be proposed in the FEIR to comply with the ten Stormwater Standards.	Please see the response to Comment A.64 above.
A.67	Ian A. Bowles. Secretary	MassDEP has provided detailed comments on this subject that should be addressed in the FEIR including evaluation of Environmentally Sensitive Site Design (ESSD), such as including Low Impact Development (LID) measures.	Evaluations of Environmentally Sensitive Site Design and Low Impact Development measures are provided in the Final EA/EIR in Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5 and 4.3.5 for Runway 33L and Runway 22R, respectively.

Comment #	Author	Comment	Response
A.68	Ian A. Bowles. Secretary	In addition, MassDEP has advised directing the runoff from the proposed deck to be recharged to groundwater because this will reduce velocity, volume, and scour effects, as well as freshwater impacts to the intertidal and tidal zones.	Infiltration to groundwater is not a significant interest at Logan Airport, as groundwater elevations across the airfield are tidally controlled, the airport is constructed on reclaimed land, and the resulting soils are unsuitable for recharge. Logan does not contribute to groundwater supplies, nor is it significant to maintaining base flows to streams or waterbodies. Therefore, the proposed stormwater management system does not include infiltration BMPs because infiltration is not occurring under existing conditions and is not feasible at this location because of inadequate separation from seasonal high groundwater and poor-quality fill materials. Please refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.5.1 of the Final EA/EIR.
A.69	Ian A. Bowles. Secretary	Runway End 22R must also comply with the ten Stormwater Standards specified at 310 CMR 10.05(6)(k)(1)-(10) and 314 CMR 9.06(6).	The Runway 22R ISA does not create any new impervious areas and fully complies with all ten Massachusetts Stormwater Standards as documented in Chapter 6, <i>Regulatory Compliance</i> .
A.70	Ian A. Bowles. Secretary	The DEIR only included a proposal to improve conditions at Outfall A-12 to reduce scour. Alternative measures must be included in the FEIR to meet the required Stormwater Standards.	The Runway 22R ISA does not create any new impervious areas and fully complies with all ten Stormwater Standards.
A.71	Ian A. Bowles. Secretary	The FEIR must address the comments related to stormwater issues raised during the review of the DEIR.	Massport has addressed all of the comments on the Draft EA/EIR related to stormwater. Please refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.25 and Section 4.3.5 for information regarding the impacts to water quality and stormwater management at Runway 33L and Runway 22R, respectively. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for information on the proposed water quality mitigation. Refer to Chapter 6, <i>Regulatory Compliance</i> , for a statement of compliance with the Massachusetts Stormwater Management Standards.
A.72	Ian A. Bowles. Secretary	The FEIR should discuss how construction would be under taken in a way that minimizes impacts to resources.	Rigorous construction-period containment measures and monitoring has been proposed to protect adjacent coastal resource areas. Construction phase and post-construction monitoring of coastal resource areas would occur. These measures are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
A.73	Ian A. Bowles. Secretary	Massport should make every effort to address the concerns raised in the Boston Transportation Department's (BTD) comment letter requesting a plan to keep construction traffic out of the neighborhoods surrounding Logan Airport.	As described in Section 4.2.5 of the Draft EA/EIR, no construction traffic would be permitted in the residential neighborhoods surrounding Logan Airport. Massport's agreement with the Contractor would specify that direct construction truck traffic access to the Runway 33L RSA improvements construction site be primarily through the airport's North Gate for the duration of construction. In addition, the agreement would limit Airport access by the Contractor to federal or State highways, restricting any use of East Boston roadways by construction vehicles.

Comment #	Author	Comment	Response
A.74	Ian A. Bowles, Secretary	The FEIR should continue to strive to incorporate environmental sustainability measures, including short-term sustainability measures, such as those related to the construction phase, as well as long-term sustainability measures.	Massport has evaluated options for including sustainability measures into the construction of the Runway 33L RSA and Runway 22R ISA. Construction period measures are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . The two runway safety areas will be stable structures, constructed of natural materials, steel or concrete, and will not require long-term use of energy.



Secretary's Certificate on the Environmental Notification Form



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August 14, 2009

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
 ON THE
 ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME : Boston-Logan International Airport Runway Safety Area
 Improvements Project
 PROJECT MUNICIPALITY : East Boston
 PROJECT WATERSHED : Boston Harbor
 EOEА NUMBER : 14442
 PROJECT PROPONENT : The Massachusetts Port Authority
 DATE NOTICED IN MONITOR : July 8, 2009

Pursuant to the Massachusetts Environmental Policy Act (G. L., c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this **project requires** the preparation of an Environmental Impact Report (EIR).

Project Overview

According to the Environmental Notification Form (ENF), the proposed project consists of enhancing the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport. The proposed improvements are required to enhance the RSAs to be consistent with the current Federal Aviation Administration's (FAA) airport design criteria for RSAs and to enhance rescue access in the event of an emergency. RSAs are safety measures designed exclusively to function in the event of an undershoot, overshoot or excursion from the runway. RSAs do not extend runways or have any effect on normal runway operations, runway capacity or types of aircraft which can use the runways. Typical RSAs are 1,000 feet long by 500 feet wide.

The existing RSA at the end of Runway 33L does not meet standard FAA design criteria

for overrun and undershoot protection for the design aircraft for that runway, the Boeing 747-400. The existing RSA is 187.5 feet long and 500 feet wide and is therefore too short to provide protection consistent with FAA criteria. Within this area is a 158-foot long and 170-foot wide Engineered Material Arresting System (EMAS) bed constructed of collapsible concrete blocks with predictable deceleration forces, installed in 2006 as an interim safety measure. When an aircraft rolls into an EMAS bed, the tires of the aircraft collapse the lightweight concrete and the aircraft is slowed down in a way that minimizes damage to the aircraft. The proposed project is intended to enhance the Runway 33L RSA so that it provides overrun and undershoot protection consistent with the design criteria in the FAA's Airport Design Advisory Circular to the extent feasible.

The existing RSA at the end of Runway 22R meets the minimum FAA design criteria for overrun protection for the runway's design aircraft but does not comply with undershoot requirements. However, given that Runway 22R is very rarely used for arrivals and has an 815-foot displaced threshold, it is unlikely that aircraft would ever undershoot this end of the runway. Therefore, the Runway 22R RSA enhancement is intended to protect aircraft in the event that an aircraft arriving on Runway 4L overruns and fails to stop on the runway. The RSA is 215 feet long and 500 feet wide, and includes a 190-foot long and 170-foot wide EMAS bed. As a condition of approving the installation of the existing EMAS bed, the FAA required Massport to consider options for further enhancing the level of safety provided by the existing RSA. The current project proposal is consistent with that commitment.

State Permits and Jurisdiction

This project is subject to a mandatory EIR pursuant to Section 11.03(3)(a)(2) of the MEPA regulations because it involves Agency Action and will result in wetland alterations that require a Variance in accordance with the Wetlands Protection Act.

The project will require a 401 Water Quality Certificate and a Chapter 91 License from the Department of Environmental Protection (MassDEP). The proposed project may also require approval from the Massachusetts Natural Heritage and Endangered Species Program. The proposed project will require filing a Notice of Intent with the Boston Conservation Commission to obtain an Order of Conditions pursuant to the Wetlands Protection Act (WPA). However, I note that the WPA regulations (310 CMR 10.32(2)) prohibit any alteration of Salt Marsh or marine fisheries habitat. Therefore, a Variance from MassDEP is required for the proposed RSA enhancements for both Runway 33L and 22R. In addition, both the proposed RSA enhancements for Runway 33L and Runway 22R will require fill materials to be placed below the extreme high water line. Therefore, an Individual Section 10/ 404 permit from the U.S. Army Corps of Engineers (USACE) is required. The authority for these permits is Section 10 of the Rivers and Harbors Act for any structures or work within tidal waters up to mean high water and Section 404 of the Clean Water Act for placing fill or dredged material up to the extreme high water line or within adjacent wetlands. The proposed project may also be subject to Coastal Zone Management (CZM) federal consistency review, in which case the project must be found to be

consistent with CZM's enforceable program policies. The project must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site.

The project will be undertaken by Massport, a State Agency, and financed in part by funds from the Commonwealth. Therefore, MEPA jurisdiction for this project is broad and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Joint Review

The project will require the submission of an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). Both MEPA and NEPA regulations allow for coordinated submission of required documentation. It is my view that the planning for this project would be best served by a coordinated review and the submission of a single set of documents to satisfy the requirements of both MEPA (Section 11.09(4)(c) and NEPA. Therefore, I will allow (and encourage) the proponent to submit one set of documents that satisfies both the state and federal environmental processes. The proponent should coordinate this joint review process with both agencies to establish the necessary review periods.

Review of the ENF and Draft EIR Scope

Format and Circulation

The proponent should prepare and circulate the Draft EIR (DEIR) in accordance with Sections 11.07 of the MEPA regulations, as modified by this Certificate. The DEIR should contain a copy of this Certificate and of each comment letter received. The proponent should circulate the DEIR in compliance with Section 11.16 of MEPA regulations, to those parties submitting written comments on the ENF, and to any state agencies from which the proponent will seek permits or approvals. The proponent should send a Notice of Availability of the DEIR to Massport's standard MEPA mailing list, as periodically updated. The proponent should also make a reasonable number of copies of the DEIR available on a first come, first served basis. Because there will be impacts to land containing shellfish, the DEIR should be distributed to the shellfishing industry and local shellfishing representatives. A copy of the DEIR should be made available for public review at the Boston Public Library (East Boston Branch), the Revere Public Library, the Chelsea Public Library, the Everett Public Library and the Winthrop Public Library.

Project Description

The DEIR should provide a detailed project description with a summary/history of the project. It should include existing and proposed site plans. The DEIR should identify and

describe any project phasing and the timing of the phases. It should describe each State Agency Action required for the project. The DEIR should demonstrate how the project is consistent with the applicable performance standards. It should contain sufficient information to allow the permitting agencies to understand the environmental consequences of their official actions related to the project.

Alternatives Analysis

The ENF indicates that the proponent considered a number of potential alternatives resulting in the selection of two Preferred Alternatives. The Preferred Alternative for Runway 22R involves the installation of an inclined safety area at the end of the runway. This alternative would require gravel fill to be placed approximately 190 feet north from the existing EMAS bed and would be graded over the full width of the extended safety area down to the mean low water elevation. The Preferred Alternative for Runway 33L involves the installation of a new EMAS bed and a pile-supported pier extending into Boston Harbor.

Runway 33L

According to the ENF, the following alternatives were considered for Runway 33L:

- FAA required full 1,000-Foot length RSA;
- Several different shorten and/or shift runway and enhance RSA with EMAS (including the *Preferred Alternative* 600-foot long by 300-foot wide RSA with EMAS on a pile-supported deck);
- RSA with EMAS, including width and platform options; and
- No-Action.

An inclined safety area alternative was not considered for Runway 33L because it cannot provide protection for aircraft in the event of an undershoot. Furthermore, the inclined safety area previously permitted (EEA #5122) was not constructed due to concerns by pilots related to the transition between the proposed inclined safety area and the existing light pier. The FAA design criteria require that the alternatives for Runway 33L provide protection for both aircraft overruns and undershoots. Because Massport has indicated that several of the examined alternatives are infeasible due to cost or unacceptable environmental impacts, the alternatives that should be carried forward to the DEIR are the 600-foot long by 300-foot wide RSA with EMAS on a pile-supported deck and the no action alternative for Runway 33L.

Runway 22R

The following alternatives were considered for Runway 22R:

- Enhanced EMAS;
- Inclined Safety Area; and
- No Action.

The analysis provide in the ENF indicates that several of the examined alternatives are infeasible due to cost or unacceptable environmental impacts. Therefore, the alternatives that

should be carried forward from the ENF to the DEIR are the inclined safety area and no action alternative for Runway 22R. The ENF did not however examine the potential use of a pile-supported structure at Runway 22R in lieu of the inclined safety area. The selection of a pile-supported structure rather than fill for the Runway 33L safety improvements could be a significant impact-minimization measure. The DEIR should therefore examine whether there are feasible alternatives to the placement of fill for the Runway 22R project, and if not, whether the amount of fill can be further reduced. If a feasible alternative that involves no fill or reduced fill emerges, it should be included as one of the alternatives for Runway 22R along with the inclined safety area and no action alternatives.

For both runway projects, the DEIR should examine alternative configurations and alignments, if any, that meet safety objectives while minimizing impacts. In addition, the proponent should continue working with the relevant state and federal agencies and present in the DEIR any design refinements of the Preferred Alternatives for each runway. The DEIR should also summarize any alternatives that have previously been explored for the project site by the proponent. To the extent that alternatives have been eliminated in reliance on discussions with the FAA, such communications should be documented and included in the DEIR. The analysis should clearly present and identify the advantages and disadvantages of the Preferred Alternative.

Project Impacts with Preferred Alternative:

The proposed RSA enhancements will result in the loss of coastal wetland resources. However, with selection of the pile-supported deck as the preferred construction technique for Runway 33L, direct impacts to these resources have been avoided or minimized the maximum extent practicable while still meeting the project purpose and need. According to the ENF, Runway 33L Preferred Alternative will result in impacts to the following coastal wetland resources and intertidal and benthic community habitat:

- Coastal Bank – Portions of the Coastal Bank would be replaced by the pile-supported deck structure. Approximately 315 linear feet would be impacted.
- Coastal Beach – Approximately 27,550 square feet of Coastal Beach would be located beneath the pile supported deck. However, Coastal Beach would be lost only where pilings are installed beneath the deck.
- Land Under the Ocean – Approximately 95,530 square feet of land Under the Ocean would be located beneath the pile-supported deck. However, Land Under the Ocean would only be lost where pilings are installed beneath the deck.
- Land Containing Shellfish – Approximately 123,080 square feet of Land Containing Shellfish would be located beneath the pile-supported deck. However, Land Containing Shellfish would only be lost where pilings are installed. The pilings beneath the high water mark would provide substrate for attached and mobile intertidal and subtidal invertebrates including blue mussels.
- Submerged Aquatic Vegetation (eelgrass) - Approximately 55,420 square feet of eelgrass would be located beneath the pile-supported deck. The eelgrass bed would be lost beneath the deck where pilings are installed.

According to the ENF, Runway 22R Preferred Alternative will result in impacts to the following coastal wetland:

- Coastal Bank – Approximately 530 linear feet (replaced by a filled structure).
- Salt Marsh – Approximately 27,930 square feet.
- Coastal Beach – Approximately 35,360 square feet.
- Land Under the Ocean – Approximately 4,700 square feet.
- Land Containing Shellfish – Approximately 67,990 square feet.

Given the potentially significant environmental impacts of the project on coastal wetland resources, the DEIR should continue to provide updated information documenting the purpose and need for the proposed project.

Wetland

As designed, this project will require MassDEP to issue a Variance from the WPA Regulations. In order to grant a Variance request, section 310 CMR 10.05 of the regulations requires MassDEP to consider three main criteria: 1) that there are no reasonable conditions or alternatives that would allow the project to proceed in compliance with the wetlands regulations; 2) that mitigation measures are proposed that will allow the project to be conditioned so as to contribute to the protection of the interests identified in the Wetlands Protection Act; and 3) that the variance is necessary to accommodate an overriding community, regional, state or national public interest, or to avoid an unconstitutional taking of property without compensation. The DEIR should address these three criteria.

The Commonwealth has endorsed a “No Net Loss Policy” that requires that all feasible means to avoid and reduce the extent of wetland alteration be considered and implemented. The Wetland Section of the DEIR should conform to this approach by first examining options that avoid impacts to wetland resource areas, their associated buffer zones. Where it has been demonstrated that impacts are unavoidable, the DEIR should illustrate that the impacts have been fully mitigated.

For any amount of required wetlands replication, a detailed wetlands replication plan should be provided in the DEIR that, at a minimum, includes: replication location(s) delineated on plans, elevations, typical cross sections, test pits or soil boring logs, the hydrology of areas to be altered and replicated, list of wetlands plant species of areas to be altered and the proposed wetland replication species, planned construction sequence, and a discussion of the required performance standards and monitoring. The plans should include monitoring for and the management of any invasive species that may begin to grow in the replication area.

Due to the significant impacts that the project will have upon coastal wetland resource areas within Boston Harbor, the DEIR should contain a cumulative assessment of the effects of the project on the functions and values of these resources. The DEIR should include current and anticipated construction projects by Massport and others in the surrounding area that may further

degrade the coastal resources. In addition, an assessment should further quantify and differentiate between the anticipated impacts associated with construction phases and full build-out.

The ENF indicates Massport's recognition that appropriate compensatory mitigation for impacts to these resource areas will be required. Massport should continue to work closely with local, state and federal environmental agencies to develop mitigation and monitoring plans.

The DEIR should contain a detailed analysis of the on-site mitigation options as requested in the City of Boston's comment letter. The DEIR must also address the possibility of off-site mitigation if on-site mitigation is infeasible. As mitigation strategies are developed, every effort should be made to ensure that restoration and mitigation are conducted in Boston Harbor. As the City of Boston indicated in its comment letter, existing, degraded areas of salt marsh, eelgrass and shellfish beds should be assessed for purposes of rehabilitation and recently restored areas, such as the salt marsh in Chelsea Creek off of Condor Street in East Boston, should be reviewed for possible expansion in the DEIR. The scope and extent of mitigation and restoration efforts should be designed to result in a net benefit to affected coastal resource areas in the Harbor. Proposals to conduct restoration and mitigation outside of the affected resource should be discussed in the context of clear facts demonstrating that they cannot be accomplished in the Harbor or other nearby areas in Boston.

In addition, rigorous construction-period containment measures and monitoring will be crucial to minimizing project related alterations to coastal resource areas. The DEIR should contain information on the construction phase and post construction monitoring plans. Reporting must be established to assess the health of existing and restored resource areas. The DEIR should contain contingencies to ensure that if restoration efforts fail, additional measures will be required to compensate for the loss of the resource area functions and values.

Waterways and Tidelands Impacts

Portions of the proposed RSA enhancements seaward of the mean high water line would require a Chapter 91 license. For those portions of the project within Chapter 91 jurisdiction, the waterways regulations at 310 CMR 9.05 require MassDEP to issue a license for any construction within tidelands, after considering a project's impacts on the preservation of rights held by the Commonwealth in trust for the public. The regulations at 310 CMR 9.31 establish two general standards for any Chapter 91 license:

- The project must meet the basic requirements listed in 310 CMR 9.31(1); and
- The project must serve a proper public purpose.

The DEIR should address how the project will meet these standards, particularly in light of MassDEP comments concerning the need for a Variance outlined below.

The Preferred Alternatives for safety improvements to Runways 22R and 33L include proposed changes on both filled and flowed tidelands. Pursuant to 310 CMR 9.03(3)(b), no MassDEP authorization is required for Massport activities on filled tidelands at Logan Airport. MassDEP has preliminarily determined that the proposed project is a nonwater-dependent use project in accordance with 310 CMR 9.12(2), since airports do not require direct access to tidelands. This finding is particularly significant in this instance since new fill and structures for nonwater-dependent use are generally prohibited seaward of the mean high water mark [310 CMR 9.32(1) (a)]. While there are limited exceptions to this prohibition which allow placement of fill in some cases, according to MassDEP, they do not appear to be applicable to the proposed fill at Runway 22R. MassDEP has further indicated that the pile-supported structure for nonwater-dependent use proposed at the end of Runway 33L is likewise prohibited by the Waterways regulations. The project may therefore require a Variance from the Chapter 91 performance standards.

The variance provisions of the Waterways regulations are found at 310 CMR 9.21. The proposed project appears to be eligible for consideration under this provision based on its “overriding municipal, regional, state, or federal interest.” Key considerations in a variance analysis include: an analysis of alternatives that would achieve the purpose of the project without the need for a variance; minimization of detriments to the public interest in tidelands; and mitigation measures. The DEIR should examine whether there are alternatives to the placement of fill for the Runway 22R project, and if not, whether the amount of fill can be further reduced. For both runway projects, the DEIR should examine alternative configurations and alignments, if any, that meet safety objectives while minimizing impacts.

The areas in which work is proposed are not currently accessible to the public and would not be accessible to the public for the foreseeable future. These areas are within the state-legislated Logan Airport security zone restrictions on public access. This security zone extends 500 feet seaward of the high water mark. Therefore, the proposed RSA enhancements would not interfere with or restrict currently existing water-related public rights of access. However, as outlined below, the project will still need to document that it complies with the requirements for public benefits at 301 CMR 13.00.

Finally, appropriate mitigation measures for environmental and tidelands impacts should be reviewed in the DEIR.

Public Benefit Determination

In accordance with 301 CMR 13.03, the DEIR should include a chapter detailing how the project will meet the requirements for a positive Public Benefit Determination. The DEIR should include detailed information describing the nature of the tidelands affected by the project and the public benefit of the project, the purpose and effect of the project, the impact on abutters and the surrounding community, enhancement to the property, benefits to the public trust rights in tidelands or other associated rights, benefits provided through previously obtained municipal

permits, environmental protection and preservation, public health and safety, and the general welfare. I acknowledge that the proposed project presents a somewhat unique circumstance where public access to tidelands is not possible. However, the project will still need to demonstrate that the project otherwise complies with the requirement to provide public benefits.

Fisheries Species and Habitat Resources

Logan Airport is surrounded on three sides by water and supports coastal resources including coastal bank, coastal beach, intertidal mudflats, salt marshes and subtidal seagrass beds. The DEIR should provide a summary of the project site's habitat assessment. It should identify if the project will impact any state-listed species. The DEIR should explain any proposed monitoring program and describe any habitat enhancements. The DEIR should explain its proposed documentation procedures.

The intertidal mudflats surrounding Logan Airport are part of shellfish area GBH5.3, conditionally restricted, available for commercial harvest. Impacts to shellfish beds may result from any alternative with in-water construction and the ENF estimates possible impact to 67,000 sq. ft. of land containing shellfish. The Boston Harbor Association and the City of Boston have stated in their comments that in recent years, a number of shellfish beds near Logan Airport and the Town of Winthrop have re-opened to shellfishing, thanks to a cleaner Harbor. Therefore, depending upon the alternatives ultimately chosen, impacts to shellfish beds during in-water construction may occur, and shellfish beds will be lost where pilings are installed. The DEIR should thoroughly evaluate the impacts to land containing shellfish and resultant impacts to shell fishermen. To the extent any impacts result, potential mitigation measures and areas should be identified in the DEIR, in consultation with the National Marine Fisheries Service, Division of Marine Fisheries (DMF), and the City of Boston. DMF has also provided recommendations that the proponent should incorporate into the DEIR, including a recommendation that no in-water, silt producing work should be conducted from February 15th to June 30th of any year, for the protection of winter flounder.

Impacts at Runway 33L

Impacts to submerged aquatic vegetation (eelgrass) will occur at the Runway 33L end. The DEIR must include the potential impacts to eelgrass and mitigation strategies identified with the federal and state interagency eelgrass working group that has been established to address this issue. In addition, Blue mussels (*Mytilus edulis*) and soft shell clams (*Mya arenaria*) are present off Runway 33L. There are no vegetated wetlands (Salt Marsh) present at the end of Runway 33L.

The total impact to eelgrass for the Preferred Alternative is approximately 55,420 square feet of direct and indirect impacts beneath the pile supported structure at Runway 33L. The proposed project involves impacts to the most vigorous stand of eelgrass in the Boston Harbor region. At the present time, and based on preliminary studies, there appear to be few, if any, viable restoration sites where successful eelgrass transplantation and restoration would be

expected to occur. DMF recommends, and I concur, that the DEIR should contain updates on the continued dialogue with resource agencies to discuss the possibilities for mitigation of eelgrass impacts through possible direct plantings as well as alternative strategies.

The Hubline Eelgrass Mitigation Project is in the process of conducting monitoring and sediment survey work to determine the existence of possible suitable restoration sites in the Boston Harbor and Beverly area. The results of that study should be useful as a guide to frame the potential for similar eelgrass restoration work for the Massport project. As such, the DEIR should incorporate the Hubline study findings in the development of a mitigation plan for the proposed eelgrass impacts. If the Hubline study is unable to define suitable sites for eelgrass mitigation, then Massport should consult with state and federal regulatory agencies regarding the scope for the research of other suitable eelgrass-related alternative mitigation strategies.

The National Marine Fisheries Service (NMFS) has designated Essential Fish Habitat (EFH) within marine, estuarine and freshwaters of the U.S. that includes Boston Harbor. The DEIR should discuss the species and how these species will be protected during construction.

Impacts at Runway 22R

The Coastal Bank at this location is dominated by the invasive common reed (*Phragmites australis*). The ENF contains the results of Salt marsh delineations off the end of Runway 22R. Wetlands were identified based on the presence of Salt Marsh grasses (*Spartina alterniflora* and *S. patens*) and common glasswort (*Salicornia europaea*). The Coastal Beach/ Tidal Flat contains silty sand and extends seaward to the mean low water line. The ENF states that there are no eelgrass beds at the end of Runway 22R. The fill proposed off of Runway 22L may alter sediment and current dynamics in the near-shore environment. The DEIR should address this issue with a detailed evaluation and proposed measures to mitigate any impacts.

Rare Species

Review of the Massachusetts Natural Heritage Atlas indicates there is Priority Habitat in the Runway 33L RSA study area. Upland sandpiper (*Bartramia longicauda*), which is listed as endangered in Massachusetts, is known to occur in the large grassy uplands in the interior of the airfield. Massport should continue to coordinate with the U.S. Fish and Wildlife Service (USFWS), NMFS, and DMF to identify other protected species that may be found in the vicinity of the proposed RSA enhancements and the DEIR should contain the results of these discussions. The ENF stated that USFWS stated that there are no federally-listed or proposed, threatened or endangered species or critical habitat under its jurisdiction within the Runway 33L project area.

Water Quality Certification

Water Quality Certification is required from the state under Section 401 of the Clean Water Act to demonstrate that a permit issued by the USACE would not violate state water quality standards. State water quality standards contained in 314 CMR 9.00 and 314 CMR 4.00 would apply to the dredging that would be necessary to remove unsuitable substrate at the

Runway 22R end, as well as to the potential temporary construction-period increases in sedimentation and turbidity from the construction activities at the ends of both the Runway 22R and 33L. The DEIR should demonstrate that the proposed RSA enhancements for Runway 33L and Runway 22R would not increase the pollutant loading to Boston Harbor and would be designed to comply with applicable Stormwater Policy Standards.

The project will require dredging to remove structurally unsuitable substrate within Boston Harbor at the end of Runway 22R. The DEIR should contain a discussion of the volume of marine sediment to be dredged at the end of Runway 22R. The DEIR should contain a description for water quality sampling during dredging, dredge material sampling, handling, reuse/disposal requirements, and dredging performance standards.

Drainage

The DEIR should describe proposed mitigation measures to protect water quality during the construction period and, if required, post-construction. The ENF stated that the existing stormwater collection and treatment system at Logan Airport is expected to be adequate to protect receiving water quality in compliance with the Airport's National Pollutant Discharge Elimination System (NPDES) permit.

The proposed work will add 3.4 acres of new impervious surface, which qualifies the project as new development for compliance with the MassDEP Stormwater Management regulations (SMR) in 310 CMR 10.00. Stormwater runoff impacts during construction and post-construction should be evaluated in the DEIR, and it should be demonstrated that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the performance standards in the regulations. The DEIR also should explain how water quality and quantity impacts would be controlled in compliance with the SMR standards for water quality and quantity impacts and Massport's NPDES Permit. Calculations, stormwater system design plans at a readable scale, best management practice (BMP) designs and supporting information should demonstrate that the stormwater system design provides protection for wetland resources in conformance with the stormwater regulations and NPDES permit.

Proposed activities, including construction mitigation, erosion and sedimentation control, phased construction, and drainage discharges or overland flow into wetland areas, should be evaluated. The locations of detention/infiltration basins and their distances from wetland resource areas, and the expected water quality of the effluent from said basins should be identified. The drainage analysis should ensure that wetlands are not impacted by changes in stormwater runoff patterns.

Underwater Archaeological Resources

The area under the current Logan International Airport was comprised of islands and mudflats throughout most of the historic period. The Massachusetts Board of Underwater

Archaeological Resources (Board) has indicated in its record the occurrence of at least 32 shipwrecks in Boston Harbor during the period of 1738-1893. The Board cannot conclude that there are no submerged cultural resources in the proposed project area. Therefore, the Board requests that the DEIR address the potential occurrence of submerged historical cultural resources and if a submerged cultural resource is encountered during the course of the project that the proponent will take steps to limit adverse affects and notify the Board.

Construction

The DEIR should present a discussion of construction period impacts (including but not limited to noise, dust, blasting, wetlands, and traffic maintenance) and analyze feasible measures that can avoid or eliminate these impacts. Construction noise and potential nighttime light pollution should also be evaluated. The DEIR should also discuss any airfield operational impacts of the construction, such as temporary runway closures, etc. The construction schedule should be estimated, as should hours of construction. The DEIR should discuss air quality impacts from construction traffic and fugitive dust and noise, and should present a draft Construction Management Plan. One commenter, Mr. Ron Hardaway, has suggested that the proponent transport all of this equipment and material via barges to the site. The DEIR should address this request and consider transporting all or part of the needed construction equipment and materials via barge. The DEIR should also address the concerns raised in the Boston Transportation Department's (BTD) comment letter requesting a transportation access plan to keep construction traffic out of the neighborhoods surrounding Logan Airport.

Water quality in the vicinity of the proposed RSA enhancement could be temporarily impacted by short term construction activities, particularly by dredging to remove unsuitable substrate materials. These activities could result in a temporary increase in suspended sediments the area of Boston Harbor in the immediate vicinity of the proposed work. The DEIR should discuss this issue. Construction in adjacent upland areas could generate sediment from exposed soils (in the absence of mitigation), which could temporarily result in short-term increases in suspended solids in the immediate vicinity of the proposed RSA enhancement. The DEIR should propose a comprehensive Soil Erosion and Sediment Control Plan to minimize temporary impacts.

Coastal resources and benthic organisms in the immediate vicinity of the proposed RSA enhancement could also be temporarily impacted by short-term construction activities. The DEIR should discuss how construction would be under taken in a way that minimizes impacts to resources. Construction could also result in short -term increases in noise (from construction equipment) and air emissions from construction equipment.

Greenhouse Gases

The ENF indicated that the proposed project has been designed to improve safety and will not result in the increased emissions of Greenhouse Gases (GHG) and therefore falls within the

de minimis exception of the policy. Massport is not required to prepare an analysis of GHG emissions or identify measures to mitigate GHG emissions for the proposed safety project.

Mitigation

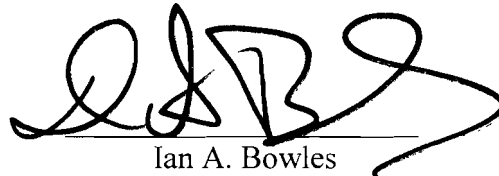
The EIR should include a separate chapter on mitigation measures. This chapter on mitigation should include proposed Section 61 Findings for all state permits. The proposed Section 61 Findings should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation should also be included, that will identify deadlines by which mitigation measures will be completed.

Response to Comments

In order to ensure that the issues raised by commenters are addressed, the EIR should include a detailed response to comments. The DEIR should include a Response to Comments section which reprints comments in their entirety. The DEIR should include responses to individual comments, in an indexed format and/or direct response to individual points within comment letters. 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.

August 14, 2009

Date



Ian A. Bowles

Comments received:

07/28/2009	The Board of Underwater Archaeological Resources
07/28/2009	Office of Coastal Zone Management
08/03/2009	Mr. Ron Hardaway
08/05/2009	Department of Environmental Protection
08/07/2009	Division of Marine Fisheries
08/10/2009	The Boston Harbor Association
08/11/2009	Boston Transportation Department
08/12/2009	City of Boston Environmental Department

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Appendix 3

Response to Comments on the Draft EA/EIR



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Response to 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 CMR 11.07(6)(l), this appendix includes Massport's responses to comments received on the Draft Environmental Impact Report (EIR) filed with the MEPA Office on July 15, 2010. Delineated letters are included in the appendix followed by responses to each comment. Table A3.1-1 presents the agencies and/or individuals that provided written comments on the Draft EIR. Responses to comments in the Secretary's Certificate on the Draft EIR are included in Appendix 2.

Table A3.1-1 EIR Commenter

Comment Letter	Commenter
B	United States Environmental Protection Agency
C	National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Protected Resources
D	National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Habitat Conservation
E	United States Army Corps of Engineers
F	Massachusetts Board of Underwater Archaeological Resources
G	Massachusetts Office of Coastal Zone Management
H	Massachusetts Department of Environmental Protection
I	Massachusetts Division of Marine Fisheries
J	Boston Environment Department
K	Boston Transportation Department
L	Boston Harbor Association
M	Ms. Gail Miller



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square, Suite 100
BOSTON, MA 02109-3912

September 1, 2010

Secretary Ian A. Bowles
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114
ATTN: Ann Canaday, EOEEA No. 14442

The U.S. Environmental Protection Agency (EPA) has reviewed the Environmental Assessment/Draft Environmental Impact Report (EA/DEIR) for the Boston-Logan International Airport Runway Safety Area Improvements Project (“the RSA Project”) and offers the following comments relative to the potential adverse impacts to aquatic resources and compensatory mitigation for those impacts.

The EA/DEIR adequately describes the need for the proposed improvements at the Runway 33L and 22R ends. The proposed improvements appear to include all practicable methods to reduce the adverse impacts to aquatic resources. Principal among these measures is the proposal to construct a new pile-supported deck at Runway-End 33L. While this pile-supported deck avoids direct filling of the harbor’s aquatic resources, thereby reducing potential impacts on coastal processes such as waves and currents, it still would result in a loss of 66,600 square feet of eelgrass habitat, and 4,320 square feet of coastal beach, land under the ocean, and land containing shellfish (Table 4.4-1).¹ Eelgrass serves a wide variety of ecological functions, including providing important spawning and nursery habitat for a wide variety of fish and invertebrates. The eelgrass meadow at the end of Runway 33L is one of the few natural meadows left in Boston Harbor. In addition, its location in the northern part of the harbor makes it even more important as net water circulation in the harbor is north to south, thus this meadow could be a seed source for natural recolonization of other areas of the harbor as water clarity continues to improve.

At the Runway-End 22R, an Inclined Safety Area (ISA) is proposed which is very similar to the previously permitted and constructed ISA at the Runway-End 22L. The filling for the ISA will impact approximately 1.9 acres of coastal wetland resources. Table 4.4-1 on page 4-109 of the DEIR lists the individual coastal resource impacts as including 35,040 square feet of salt marsh, 26,630 square feet of coastal beach (mudflat), 700 square feet

B-1



¹ Table 4.2-1 on page 4-13 of the DEIR presents a slightly different total for direct wetland impacts for Runway-End 33L. It appears that Table 4.2-1 includes the area of the pile supports for the deck while this area seems to have been left out of the impact areas listed in Table 4.4-1.

of land under water, and 67,990 square feet of land containing shellfish. However, the narrative regarding project impacts in Section 4.4.2.2 mentions 27,820 square feet of salt marsh impact. The Final EIR should clarify the discrepancy between the narrative and table. The Final EIR should also clarify a discrepancy between the impact area for land containing shellfish (67,990 square feet) and the impact area for salt marsh (35,040 square feet), as the sum of these two exceeds the 1.9 acres of total coastal wetland resource impact listed for the Runway-End 22R. These clarifications will be helpful in planning for adequate and appropriate aquatic resource mitigation.

B-1 cont'd.

An additional concern is that the placement of new hard substrate in the harbor represents an opportunity for colonization by invasive species (tunicates in particular). The Final EIR should discuss the potential for colonization by invasives and the potential adverse impacts.

B-2

Compensatory mitigation for unavoidable impacts to aquatic resources is only presented in a conceptual manner. Numerous potential salt marsh mitigation sites were evaluated and a preferred site has not been proposed. It is important to include appropriate and practicable compensation for the mudflat intertidal habitat in the detailed design of mitigation sites. The preferred salt marsh mitigation sites presented in the DEIR offer several opportunities for different design considerations to mitigate this impact. Salt marsh pools and pannes, for instance, should be considered in salt marsh mitigation designs for high salt marsh areas. On the other hand, marsh pools and pannes would not adequately compensate for lost functions and values of mudflats. A site involving enhancement of an existing wetland, such as the VHB-5 site (phase 3 Neponset River salt marsh restoration), may not provide adequate opportunities for mudflat mitigation. The EPA Rumney Marsh salt marsh mitigation sites which were retained for further consideration offer opportunities for intertidal habitat creation in the design. However, adequate compensation for the lost mudflats at Runway-End 22L may not be possible at the Rumney Marsh sites because fill removal and grading alone would likely only expose a sandy or gravelly substrate. These issues will need further consideration in the Final EIR.

B-3

Compensatory mitigation for eelgrass impacts is also presented in a conceptual manner, and the details still need to be developed. EPA will continue to work with Massport as the details of this plan evolve. As we have discussed in past meetings, Massport should anticipate a post-construction monitoring program to more precisely quantify impacts to eelgrass. The mitigation burden will be linked to the results of this monitoring effort.

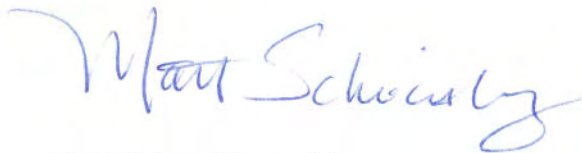
B-4

Eelgrass restoration is still a very uncertain science, with many more failures than successes. EPA understands that Massport intends to invest in some additional data collection for site selection, which we believe is a wise step. The more thorough the information collected upfront, the greater the chances of success in transplanting. EPA recommends that Massport collaborate and share data with the Massachusetts Division of Marine Fisheries, who will be attempting eelgrass restoration in the same system.

B-5

EPA will continue to participate in the interagency Working Groups for compensatory mitigation planning. Further field level assessment, including interagency site visits, will be needed as this planning continues. Please contact Ed Reiner of my staff at 617-918-1692 for continued coordination on salt marsh and intertidal habitat mitigation planning. For eelgrass mitigation planning, please coordinate with Phil Colarusso of EPA's Marine and Ocean Program at 617-918-1506.

Sincerely,



Matt Schweisberg, Manager
Wetlands Protection Unit

cc: Mel Cote, OCPU, EPA
USACE, Concord, MA
USFWS, Concord, NH
USNMFS, Gloucester, MA
MADEP, Boston, MA
MADMF, Boston, MA

Comment #	Author	Comment	Response
B.1	EPA	Table 4.4-1 on page 4-109 of the DEIR lists the individual coastal resource impacts as including 35,040 square feet of salt marsh, 26,630 square feet of coastal beach (mudflat), 700 square feet of land under water, and 67,990 square feet of land containing shellfish. The Final EIR should clarify the discrepancy between the narrative and table. The Final EIR should also clarify a discrepancy between the impact area for land containing shellfish (67,990 square feet) and the impact area for salt marsh (35,040 square feet), as the sum of these two exceeds the 1.9 acres of total coastal wetland resource impact listed for the Runway-End 22r. These clarifications will be helpful in planning for adequate and appropriate aquatic resource mitigation.	The Final EA/EIR clarifies the impacts to coastal wetland resources at the Runway 33L and Runway 22R ends. The numbers presented in Table 4.4-1 of the Draft EA/EIR were incorrect. The correct impact areas for Runway 33L and Runway 22R are shown in Chapter 4, <i>Environmental Consequences</i> , Table 4.2-1 and Table 4.3-1, respectively. The cumulative impacts are presented in Table 4.4-1 of Chapter 4. It should be noted that Land Containing Shellfish overlays Coastal Beach and Land under the Ocean and is not a separate geographic area. This is clarified in the Final EA/EIR text and tables.
B.2	EPA	An additional concern is that the placement of new hard substrate is the harbor represents an opportunity for colonization by invasive species (tunicates in particular). The Final EIR should discuss the potential for colonization by invasive and the potential adverse impacts.	There is no evidence in Boston Harbor of invasive tunicates (<i>Didemnum vexillum</i>) currently colonizing hard surfaces or adjacent shellfish beds, indicating that this indirect adverse effect is not predictable at this time. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , outlines a post-construction monitoring program to evaluate the use of pilings and other hard surfaces by shellfish and invasive species.
B.3	EPA	It is important to include appropriate and practicable compensation for the mudflat intertidal habitat in the detailed design of mitigation sites. The preferred salt marsh mitigation sites presented in the DEIR offer several opportunities for different design considerations to mitigate this impact. Salt marsh pools and pannes, for instance, should be considered in salt marsh mitigation designs for high salt marsh areas. On the other hand, marsh pools and pannes would not adequately compensate for lost functions and values of mudflats. A site involving enhancement of an existing wetland, such as VHB-5 site (phase 3 Neponset River salt marsh restoration), may not provide adequate opportunities for mudflat mitigation. The EPA Rumney Marsh salt marsh mitigation sites which were retained for further consideration offer opportunities for intertidal habitat creation in the design. However, adequate compensation for the lost mudflats at Runway-End 22R may not be possible at the Rumney Marsh sites because fill removal and grading alone would likely only expose a sandy or gravelly substrate. These issues will need further consideration in the Final EIR.	The proposed salt marsh restoration plan, provided in Chapter 5, <i>Proposed Mitigation and Chapter 61 Findings</i> , includes measures to create intertidal mud flats at Rumney Marsh, similar to the intertidal clam flats previously constructed at this location.
B.4	EPA	Compensatory mitigation for eelgrass impacts is also presented in a conceptual manner, and the details still need to be developed. EPA will continue to work with Massport as the details of this plan evolve. As we have discussed in past meetings, Massport should anticipate a post-construction monitoring program to more precisely quantify impacts to eelgrass.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , presents the proposed eelgrass mitigation plan. Massport proposes to transplant eelgrass harvested from the deck footprint and transplant it at White Head Flats and at Old Harbor. This mitigation program received consensus from the Eelgrass Working Group at the December 2010 meeting. A post-construction monitoring program is proposed at the transplant sites and at the Runway 33L bed as documented in Chapter 5.
B.5	EPA	EPA recommends that Massport collaborate and share data with the Massachusetts Division of Marine Fisheries, who will be attempting eelgrass restoration in the same system.	Massport has been collaborating with the Massachusetts Division of Marine Fisheries (DMF) as well as the entire Eelgrass Working Group on eelgrass mitigation. As described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , Massport's eelgrass mitigation site selection survey was based on previous work by DMF and reviewed in advance with the interagency Working Group. Massport will continue to coordinate with the DMF, EPA and other WG members as the proposed mitigation moves forward.

AC



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JUL 26 2010

Ian A. Bowles, Secretary
Executive Office of Energy
and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114
Attn: MEPA Office
Anne Canaday, EEA No. 14442

Mr. Richard Doucette
Federal Aviation Administration
New England Region
12 New England Executive Park Drive
Burlington, Massachusetts 01803

Re: Draft Environmental Assessment/ Environmental Impact Report for the Boston-Logan International Airport Runway Safety Area Improvement Project

Dear Secretary Bowles and Mr. Doucette,

This is in response to your letter dated July 15, 2010 requesting comments on Draft Environmental Assessment/ Environmental Impact Report for the Boston-Logan International Airport Runway Safety Area Improvement Project. As Section 7 consultation was recently completed between NMFS and the FAA, with a July 23, 2010 letter from NMFS to the FAA as the lead action agency indicating that NMFS concurred with the FAA's determination that proposed Boston-Logan International Airport Runway Safety Area Improvement Project is not likely to adversely affect any listed species under our jurisdiction, NMFS Protected Resources Division does not intend to offer any additional comments on this proposal. Should you have any questions about this correspondence please contact Danielle Palmer at (978) 282-8468 or by e-mail (Danielle.Palmer@Noaa.gov).

C-1

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

RECEIVED

JUL 27 2010

MEPA

File Code: Sec 7 Technical Assistance 2010
PCTS: I/NER/2010/01025



Comment #	Author	Comment	Response
C.1	NMFS Protected Resources	As Section 7 consultation was recently completed by NMFS and the FAA, with a July 23, 2010 letter from NMFS to the FAA as the lead action agency indicating that NMFS concurred with the FAA's determination that proposed Boston-Logan International Airport Runway Safety Area Improvement Project is not likely to adversely affect any listed species under our jurisdiction, NMFS Protected Resources Division does not intend to offer any additional comments on this proposal.	Massport acknowledges the comment from NMFS Protected Resources.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

Mr. Richard Doucette
Federal Aviation Administration
New England Region
12 New England Executive Park Drive
Burlington, MA 01803

SEP 2 2010

Secretary Ian A. Bowles
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
Anne Canaday, EEA No. 14442
100 Cambridge Street, Suite 900
Boston, MA 02114

**RE: Boston-Logan International Airport Runway Safety Area Improvements Projects
(EEA File #14442)**

Dear Sirs:

The National Marine Fisheries Service (NMFS) has reviewed the joint Draft Environmental Assessment (DEA)/Draft Environmental Impact Report (DEIR) submitted by the Federal Aviation Administration (FAA) and the Massachusetts Port Authority (MassPort) for the proposed Boston-Logan International Airport Runway Safety Area (RSA) Improvements Project in East Boston, Massachusetts. The proposed project includes the construction of a pile supported pier and placement of fill at the end of runway 33L as well as dredging and the placement of fill associated with the construction of an inclined safety area (ISA) at the end of runway 22R. Based on the DEA/DEIR, the project would impact approximately 66,600 square feet (SF) of eelgrass, 26,630 SF of intertidal mudflat, 35,040 SF of salt marsh, and 67,990 SF of areas containing shellfish resources. To compensate for the loss of fishery habitat and resources, the applicant is proposing compensatory mitigation.

As you are aware, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require Federal agencies to consult with one another on projects such as this. Insofar as a project involves essential fish habitat (EFH), as this project does, this process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH Assessments and generally outlines each agencies obligations in this consultation procedure. We offer the following comments and recommendations on this project pursuant to the above referenced regulatory process.

General Comments

Based on our involvement in the project planning process, NMFS concurs that the applicant has considered all practicable alternatives to avoid and minimize impacts to the aquatic environment, most notably due to the design change from a solid fill structure to an open pile-supported pier at the end of runway 33L. While the proposed pile-supported pier at the end of runway 33L avoids significant impacts that would result from filling of the harbor, the pile supported pier at 33L and the construction of the ISA at 22R will result in unavoidable adverse impacts to marine resources and habitats, including eelgrass, intertidal mudflats and salt marsh. Each of these resources have been designated as special aquatic sites pursuant to section 404(b)(1) of the Federal Clean Water Act, due to their importance to the marine ecosystem. These resources serve as habitat for a broad range of federally managed fishery resources, including but not limited to winter flounder, scup, black sea bass, and summer flounder. Furthermore, shellfish resources that would be impacted by the project include blue mussel, and soft shelled clams.

As noted in table 4.2-1 of the DEA/DEIR, impacts associated with the proposed pile supported pier at the end of 33L includes the loss of 66,600 square feet of eelgrass habitat due to shading, and 4,320 square feet of intertidal mudflat (coastal beach) habitat due to the installation of piles and emergency access ramps. Table 4.4-1 of the DEA/DEIR however, states that impact to intertidal mudflat (coastal beach) is limited to 2,080 SF. Furthermore, the impacts to intertidal mudflat associated with runway 33L do not appear to be included in the overall impact calculation. Total resource areas to be impacted should be clarified in the Environmental Assessment (EA)/Final Environmental Impact Report (FEIR) for the purposes of adequate compensatory mitigation.

D-1

Table 4.3-1 of the DEA/DEIR describes impacts associated with the ISA construction at the end of runway 22R. Dredging and subsequent filling for the ISA will impact approximately 35,040 SF of salt marsh, 26,630 SF of intertidal mudflat (coastal beach), 700 SF of subtidal impacts (land under water) and 67,990 SF of land containing shellfish. Dredging and filling of these areas will result in direct loss of resource functions and values that are important for federally managed fishery resources. In addition, the dredging and filling associated with this project can result in elevated levels of suspended sediment that can adversely affect winter flounder eggs and larvae. As such, seasonal work restrictions should be utilized in order to minimize adverse effects.

D-2

The DEA/DEIR provides general information regarding compensatory mitigation to offset both eelgrass and salt marsh resources, and has been the subject of multiple interagency work groups. While these meetings have provided the FAA and MassPort with guidance as to preferred compensatory mitigation options, consensus on final mitigation plans has not been reached. In order to determine adequate and appropriate compensatory mitigation for eelgrass and salt marsh resources, further interagency coordination should occur. With regard to intertidal mudflat resources, the DEA/DEIR does not include proposals to offset intertidal mudflat functions and values. The document suggests that adverse impacts to intertidal mudflat habitat may be compensated for by the creation of salt marsh. NMFS maintains that the creation of additional salt marsh will not adequately offset the functions and values of intertidal mudflat.

D-3

D-4

Within the broader salt marsh mitigation site however, there may be opportunities to incorporate intertidal mudflat mitigation. Further evaluation of specific sites should be evaluated within the EA/FEIR.

Essential Fish Habitat Conservation Recommendations

While a separate and distinct Essential Fish Habitat (EFH) Assessment is not included in the document, the required information for a complete and appropriate EFH assessment is provided within the DEA/DEIR. As noted in the DEA/DEIR, this portion of Boston Harbor has been designated as EFH under the MSA for a range of federally managed fish species including, but not limited to winter flounder (*Pseudopleuronectes americanus*), windowpane flounder (*Scopthalmus aquosus*), summer flounder (*Paralichthys dentatus*), scup (*Stenotomus chrysops*), and black sea bass (*Centropristis striata*). The proposed project would adversely affect EFH by filling intertidal mudflat and salt marsh resources that are used for spawning, forage and shelter for a variety of the above species. Submerged aquatic vegetation (eelgrass), a Habitat Area of Particular Concern for summer flounder, would also be negatively impacted due to shading at the end of runway 33L. NMFS recommends pursuant to Section 305(b)(4)(A) of the MSA that the FAA adopt the following EFH Conservation Recommendations:

- 1) In order to avoid adverse impacts to winter flounder spawning and juvenile development, no in-water sediment producing activity should occur between February 15 – June 30.
- 2) Compensatory mitigation for adverse impacts to eelgrass, salt marsh and intertidal mudflat should be required. Further consultation with Federal and State resource agencies on the development of a compensatory mitigation plan should occur prior to construction of the proposed project.

Please note that Section 305(b)(4)(B) of the MSA requires the FAA to provide NMFS with a detailed written response to these EFH Conservation Recommendations, including a description of measures adopted by the FAA for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendations, Section 305(b)(4)(B) of the MSA also indicates that the FAA must explain its reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with NMFS over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(l) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH Conservation Recommendations.

Fish and Wildlife Coordination Act Recommendations

As noted above, the proposed project will adversely affect a range of shellfish resources, due to filling of intertidal resource areas. Shellfish in this area provide an important resource to commercial shellfishermen on a conditionally restricted basis, and serve as prey for a number of

federally managed species. In order to offset these impacts to shellfish resources, compensatory mitigation should be required. Further consultation with Federal and State resource agencies on the development of a compensatory mitigation plan should occur prior to construction of the proposed project.

Conclusions

As noted above, the proposed project will result in significant adverse impacts to fishery resources and habitats, including eelgrass, salt marsh, intertidal mudflat, and shellfish resources. In order to determine the full scope of impacts to these important resources, the total areas of impacts should be included within the EA/FEIR. NMFS recommends that no in-water work should occur between February 15 - June 30, in order to minimize adverse affects to winter flounder. In addition, NMFS recommends that suitable and adequate compensatory mitigation be required to offset adverse impacts to eelgrass, salt marsh, intertidal mudflat and shellfish resource. Further consultation with appropriate federal and state resources regarding mitigation options will be necessary. If you would like further information regarding these comments, please contact Christopher Boelke at 978-281-9131.

Sincerely,



Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

cc: ACOE, Karen Adams
US EPA, Matt Schweissberg
US FWS, Thomas Chapman

Comment #	Author	Comment	Response
D.1	NIMFS Habitat Conservation	As noted in Table 4.2-1 of the DEA/DEIR, impacts associated with the proposed pile supported pier at the end of 33L includes the loss of 66,600 square feet of eelgrass habitat due to shading, and 4,320 square feet of intertidal mudflat (coastal beach) habitat due to the installation of piles and emergency access ramps. Table 4.4-1 of the DEA/DEIR however, states that impact to intertidal mudflat (coastal beach) is limited to 2,080 SF. Furthermore, the impacts to intertidal mudflat associated with runway 33L do not appear to be included in the overall impact calculation. Total resource areas to be impacted should be clarified in the Environmental Assessment (EA)/ Final Environmental Impact Report (FEIR) for the purposes of adequate compensatory mitigation.	The Final EA/EIR clarifies the impacts to coastal wetland resources at the Runway 33L and Runway 22R ends. The numbers presented in Table 4.4-1 of the Draft EA/EIR were incorrect. The correct impact areas for Runway 33L and Runway 22R are shown in Chapter 4, <i>Environmental Consequences</i> , Table 4.2-1 and Table 4.3-1, respectively. The cumulative impacts are presented in Table 4.4-1 of Chapter 4.
D.2	NIMFS Protected Resources	In addition, the dredging and filling associated with this project can result in elevated levels of suspended sediment that can adversely affect winter flounder eggs and larvae. As such, seasonal work restrictions should be utilized in order to minimize adverse effects.	Massport has committed to no in-water, silt-producing work between February 15th and June 30th for the protection of winter flounder and other marine species. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
D.3	NIMFS Protected Resources	The DEA/DEIR provides general information regarding compensatory mitigation to offset both eelgrass and salt marsh resources, and has been the subject of multiple interagency work groups. While these meetings have provided FAA and MassPort with guidance as to preferred compensatory mitigation options, consensus on final mitigation plans has not been reached. In order to determine adequate and appropriate compensatory mitigation for eelgrass and salt marsh resources, further interagency coordination should occur.	Since the publication of the Draft EA/EIR, Massport has met jointly with the Salt Marsh and Eelgrass Working Group on two occasions in August and December 2010. At the December 2010 meeting, consensus was reached on eelgrass and salt marsh mitigation. On January 5, 2011 a site visit was conducted in Rumney Marsh, the preferred location for salt marsh mitigation, which was attended by Massport, DCR, DEP, CZM, USACE, EPA, and the Saugus Conservation Commission. Massport anticipates continued coordination with the Working Groups during the permitting process as well as through construction and post-construction monitoring. Please refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information on the proposed mitigation program for eelgrass and salt marsh.
D.4	NIMFS Protected Resources	With regard to intertidal mudflat resources, the DEA/DEIR does not include proposals to offset intertidal mudflat functions and values. The document suggests that adverse impacts to intertidal mudflat habitat may be compensated for by the creation of salt marsh. NIMFS maintains that the creation of additional salt marsh will not adequately offset the functions and values of intertidal mudflat. Within the broader salt marsh mitigation site however, there may be opportunities to incorporate intertidal mudflat mitigation. Further evaluation of specific sites should be evaluated within the EA/FEIR.	The proposed salt marsh restoration plan, provided in Chapter 5, <i>Proposed Mitigation and Chapter 61 Findings</i> , includes measures to create intertidal mud flats at Rumney Marsh, similar to the intertidal clam flats previously constructed at this location.
D.5	NIMFS Protected Resources	NIMFS recommends pursuant to Section 305(b)(4)(A) of the MSA that the FAA adopt the following EFH Conservation Recommendations: 1. In order to avoid adverse impacts to winter flounder spawning and juvenile development, no in-water sediment producing activity should occur between February 15 - June 30. 2. Compensatory mitigation for adverse impacts to eelgrass, salt marsh and intertidal mudflat should be required. Further consultation with Federal and State resource agencies on the development of a compensatory mitigation plan should occur prior to construction of the proposed project.	Massport has committed to no in-water, silt-producing work between February 15th and June 30th for the protection of winter flounder and other marine species. Massport has proposed a comprehensive mitigation program for eelgrass, salt marsh, shellfish, and intertidal mudflat to offset the anticipated impacts to these resources. Development of the mitigation program has occurred in conjunction with the resource agencies, and continued coordination through the permitting process would occur. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.

Comment #	Author	Comment	Response
D.6	NIMFS Protected Resources	Please note that Section 305(b)(4)(A) of the MSA requires the FAA to provide NIMFS with a detailed written response to these EFH Conservation Recommendations, including a description of measures adopted by the FAA for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of are response that is inconsistent with NIMFS' recommendations, Section 305(b)(4)(B) of the MSA also indicates that the FAA must explain its reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with NIMFS over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).	Massport has accepted the EFH Conservation Recommendations provided by NIMFS. A full description of the proposed mitigation is provided in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
D.7	NIMFS Protected Resources	In order to offset these impacts to shellfish resources, compensatory mitigation should be required. Further consultation with Federal and State resource agencies on the development of a compensatory mitigation plan should occur prior to construction of the proposed project.	Mitigation for shellfish resources has been developed in conjunction with the resource agencies. Local shellfishermen were able to provide input into the proposed mitigation at a briefing held by Massport in December 2010. Massport expects to continue discussions with the DMF and shellfishers during the Final EA/EIR review. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

August 23, 2010

Regulatory Division
CENAE-R-2007-2676

RE: Logan International Airport, Runway Safety Improvements Project
Draft Environmental Assessment/Environmental Impact Report (EEA File #14442)

Mr. Richard Doucette
Federal Aviation Administration
New England Region
12 New England Executive Park Drive
Burlington, MA 01803

Dear Mr. Doucette:

Our office has reviewed the Draft Environmental Assessment/Environmental Impact Report (Draft EA/EIR) for the *Boston-Logan International Airport Runway Safety Area Improvements Project* to dredge, install structures and place fill material within Boston Harbor for the enhancement of runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R. As noted in your EA/EIR, this work will require both a Section 10 Rivers and Harbors Act and Section 404 Clean Water Act permit from our office. One of the stated goals of the FAA Order 1050.1E, which is referenced in this EA, is to assure that permits will be issued with or immediately following completion of the EA and that “the responsible FAA official should (1) identify the timeframes established for review by the oversight agency; (2) identify the information that the FAA will need to provide to the oversight agency to complete its review; and (3) integrate these into the EA process.” In order to meet this goal and assure an expedited permit review, the following additional information should be included in your EA.

1. State jurisdictional terms are well defined throughout the document to describe and quantify impacts. If your intent is for the EA/EIR to be utilized in the review of the Corps Federal permit process, then Federal Jurisdictional boundaries should also be identified in a similar manner and impacts quantified based on these boundaries. For example, page 2-23 states the existing riprap slope between the perimeter road and the intertidal areas would be replaced with a filled sheet-pile structure protected with riprap. The high tide line should be added to the plans so it will be clear if the filled sheet pile structure with riprap will require a Section 404 permit and if so, indicate the size of the proposed area to be filled. I also recommend a table be provided that summarizes the area (in square feet or acres) and type of Federal resource areas to be filled that will require a Section 404 permit and another table summarizing the Section 10 dredging as well as all structures with associated dimensions and distance beyond the mean high water line.

E-1

E-2

E-3

Another example of the need to clarify Federal jurisdictional areas is on Page 3-4 where it is stated that wetlands within the Study Area are protected by Section 404 of the Clean Water Act as waters of the United States and Section 404 jurisdiction includes the areas of Coastal Beach, Salt Marsh, and Land Under the Ocean protected by the Massachusetts Wetland Protection Act. However, Table 4.2-1 on page 4-14 indicates that direct wetland impacts for Runway 33L on land containing shell fish as being solely within State jurisdiction. If this area is below the high tide line, then the table should be corrected to include impacts to Federal resource areas.

E-4

2. Section 6.2 of the EA discusses the Corps permit process as well as the requirements to comply with the EPA Section 404(b)(1) guidelines. I recommend that the EA include the information in the attached Army Corps Section 404 guideline checklist.
3. Page S-15 mentions proposed installation of storm water treatment units at outfalls. Are these in Federal jurisdictional areas and what resources, if any, would be impacted?
4. The EA provides a preliminary Essential Fish Habitat (EFH) assessment and indicates on page S-14 that “The safety improvements are not anticipated to have permanent impacts to fish habitat at the Runway 33L end. There are no permanent impacts to EFH.” The Corps public notice for this project will also require coordination with the National Marine Fisheries Service on the EFH assessment. For projects such as this with impacts to eelgrass, intertidal areas and salt marsh, an expanded EFH assessment would normally be included as a separate document attached to the Corps application and we recommend it also be included as an appendix to the EA.
5. Sections 2.2, 2.3 and Section 5.2 discuss efforts to minimize impacts to resource areas. FAA has determined for the RSA design at runway 33L that width “Reductions below 300 feet are unacceptable due to the need for a corridor on either side of the EMAS bed for emergency response and maintenance vehicles to safely maneuver and turn around without risk of driving off an over the water platform.” The 300 foot wide deck will have a 65 foot wide corridor. Further details on the type of emergency vehicles expected to utilize the corridor and factors that affect mobility should be provided to further document the need for the proposed corridor width.
6. Page 4-118 states that Wetlands and Waterways impacts will not be significant assuming mitigation would be provided consistent with state and federal requirements that would reduce the level of impact to less than significant. In order to support this assumption the EA should have detailed mitigation plans that meet the Corps requirements. An updated checklist for the required Corps mitigation plan development can be found at <http://www.nae.usace.army.mil/reg/10/spn072010.pdf>.
7. The Corps EA format/checklist required for this type of project has been attached. I recommend that the information required to complete this Corps EA should be included within your NEPA documents and referenced in a manner similar to the ENF Certificate

E-5

E-6

E-7

E-8

E-9

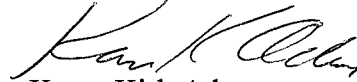
E-10

requirements checklist on page S-28, with specific attention being given to the Corps cumulative impacts assessment section.

↑ E-10
cont'd.

If you have any questions concerning this matter, please contact Ted Lento, Regulatory Division project manager, at (978) 318-8863.

Sincerely,



Karen Kirk Adams
Chief, Permits & Enforcement Branch
Regulatory Division

Copy Furnished:

Anne Canaday
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Stewart Dalzell
Deputy Director, Environmental Planning and Permitting
Massachusetts Port Authority
One Harborside Drive, Suite 2008
East Boston, MA 02128-2909

DEPARTMENT OF THE ARMY
PERMIT EVALUATION AND DECISION DOCUMENT
New England District

:

This document constitutes the Environmental Assessment, Statement of Findings, and review and compliance determination according to the 404(b)(1) Guidelines for the proposed work (applicant's preferred alternative).

1. Authority

This permit action is being taken under authority delegated to the District Engineer by 33 CFR 325.8, pursuant to:

- _____ Section 10 of the Rivers and Harbors Act of 1899 (*Public interest review factors only*)
- _____ Section 404 of the Clean Water Act (*Public interest review and 404(b)(1) factors*)
- _____ Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972

2. Proposed Project

- a. Project Description:
- b. Location:
- c. Scope of Analysis:
- d. Purpose and Need:
 - i. Project need as evaluated by the Corps:
 - ii. Basic Project Purpose:
 - iii. Water dependency [40 CFR 230.10(a)(3)]:
 - iv. Overall project purpose as determined by the Corps:
- e. Site description:

3. Alternatives Considered [33 CFR 320.4(b)(4), 40 CFR 230.10, 40 CFR 1502.14]

- a. No action:
- b. Alternative, etc.

4. Mitigation [33 CFR 320.4(r); 40 CFR 230.70-77 and 230.90-99; 40 CFR 1504.12(f)]

- a. Minimization –
- b. Measures to minimize adverse effects –
- c. Mitigation –

5. Public Involvement

A complete application was received on _____. The public notice was issued on _____. The comment period ended on _____.

- a. Comments received:
 - i. Federal Agencies:
 - ii. State and local agencies: State water quality certification _____.
 - iii. Organizations and individuals:
- b. Requests for public hearing:
- c. Evaluation and Consideration of Comments:

6. Analysis of Beneficial and Detrimental Impacts to the Environment and the Public Interest, and Factual Determinations for Discharges of Dredged or Fill Material

[33 CFR 320.4(a-r), 33 CFR 325 App B, and 40 CFR 230.11 and 230.20 - 230.77]

- a. Public interest review factors (33 CFR 320.4(a)(1))
 - i. Conservation:
 - ii. Economics:
 - iii. Aesthetics:
 - iv. General environmental concerns:
 - v. Wetlands:
 - vi. Historic properties:
 - vii. Fish and wildlife values:
 - viii. Flood hazards:
 - ix. Floodplain values:

- x. Land use:
 - xi. Navigation:
 - xii. Shore erosion and accretion:
 - xiii. Recreation:
 - xiv. Water supply and conservation:
 - xv. Water quality:
 - xvi. Energy needs:
 - xvii. Safety:
 - xviii. Food and fiber production:
 - xix. Mineral needs:
 - xx. Considerations of property ownership:
- b. Additional Public Interest Review General Criteria (33 CFR 320.4(a)(2):
- i. The relative extent of the public and private need for the proposed work:
 - ii. The practicability of using reasonable alternative locations and/or methods to accomplish the objective of the proposed structure or work:
 - iii. The extent and permanence of the beneficial and/or detrimental effects that the proposed structures or work may have on the public and private uses which the area is suited:
- c. Section 404(b)(1) Guidelines Impact Analysis (Subparts C-F)
- i. Substrate:
 - ii. Suspended particulates/turbidity:
 - iii. Water:
 - iv. Current patterns and water circulation:
 - v. Normal water level fluctuations:

- vi. Salinity gradients:
- vii. Threatened and endangered species:
- viii. Fish, crustaceans, mollusks, and other aquatic organisms in the food web:
- ix. Other wildlife:
- x. Special aquatic sites:
 - 1. Sanctuaries and refuges:
 - 2. Wetlands:
 - 3. Mud flats:
 - 4. Vegetated shallows:
 - 6. Coral reefs:
 - 7. Riffle and pool complexes:
- xi. Municipal and private water supplies:
- xii. Recreational and commercial fisheries:
- xiii. Water-related recreation:
- xiv. Aesthetics:
- xv. Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar areas:

7. Endangered Species Act.

8. Essential Fish Habitat

9. Historic Properties

10. Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians

11. Impact Analysis

SECONDARY AND CUMULATIVE IMPACTS 230.11(g) and 230.11(h) (effects on the aquatic ecosystem, associated with discharge of fills), also 320.4(a)(1):

12. Section 176(C) of the Clean Air Act General Conformity Rule Review:

The EPA regulations published as “General Conformity Rule” (58 FR 63214, November 30, 1993) to implement section 176(c) of the Clean Air Act for non-attainment areas and maintenance areas require that Federal actions, unless exempt, conform with the Federally approved state implementation plan. The impacts on air quality associated with the regulated activity described in this EA/SOF (discharge of dredged or fill material into waters of the U.S. (Section 404 of the Clean Water Act) have been considered and will not exceed levels of direct emissions of a criteria pollutant or its precursor, and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps continuing program responsibilities, and generally cannot be practicably controlled by the Corps. Therefore, a conformity determination is not required.

13. Special Conditions and Rationale for Inclusion

a. The following special conditions were included in the State Section 401 Water Quality Certification:

b. The following special conditions will be included in the permit to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], to ensure the project complies with the 404 (b)(1) Guidelines [40 CFR 230.10(d)], requirements pertaining to compensatory mitigation for losses of aquatic resources [33 CFR 320.4(r)(2)] and/or as per the permittee’s request [33 CFR 325.4 (b)].

- i.
- ii. ETC.

14. Compliance with Other Federal, State, or Local Laws

- a. State 401 Water Quality Certification:
- b. State and/or local authorizations (if issued):
- c. Environmental justice issues (E.O. 12898):

15. Determinations

a. Public Interest Determination: I find that issuance of a Department of the Army permit, as prescribed by regulations published in 33 CFR 320 to 330, and 40 CFR 230:

[] Is not contrary to the public interest (with the inclusion of special permit conditions described in section 6.3 of this document).

[] Is contrary to the public interest.

b. Evaluation of Compliance with 404(b)(1) Guidelines:

i. Alternatives Test (40 CFR 230.10(a)):

Based on the discussion in II.B., are there available, practicable alternatives having less adverse impact on the aquatic ecosystem and without other significant adverse environmental consequences that do not involve discharges into “waters of the U.S.” or at other locations within these waters?

[Explain and provide or reference documentation.]

Based on II.B., if the project is in a special aquatic site and is not water dependent, has the applicant clearly demonstrated that there are no practicable alternative sites available?

[Explain and provide or reference documentation.]

ii. Special Restrictions (40 CFR 230.10(b)). Will the discharge:

Violate state water quality standards?

[Explain and provide or reference documentation]

Violate toxic effluent standards [under Section 307] of the Clean Water Act?

[Explain and provide or reference documentation]

Jeopardize endangered or threatened species or their critical habitat?

[Explain and provide or reference documentation]

Violate standards set by the Department of Commerce to protect marine sanctuaries?

[Explain and provide or reference documentation]

iii. Other restrictions (40 CFR 230.10(c)): Will the discharge contribute to significant degradation of “waters of the U.S.” through adverse impacts to:

Human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and/or special aquatic sites?

[Explain and provide or reference documentation]

Life stages of aquatic life and/or wildlife?

[Explain and provide or reference documentation]

Diversity, productivity, and stability of the aquatic life and other wildlife? Or wildlife habitat or loss of the capacity of wetlands to assimilate nutrients, purify water or reduce wave energy?

[Explain and provide or reference documentation]

Recreational, aesthetic, and/or economic values?

[Explain and provide or reference documentation]

iv. Actions to minimize potential adverse impacts [mitigation](40 CFR

230.10(d))? Will all appropriate and practicable steps [40 CFR 230.70-77] be taken to minimize adverse impacts of the discharge on the aquatic ecosystem? Does the proposal include satisfactory compensatory mitigation for losses of aquatic resources [33 CFR 332, 40 CFR 230, Subpart J]?

Explain and provide or reference documentation

c. Findings of Compliance or Non-compliance with the 404(b)(1) Guidelines (40 CFR 230.12):

The discharge complies with the guidelines.

The discharge complies with the guidelines, with the inclusion of the appropriate and practicable conditions listed above (section 6.3.2) to minimize pollution or adverse effects to the affected ecosystem.

The discharge fails to comply with the requirements of these guidelines because:

There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem and that alternative does not have other significant adverse environmental consequences.

The proposed discharge will result in significant degradation of the aquatic ecosystem under 40 CFR 230.10(b) or (c).

The discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem, namely....

There is not sufficient information to make a reasonable judgment as to whether or not the proposed discharge will comply with the guidelines.

d. Finding of No Significant Impact (FONSI) (40 CFR 1508.13): I find that based on the evaluation of environmental effects discussed in this document, the decision on this application is not a major federal action significantly affecting the quality of the human environment. Under the Council on Environmental Quality (“CEQ”) NEPA regulations, “NEPA significance” is a concept dependent upon context and intensity (40 C.F.R. § 1508.27.) When considering a site-specific action like the proposed, significance is measured by the impacts felt at a local scale, as opposed to a regional or nationwide context. The CEQ regulations identify a number of factors to measure the intensity of impact. These factors are discussed below, and none are implicated here to warrant a finding of NEPA significance. A review of these NEPA “intensity” factors reveals that the proposed action would not result in a significant impact—neither beneficial nor detrimental--to the human environment. Hence, an environmental impact statement is not required.

i. Impacts on public health or safety:

- ii. Unique characteristics:
- iii. Controversy:
- iv. Uncertain impacts:
- v. Precedent for future actions:
- vi. Cumulative significance:
- vii. Historic resources:
- viii. Endangered species:
- ix. Potential violation of state or federal law:

e. I have considered all factors relevant to this proposal including cumulative effects. Potential factors included conservation, economics, esthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people. After weighing favorable and unfavorable effects as discussed in this document, I find that this project is not contrary to the public interest and that a Department of the Army permit should be issued.

ENVIRONMENTAL ASSESSMENT AND STATEMENT OF FINDINGS

Section 404(b)(1) Guidelines Compliance Determination 40 CFR 230, Federal Register, 24 December 1980

APPLICANT:

APPLICATION NUMBER:

1. Review of Compliance (230.10(a)-(d))

A review of the permit application indicates:

a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic project purpose unless there are no practicable alternatives to the proposed activity (if no, see Sec. 2 and information gathered for EA alternative); Summary of reasons for YES:	Yes <input type="checkbox"/> No <input type="checkbox"/>
b. The activity does not appear to: 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and 3) violate requirements of any Federally designated marine sanctuary (if no, see Sec. 2b and check response from resource and water quality certifying agencies);	Yes <input type="checkbox"/> No <input type="checkbox"/>
c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values (if no, see Section 2);	Yes <input type="checkbox"/> No <input type="checkbox"/>
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see Sec. 5);	Yes <input type="checkbox"/> No <input type="checkbox"/>

2. Technical Evaluation Factors (Subparts C-F):

a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)		Not Applicable	Not Significant	Significant
1)	Substrate impacts			
2)	Suspended particulate / turbidity impacts			
3)	Water column impacts			
4)	Alteration of current patterns and water circulation			
5)	Alteration of normal water fluctuations /hydroperiod			
6)	Alteration of salinity gradients			

b. Biological Characteristics of the Aquatic Ecosystem (Subpart D)		Not Applicable	Not Significant	Significant
1)	Effect on threatened / endangered species and their habitat			
2)	Effect on the aquatic food web			
3)	Effect on other wildlife (mammals, birds, reptiles and amphibians)			
c. Potential Impacts on Special Aquatic Sites (Subpart E)				
1)	Sanctuaries and refuges			
2)	Wetlands			
3)	Mudflats			
4)	Vegetated Shallows			
5)	Coral reefs			
6)	Riffle and pool complexes			
d. Human Use Characteristics (Subpart F).				
1)	Effects on municipal and private water supplies			
2)	Recreational and commercial fisheries impacts			
3)	Effects on water related recreation			
4)	Aesthetic impacts			
5)	Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.			

3. Evaluation of Dredged or Fill Material (Subpart G):

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material.		Check when appropriate
1)	Physical characteristics	
2)	Hydrography in relation to known or anticipated sources of contaminants	
3)	Results from previous testing of the material or similar material in the vicinity of project	
4)	Known, significant sources of persistent pesticides from land runoff or percolation	
5)	Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances	
6)	Other public records of significant introduction of contaminants from industries, municipalities or other sources	
7)	Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man induced discharge activities	
8)	Other sources (specify)	
List of appropriate references and comments:		

b. An evaluation of the appropriate information in 3a above indicates that there is a reason to believe (1) the proposed dredged or fill material is not a carrier of contaminants, or (2) that levels of contaminants are substantively similar at extraction and disposal sites, or (3) acceptable constraints will be implemented to prevent contaminants from being transported beyond the disposal site. The material meets the testing exclusion criteria.	Yes <input type="checkbox"/> No <input type="checkbox"/>
--	---

4. Disposal Site Delineation (230.11(f))

a. The following factors as appropriate, have been considered in evaluating the disposal site.		Check when appropriate
1)	Depth of water at disposal site	
2)	Current velocity, direction and variability at disposal	
3)	Degree of turbulence	
4)	Water column stratification	
5)	Discharge vessel speed and direction	
6)	Rate of discharge	
7)	Dredged material characteristics (constituents, amount and type of material, settling velocities)	
8)	Number of discharges per unit of time	
9)	Other factors affecting rates and patterns of mixing (specify)	
List of appropriate references and comments.		
b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and / or size of the mixing zone are acceptable.		Yes <input type="checkbox"/> No <input type="checkbox"/>

5. Actions to Minimize Adverse Effects (Subpart H):

All appropriate and practicable steps have been taken, through the application of recommendations of 230.70 - 230.77 to ensure minimal adverse effects of the proposed discharge.	Yes <input type="checkbox"/> No <input type="checkbox"/>
List actions taken and comments.	

6. Factual Determination (230.11):

A review of appropriate information as identified in items 2- 5 above indicates that there is minimal potential for short or long-term environmental effects of the proposed discharge as related to:		
a)	Physical substrate at the disposal site (review sections 2a, 3, 4, and 5)	Yes <input type="checkbox"/> No <input type="checkbox"/>
b)	Water circulation, fluctuation and salinity(review sections 2a,3,4 and 5)	Yes <input type="checkbox"/> No <input type="checkbox"/>
c)	Suspended particulate / turbidity (review sections 2a, 3, 4,and 5)	Yes <input type="checkbox"/> No <input type="checkbox"/> *
	Explain*	
d)	Contaminant availability (review sections 2a, 3, and 4)	Yes <input type="checkbox"/> No <input type="checkbox"/> *
	Explain*	
e)	Aquatic ecosystem structure and function (review sections 2b,2c,3 and 5)	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Explain*	
f)	Disposal site (review sections 2, 4, and 5)	Yes <input type="checkbox"/> No <input type="checkbox"/> *
	Explain*	
g)	Cumulative impact on the aquatic ecosystem	Yes <input type="checkbox"/> No <input type="checkbox"/> *
	Explain*	
h)	Secondary impacts on the aquatic ecosystem	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Explain*	

7. Compliance Determination:

a. The proposed disposal site for the discharge of dredged or fill material complies with the Section 404(b)(1) guidelines		Yes <input type="checkbox"/>
		No <input type="checkbox"/>
b. The proposed disposal site for the discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following special conditions		Yes <input type="checkbox"/>
		No <input type="checkbox"/>
c. The proposed disposal site for the discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):		Check when appropriate
1)	There is a less damaging practicable alternative	
2)	a) The activity violates water quality or effluent standards	
	b) The activity jeopardizes threatened or endangered species or their habitat	
	c) The activity violates marine sanctuary requirements	
3)	The proposed discharge will result in significant degradation of the aquatic ecosystem.	
4)	The proposed discharge does not include practicable and appropriate measures to minimize potential harm to the aquatic ecosystem.	
5)	Insufficient information to make a reasonable judgment	

Footnotes:

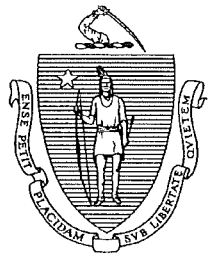
1. A negative, significant, or unknown response indicates that the permit application may not be in compliance with the Section 404(b)(1) guidelines. Summary comments are included.

2. See the Environmental Assessment and Statement of Findings for additional discussions.

Comment #	Author	Comment	Response
E.1	USACE	State jurisdictional terms are well defined throughout the document to describe and quantify impacts. If your intent is for the EA/EIR to be utilized in the review of the Corps Federal permit process, then Federal Jurisdictional boundaries should also be identified in a similar manner and impacts quantified based on these boundaries.	Federal jurisdictional boundaries are defined throughout the Final EA/EIR text and graphics. Table 4.2-2 and Table 4.3-2 in Chapter 4, <i>Environmental Consequences</i> , report the anticipated impacts to aquatic resources within the federal jurisdiction.
E.2	USACE	The high tide line should be added to the plans so it will be clear if the filled sheet pile structure with riprap will require a Section 404 permit and if so, indicate the size of the proposed area to be filled.	The highest high water line has been added to all plans and graphics in the Final EA/EIR. The sheet pile cut-off wall and riprap do not require a Section 404 permit.
E.3	USACE	I also recommend a table be provided that summarizes the area (in square feet or acres) and type of Federal resource areas to be filled that will require a Section 404 permit and another table summarizing the Section 10 dredging as well as all structures with associated dimensions and distance beyond the mean high water line.	Table 4.2-2 and Table 4.3-2 in Chapter 4, <i>Environmental Consequences</i> , report the anticipated impacts to aquatic resources within federal jurisdiction.
E.4	USACE	Another example of the need to clarify Federal jurisdictional areas is on page 3-4 where it is stated that wetlands within the Study Area are protected by Section 404 of the Clean Water Act as waters of the United States and Section 404 jurisdiction includes the area of Coastal Beach, Salt Marsh, and Land Under the Ocean protected by the Massachusetts Wetland Protection Act. However, Table 4.2-1 on page 4-14 indicates that direct wetland impacts for Runway 33L on land containing shell fish as being solely within State jurisdiction. If this area is below the high tide line, then the table should be corrected to include impacts to Federal resource areas.	Land Containing Shellfish is a state-regulated resource area that overlays Coastal Beach and Land Under the Ocean. It is not a separate geographic area. The Final EA/EIR text has been clarified to indicate this.
E.5	USACE	Section 6.2 of the EA discusses Corps permit process as well as the requirements to comply with the EPA Section 404(b)(1) guidelines. I recommend that the EA include the information in the attached Army Corps Section 404 guideline checklist.	The information required in the Army Corps Section 404 guideline checklist is provided throughout the Final EA/EIR, primarily in Chapters 4, 5, and 6. Massport has also submitted a Department of the Army Section 10 and Section 404 Permit Application in January 2011, which includes the required information.
E.6	USACE	Page 5-15 mentions proposed installation of storm water treatment units at outfalls. Area these in Federal jurisdictional areas and what resources, if any, would be impacted?	The installation of stormwater treatment units at outfalls is no longer proposed as part of the proposed project as recommended by the Massachusetts Department of Environmental Protection.
E.7	USACE	The EA provides a preliminary Essential Fish Habitat (EFH) assessment and indicates on page S-14 that "The safety improvements are not anticipated to have permanent impacts to fish habitat at the Runway 33L end. There are no permanent impacts to EFH." The Corps public notice for this project will also require coordination with the National Marine Fisheries Service on the EFH assessment. For projects such as this with impacts to eelgrass, intertidal areas and salt marsh, an expanded EFH assessment would normally be included as a separate document attached to the Corps application and we recommend it also be included as an appendix to the EA.	The National Marine Fisheries Service (NMFS) in their comment letter on the Draft EA/EIR indicated that while Essential Fish Habitat (EFH) assessments are usually a separate document, the required information for a complete and appropriate EFH assessment is provided in the Draft EA/EIR. As a result of their review of the Draft EA/EIR, NMFS provided two EFH Conservation Recommendations (see Comment D.5). Massport accepts the EFH Conservation Recommendations. Massport has committed to no in-water, silt-producing work between February 15th and June 30th for the protection of winter flounder and other marine species. Massport has proposed a comprehensive mitigation program for eelgrass, salt marsh, shellfish, and intertidal mudflat to offset the anticipated impacts to these resources. Development of the mitigation program has occurred in conjunction with the resource agencies, and continued coordination through the permitting process would occur. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.

Comment #	Author	Comment	Response
E.8	USACE	Sections 2.2, 2.3, and Section 5.2 discuss efforts to minimize impacts to resource areas. FAA has determined for the RSA design at runway 33L that width "reductions below 300 feet are unacceptable due to the need for a corridor on either side of the EMAS bed for emergency response and maintenance vehicles to safety maneuver and turn around without risk of driving off and over the water platform." The 300 foot wide deck will have a 65 foot wide corridor. Further details on the type of emergency vehicles expected to utilize the corridor and factors that affect mobility should be provided to further document the need for the proposed corridor width.	FAA has already reduced the minimum RSA width from 500-feet to 300-feet to reflect the unique project area conditions. This reduction has resulted in a real reduction of nearly 94,000 square feet. As outlined in their 33L RSA Determination (see Appendix 3, <i>Alternatives Analysis and FAA Determinations</i> , of the Draft EA/EIR), FAA will not consider any further RSA dimensional reductions.
E.9	USACE	Page 4-118 states that Wetlands and Waterways impacts will not be significant assuming mitigation would be provided consistent with state and federal requirements that would reduce the level of impact to less than significant. In order to support this assumption the EA should have detailed mitigation plans that meet the Corps requirements.	Detailed mitigation plans are provided in the Final EA/EIR and in the Department of the Army Section 10 and Section 404 Permit Application, filed in January 2011. The mitigation plans meet the requirements of the U.S. Army Corps of Engineers.
E.10	USACE	The Corps EA format/checklist required for this type of project has been attached [to the letter]. I recommend that the information required to complete this Corps EA should be included within your NEPA documents and referenced in a manner similar to the ENF Certificate requirements checklist on page S-28, with specific attention being given to the Corps cumulative impacts assessment section.	The information requested by the USACE has been included in the Section 404/Section 10 permit application submitted by Massport.

AC



The COMMONWEALTH OF MASSACHUSETTS
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
251 Causeway Street, Suite 800, Boston, MA 02114-2136
Tel. (617) 626-1200 Fax (617) 626-1240 Web Site: www.mass.gov/czm/buar/index.htm

August 25, 2010

RECEIVED

AUG 25 2010

MEPA

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
Attention: Anne Canaday, MEPA Unit
100 Cambridge St., Suite 900
Boston, MA 02114

RE: Boston-Logan International Airport Runway Safety Area Improvements Project
Draft Environmental Assessment/Environmental Impact Report (EEA# 14442)

Dear Secretary Bowles,

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above referenced draft environmental assessment/draft environmental impact report prepared by Vanasse Hangen Brustlin, Inc. for the Massachusetts Port Authority.

The Board concurs with the findings of "no adverse effect" in the assessment with respect to submerged cultural resources. It notes the proponent will develop an Unanticipated Discovery Plan to deal with heretofore-unknown submerged cultural resources should they be encountered during the course of the project (in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*).

F-1

The Board appreciates the opportunity to provide these comments as part of the review process. Should you have any questions regarding this letter, please do not hesitate to contact me at the address above, by email at victor.mastone@state.ma.us, or by telephone at (617) 626-1141.

Sincerely,

Victor T. Mastone
Director

/vtm

Cc: Brona Simon, MHC
Bob Boeri, MCZM
Richard Doucette, FAA

Comment #	Author	Comment	Response
F.1	Board of Underwater Archaeological Resources	The Board concurs with the findings of "no adverse effect" in the assessment with respect to submerged cultural resources. It notes the proponent will develop an Unanticipated Discovery Plan to deal with heretofore-unknown submerged cultural resources should they be encountered during the course of the project (in accordance with the Board's <i>Policy Guidance for the Discovery of Unanticipated Archaeological Resources</i>).	Massport acknowledges the comment from the Board of Underwater Archaeological Resources. An Unanticipated Discovery Plan will be developed as part of the construction specifications.



THE COMMONWEALTH OF MASSACHUSETTS
 EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
 OFFICE OF COASTAL ZONE MANAGEMENT
 251 Causeway Street, Suite 800, Boston, MA 02114-2136
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RECEIVED

SEP 1 2010

MEMORANDUM

MEPA

TO: Ian A. Bowles, Secretary, EEA
 ATTN: Anne Canaday, MEPA Unit
 FROM: Deerin Babb-Brott, Director, CZM *D. B. B.*
 DATE: September 1, 2010
 RE: EEA 14442 – Logan Airport Runway Safety Improvements; Boston

The Massachusetts Office of Coastal Zone Management (CZM) has completed its review of the above-referenced Draft Environmental Assessment/Environmental Impact Report (DEA/EIR), noticed in the *Environmental Monitor* dated July 21, 2010. Based on our review of the DEA/EIR and our participation in subsequent workgroup meetings, CZM offers the following comments.

Project Description

The DEA/EIR indicates that the proponent considered a number of potential alternatives resulting in the selection of two preferred alternatives. The proponent also stated that due to Logan's location on Boston Harbor, any runway-end safety improvements require work in the intertidal and sub tidal areas. The preferred alternative for runway 22R involves the installation of an inclined safety area at the end of the runway. This alternative would require 8,450 cubic yards of gravel fill to be placed approximately 130 feet north from the existing Engineered Materials Arresting System (EMAS) bed and would be graded over the full 500 foot width of the extended safety area down to the mean low water elevation. The preferred alternative for runway 33L involves the installation of a new EMAS bed and a 300 foot wide pile-supported pier extending approximately 470 feet into Boston Harbor. It also involves the installation of a new localizer deck 300 feet wide by 60 feet long (appended to the proposed deck described above) and two 25 foot wide rip-rap protected emergency access ramps located approximately 30 feet northeast and 70 feet southwest of the proposed deck. Cumulative direct and indirect impacts to coastal wetland resources, totaled for the two preferred alternatives, are as follows; Coastal Bank – 885 linear feet, Coastal Beach – 28,710 square feet (ft²), Salt Marsh – 35,040 ft², Land Under the Ocean – 1,745 ft², Land Containing Shellfish – 69,165 ft², and Eelgrass – 66,600 ft².

Project Comments

In its review, CZM has found the DEA/EIR to be responsive to the scope in the Secretary's Certificate and to CZM's comments on the ENF. Our comments at this point are focused solely on the mitigation program for the unavoidable impacts to eelgrass and salt marsh resources.

The DEA/EIR states that the preferred alternative for runway 33L, which includes the construction of a pile-supported pier in Boston Harbor, would have significant cumulative direct and indirect impacts to eelgrass totaling 66,600 ft². CZM commends the proponent for working with a state/federal eelgrass mitigation working group, whose members include the United States Environmental Protection Agency, National Marine Fisheries Service, Massachusetts Department of



Environmental Protection, Massachusetts Division of Marine Fisheries, and CZM. We strongly encourage the continued collaboration with this group.

Through the eelgrass mitigation working group process, the proponent identified a range of potential mitigation options for evaluation, including in-kind restoration of eelgrass up to a 3:1 ratio of mitigation area to impacted area, and out-of-kind mitigation including contributions to mapping, research, and assessment programs and the replacement of traditional block and chain moorings in eelgrass areas with “conservation” type moorings. The proponent has stated that the development of the final mitigation program will be developed after additional agency and public comments.

An updated eelgrass mitigation strategy (August 16, 2010) was presented to the working group which focused solely on the in-kind alternative. While CZM is generally supportive of the in-kind alternative, because of the poor historical track record for eelgrass transplant and restoration success, we believe that continued discussions and evaluation of out-of-kind alternatives, or a combination of the two, may result in the development of a strategy with the greatest possible benefits to eelgrass habitat both in Boston Harbor and beyond. In the determination of the final mitigation requirements, CZM recommends that construction related impacts, including the anchoring of construction barges and the associated anchor cable sweep, be incorporated into the total areas of resource impact.

G-1

G-2

The preferred alternative for runway 22R involves the direct impact of salt marsh and intertidal area. CZM understands that the Federal Aviation Agency (FAA) Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* may preclude restoration sites located within 10,000 feet of any runway end. In the development of mitigation alternatives for the salt marsh impacts, the Broad Meadows Marsh Habitat Restoration project was identified as a feasible option. The construction on this USACE/City of Quincy project was initiated in the spring of 2010 and will result in the restoration of approximately 50 acres of salt marsh and inter-tidal areas. The permitted project included an add-on component that would restore at least seven additional acres of salt marsh and inter-tidal (twice the required mitigation) and seven acres of upland habitat (not required mitigation). The project would greatly benefit coastal habitat and is located outside the 10,000 foot wildlife hazard management requirements of the FAA. CZM recommends that the proponent continue to work closely with the salt marsh mitigation working group in evaluating the “add-on” component of the Broad Meadows project and the other proposed sites.

G-3

Federal Consistency

The proposed project is subject to CZM federal consistency review, and must be found to be consistent with CZM's enforceable program policies. For further information on this process, please contact, Robert Boeri, Project Review Coordinator, at 617-626- 1050 or visit the CZM web site at www.state.ma.us/czm/fcr.htm.

G-4

DBB/rlb

Ben Lynch, MassDEP Waterways Regulation Program
Tay Evans, Division of Marine Fisheries
Chris Busch, Boston Conservation Commission
Stewart Dalzell, Massport

Comment #	Author	Comment	Response
G.1	Massachusetts Office of Coastal Zone Management	An updated eelgrass mitigation strategy (August 16, 2010) was presented to the working group which focused solely on the in-kind alternative. While CZM is generally supportive of the in-kind alternative, because of the poor historical track record for eelgrass transplant and restoration success, we believe that continued discussions and evaluation of out-of-kind alternatives, or a combination of the two, may result in the development of a strategy with the greatest possible benefits to eelgrass habitat both in Boston Harbor and beyond.	The eelgrass mitigation strategy for in-kind mitigation was proposed to and received consensus from the Eelgrass Working Group. Chapter 5, <i>Proposed Mitigation and Section 6.1 Findings</i> , presents contingencies that Massport is prepared to undertake if initial eelgrass transplanting is unsuccessful.
G.2	Massachusetts Office of Coastal Zone Management	In the determination of the final mitigation requirements, CZM recommends that construction related impacts, including the anchoring of construction barges and the associated anchor cable sweep, be incorporated into the total areas of resource impact.	As discussed in Chapter 4, <i>Environmental Consequences</i> , barge anchor sweep would not occur during construction. Since the construction barges would be secured with spuds, instead of anchored, there is no potential for additional impacts caused by anchor sweep. Barges would be located outside of the eelgrass bed, with the exception of within the footprint of the proposed deck. Temporary impacts related to construction would be assessed post-construction and restored. Please refer to Chapter 5, <i>Proposed Mitigation and Section 6.1 Findings</i> .
G.3	Massachusetts Office of Coastal Zone Management	CZM recommends that the proponent continue to work closely with the salt marsh mitigation working group in evaluating the "add-on" component of the Broad Meadows project and other proposed sites.	Massport evaluated Broad Meadow as a potential salt marsh mitigation site. The costs for completing the Broad Meadows project including disposal exceed the costs for mitigation at the other sites evaluated by Massport. Massport also determined that only providing high marsh, which would reduce the costs, would not accomplish the goals identified for salt marsh and intertidal mitigation. Therefore, Massport, in conjunction with the Salt Marsh Working Group, determined that Broad Meadow would not be retained for further investigation and design.
G.4	Massachusetts Office of Coastal Zone Management	The proposed project is subject to a CZM federal consistency review, and must be found to be consistent with CZM's enforceable program policies.	Chapter 6, <i>Regulatory Compliance</i> , Section 6.4 includes responses to the applicable CZM program policies. A complete application will be submitted to the Office of Coastal Zone Management after the Secretary's Certificate on the Final EA/EIR has been issued, in accordance with 301 CMR 21.00.



COMMONWEALTH OF MASSACHUSETTS
 EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
 Governor

TIMOTHY P. MURRAY
 Lieutenant Governor

IAN A. BOWLES
 Secretary

LAURIE BURT
 Commissioner

RECEIVED

SEP 2 2010

MEPA

September 2, 2010

Secretary Ian A. Bowles
 Executive Office of Energy and Environmental Affairs
 100 Cambridge Street, Suite 900
 Boston, MA 02114

RE: EEA #14442 (previously EEA #5122)
 DEP Wetlands File No. 6-1219
 Boston-Logan International Airport Runway Safety Area Improvements Project

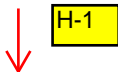
Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Draft Environmental Impact Report (EIR) submitted by the Massachusetts Port Authority (Massport) to evaluate alternative runway safety areas (RSA) for Runways 22R and 33L at Logan International Airport in Boston. At Runway End 22R, Massport is proposing to fill coastal bank (530 LF), salt marsh (35,040 SF), coastal beach (26,630 SF), land containing shellfish (1.4 acres or 62,370 SF), land under ocean (700 SF) and Buffer Zone to create an Inclined Safety Area. At Runway End 33L, Massport is proposed to construct a pile-supported deck over coastal bank (395 LF), coastal beach (4,385 to 4,570 SF), land containing shellfish (460 SF to 1,175 SF), land under the ocean (395 to 1,045 SF) including 1.4 to 1.5 acres (60,100 to 66,600 SF) of eelgrass bed, and Buffer Zone (not quantified) to extend the existing Engineered Materials Arresting System (EMAS). The Wetland regulations, 310 CMR 10.23(3) does not allow salt marsh alteration or allow for any adverse effects on marine fisheries habitat or wildlife habitat caused by destruction of eelgrass beds, 310 CMR 10.25(6)(b). Massport has requested a Variance to the Wetlands Protection regulations to allow the proposed salt marsh and eelgrass alteration. Review of the Variance request has been suspended pending completion of the MEPA process and submission of additional information.

MGL c. 131 - Wetlands

General Comments

In addition to these DEIR comments, MassDEP submitted earlier comments to Massport in June 2010 (see: Appendix 4 - Agency Correspondence) in response the Wetland Variance application request. While more detailed information and plans were included as part of the Variance request, the information required for consideration of a request for a Wetland Protection Act Variance has yet to be developed in sufficient detail for MassDEP to adequately review the variance request. As part of the FEIR, the applicant should develop design-level plans depicting resource area impacts and mitigation in sufficient



detail, as well as detailed construction and operational specifications, sufficient to render a decision on the variance request. The MassDEP will continue its participation in the applicant's on-going interagency mitigation task force related to the development of salt marsh and eelgrass mitigation plans which has been on-going since March 2009.

↑ H-1
cont'd.

In order to most effectively expedite the pending MassDEP variance request, the following issues (if not addressed prior to submittal of the FEIR) should be addressed in the FEIR in order to ensure avoidance, minimization and mitigation of wetland impacts.

- Completion of the alternatives analysis under the NEPA/MEPA review and associated issues raised as part of this process;
- Documentation of communications to and from the FAA relative to RSA modification of standards in order to minimize environmental impacts of the project;
- Demonstration of how the project will comply with the provisions of the Wetlands Protection Act, M.G.L., C. 131, Section 40, and its implementing regulations including but not limited to the variance requirements at 310 CMR 10.05(10) requiring the establishment of overriding public interest; avoidance and minimization measures considered as part of the project design and an explanation for why certain measures were accepted or rejected;

H-2

H-3

H-4

Mitigation

As noted in the DEIR, the Final EA/EIR is scheduled to contain further analysis for proposed mitigation sites and well as refined mitigation goals, based on public and agency feedback. Detailed mitigation design plans and specifications should be addressed in the FEIR for impacts to land under water (310 CMR 10.25), eelgrass beds (310 CMR 10.25(6)(b)), and salt marsh (310 CMR 10.32).

H-5

Land Under Water (LUW)

Based on discussions to date, it remains unclear what is intended for mitigation for impacts to intertidal areas. It appears that mitigation will be provided either through the creation of creeks, pannes, and pools (as incorporated in salt marsh mitigation) or in the form of in-lieu fees for off-site restoration for, as yet, undetermined mitigation projects. While the possibility of in-lieu contributions are being considered to supplement funding of the on-going Broad Meadows project in Quincy, the timing of the Massport RSA proposal may not coincide with the timeline for the completion of the Broad Meadows project. The viability of the in-lieu fees for LUW mitigation is further dependent on the final determination of the USACOE. The USACOE has yet to define the acceptable parameters for in-lieu fee contributions. These considerations would include the role to be required of Massport as well as the need to retain contractors to contribute to the effort which are satisfactory to the USACOE.

H-6

If Broad Meadows is deemed to constitute satisfactory mitigation, further consideration would be required for compensation of intertidal and shellfish impacts. Shellfish mitigation plans should be further refined in the FEIR to specify terms and procedures for the harvest and transplant of shellfish.

H-7

Eelgrass Mitigation

In order to achieve a 3:1 eelgrass mitigation ratio, the FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including:

- collection of field data and the undertaking a site-selection modeling effort (as outlined in the VHB Memo Re: Logan RSA – Eelgrass Mitigation Strategy, dated August 16, 2010);
- updated map of the aerial extent and density of eelgrass habitat in the project area conducted during the growing season prior to construction;
- final estimates of direct eelgrass impacts from the project and indirect impacts from shading, sediment deposition outside of the footprint, changes in sediment distribution from alterations in water circulation, and anticipated impacts from construction barges;

H-8

H-9

H-10

- if vessels are to be anchored in eelgrass beds, a discussion of how “anchor sweep” impacts to eelgrass beds will be avoided or minimized; if impacts cannot be avoided, the effects of the anchor sweep need to be calculated and mitigation provided; H-11
- schedule to minimize and/or eliminate the risk of impacts from construction vessels (e.g. limiting barge use to periods of high tide to avoid grounding of barges on eelgrass habitat and the use buoys to mark construction corridors to contain vessels movements); H-12
- document that proposed eelgrass mitigation plans are consistent with methodologies¹ critical to the success of eelgrass restoration efforts; H-13
- a discussion and assessment of the potential eelgrass sites (including the Deer Island Flats and Governor’s Island Flats) identified by the Batelle study conducted as part of the HubLine project and how the findings of this study may assist Massport in choosing suitable transplant sites; H-14
- a survey of any other sites in the outer harbor not assessed in the Batelle study with appropriate physical and biological site characteristics that optimize eelgrass survival; H-15
- a discussion of how the eelgrass plant stock in the footprint of the construction area will be preserved for used as donor stock (i.e. harvested, transported, and transplanted – including possible transplanting into the less dense portion of the existing bed beyond the impacted area) and a timetable of the sequencing steps to ensure optimal eelgrass survival and transplanting success; H-16
- a commitment to pre-construction and long term post-construction monitoring of any proposed mitigation site; H-17
- documentation from the U.S. Department of Agriculture - Wildlife Services as to whether eelgrass habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and whether a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139; H-18
- a monitoring plan to track the success of all eelgrass transplant efforts and the criteria (e.g. root/shoot density comparable to the existing eelgrass meadow and the targeted percent of re-established cover over a one, three, and five-year timeframe) to be used to measure the success of the restoration effort; H-19
- remedial plans to be undertaken in the event that initial restoration efforts fail. H-20

Salt Marsh Mitigation:

The information contained in the *Salt Marsh Mitigation Site Evaluation Report*, June 2010 should be supplemented as follows. In order to achieve the 2:1 salt marsh replacement ratio, the FEIR should document the protocol for how Massport intends to choose and develop suitable replication sites. The salt marsh replacement plans should include:

- plan views, cross-sections, final planting plans, and a monitoring plan; H-21
- the size and location of the existing and replicated wetland, at a scale in the range of 1"=10' to 1" = 40", and shall include easily identifiable landmarks such as surveyed flag locations, benchmarks, or structures; H-22
- contour lines at 2' intervals for existing areas and 1' intervals for proposed areas; H-23
- sufficient number of spot elevations to describe the topography of the wetland and the surrounding area including grade elevations below the highest spring tides of the year with portions below mean high tide H-24
- the locations of soil test pits and vegetation plots; H-25
- cross-sections of the existing and proposed wetland subsurface, showing soil types, depths, and locations using both horizontal and vertical scales. H-26

¹ Leschen, A. S. et al., 2010, Successful Eelgrass (*Zostera marina*) Restoration in a Formerly Eutrophic Estuary (Boston Harbor) Supports the Use of a Multifaceted Watershed Approach to Mitigating Eelgrass Loss: Estuaries and Coasts.

Short, F.T. et al., 2002, Site selection model for optimal restoration of eelgrass, *Zostera marina* L. Marine Ecology Progress Series 227: 253-267.

- documentation that a minimum replacement area ratio of 2:1 be located in the same general area or water body as the area lost, unless a determination is provided from the U.S. Department of Agriculture - Wildlife Services that salt marsh habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139; H-27
- locations that are not tidally restricted by any pipe, culvert, bridge, roadway or other development and not colonized by invasive species; H-28
- internal sloped drainage creeks and panne areas with suitable depths to provide killifish habitat; H-29
- provisions for assessments of potential contamination if the proposed salt marsh restoration sites containing dredged spoils; H-30

Depending on project specifics, proposed salt marsh restoration mitigation that involves the enlargement, removal, or replacement (with tide gates) of culvert tidal restrictions may be acceptable for meeting some portion of the salt marsh mitigation requirement. H-31

For all mitigation, the expectation remains that the FEIR will include a short list of viable mitigation sites. H-32

Stormwater

The Wetlands and 401 Water Quality Certification regulations, at 310 CMR 10.05(6) and 314 CMR 9.06(6), respectively, require compliance with ten Stormwater Standards to protect wetland interests. Unmanaged or improperly managed stormwater runoff causes detrimental effects to the interests protected in wetland resource areas including erosion, scour, sedimentation, changes to hydrology, changes to wetland plant communities, promotion of invasive plant species (e.g. Phragmites, an invasive plant species is now present at Logan Airport), and damaging effects to aquatic organisms including fin fish and shellfish. The velocity of the discharged stormwater is also of concern, since unchecked velocity may scour coastal beaches and lead to loss of aquatic plants, including the habitat aquatic plants provide to fin and shellfish.

Runway End 33L RSA (deck): to comply with the Stormwater Standards that must be met specified at 310 CMR 10.05(6)(k)(1) – (10) and 314 CMR 9.06(6), Massport proposes to install a StormCeptor device or equivalent at existing Outfall A-30 or A-31 at Runway End 33L to improve the quality of the existing stormwater discharge, prepare a construction period control plan, and form an operation and maintenance plan for post construction operation of the proposed stormwater management measures. For the proposed deck RSA, Massport proposes to collect and discharge stormwater runoff directly to wetland resource areas without any recharge or water quality treatment, contending that it does not need any such treatment. The lack of measures to control or treat the stormwater runoff from the proposed deck will likely impair interests protected by the Wetlands Protection Act, including fin fish and shellfish. The Stormwater Standards are regulatory requirements and are not optional. Measures must be proposed in the FEIR to comply with the ten Stormwater Standards. In addition, Massport needs to be aware that StormCeptor and other reviews conducted by the Massachusetts Strategic EnviroTechnology Partnership (STEP) reviews are to sunset on January 1, 2011. After January 1, 2011, StormCeptors and other proprietary treatment practices reviewed by STEP may only be used for pretreatment and are not allowed for end-of-pipe treatment. The sunseting will also eliminate the presumptive TSS removal credits previously extended by MassDEP to devices reviewed by STEP. As such, other practices will need to be evaluated by Massport to meet Stormwater Standard No. 7. Lastly, an evaluation of Environmentally Sensitive Site Design (ESSD), including Low Impact Development (LID) measures needs to be included, as outlined by MassDEP in its letter to Massport dated June 22, 2010. Redirecting the runoff from the proposed deck to be recharged to groundwater must be evaluated as an alternative, as this alternative will reduce velocity, volume, and scour effects, as well as freshwater impacts to the intertidal and tidal zones. H-33

Runway End 22R RSA (Inclined Safety Area): to comply with the ten Stormwater Standards that must be met specified at 310 CMR 10.05(6)(k)(1) – (10) and 314 CMR 9.06(6), Massport only proposes to improve conditions at Outfall A-12 to reduce scour. As is the case with the stormwater management measures H-34

H-35

H-36

H-37

proposed at Runway End 33L, the measure proposed for Runway end 22L appear to be inadequate to meet the ten Stormwater Standards. Alternative measures must be evaluated to meet the ten required Stormwater Standards, including evaluation of ESSD/LID alternatives.

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H-37
cont'd.

401 Water Quality Certificate

The Water Quality Certification application requires documentation of how the project meets the regulation requirements of 314 CMR 9.00 and the associated criteria for the evaluation of applications for discharge of dredged or fill material to salt marsh and land under water 310 CMR 9.06. Sediment sampling/ testing information and a discussion of dredge material disposal options was not provided in the DEIR (or its associated Appendices) and should be developed as part of the FEIR.

H-38

Specifically, Section 4.3.7.3 (pg. 4-93) indicated that the sediment related to Runway 22R ISA "were sampled and subjected to both physical and chemical analysis in accordance with Massachusetts Water Quality Certification Regulation [314 CMR 9.00] and compared to NOAA's Sediment Quality Guidelines." However, results of the sampling were not included in the DEIR. The proponent should made aware that 314 CMR 9.07(2)(b)8 required the chemical analysis of sediment "shall have been performed within three years of the date of submission of the [401] application" if the data is to be used as part of the pre-characterization. The discussion pertaining to Section 4.3.5.3 Temporary Construction Impacts stated that "any turbidity created would be quickly dispersed by the tides; therefore, the effects from the temporary construction-related turbidity are negligible." The MassDEP does not consider "tide dispersion" as a Best Management Practices (BMPs) and will require a turbidity monitoring program during excavation/dredging of approximately 8,450 cubic yards of unsuitable material. Finally, the Applicant should be aware of the requirement of transporting dredged material on public roadways (314 CMR 9.7(5)) that "no free liquid as determined by the paint filter test". The FEIR should include results of the sediment analysis, reconsideration of turbidity control BMPs, and consideration of on-site dredged material dewatering.

H-39

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MGL Chapter 91- Waterways Licensing

As noted in the ENF comments submitted by MassDEP, both the Runway 22R and Runway 33L portions of the project require approval under the variance provisions of the Waterways Regulations at 310 CMR 9.21, since neither the proposed fill nor structures are categorically allowed for nonwater-dependent use by 310 CMR 9.32.

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H-42

The DEIR is generally responsive to our previous comments. Section 6.6 of the DEIR addresses the project in the context of the c. 91 variance provisions. The document makes a credible argument that the project is eligible to be considered under the variance provisions by showing that there are no alternatives that allow the project to proceed in compliance with 310 CMR 9.00; that the project includes measures to minimize interference with public interests in waterways and has proposed mitigation to compensate for any remaining detriments to the public interest in tidelands; and has made a good argument that the project is necessary to accommodate an overriding regional/state/federal interest.

In addition to the variance analysis, the substantive standards that MassDEP will use to evaluate the project are those related to Nonwater-dependent Infrastructure Facilities found at 310 CMR 9.55. Since public access is restricted at this site due to security concerns, MassDEP's review would concentrate instead on the resource impacts to salt marsh, eelgrass, and loss of shellfish habitat and adequate mitigation of those impacts in accordance with 310 CMR 9.55(1)(b-c). The FEIR should further refine the proposed mitigation plan in anticipation of the filing of the variance license application.

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H-42
cont'd.

In conclusion, MassDEP reserves the right to request additional information as project design, plans, and calculations are developed for the purpose of MEPA/NEPA, applicable the statutes and regulations, and for compliance with the referenced environmental permits, licenses, and certifications.

Sincerely,

[signed]

Lealdon Langley
Director
Wetlands and Waterways Program

Cc: MassDEP NERO Wetlands Program, MEPA Coordinator
MCZM, Robert Boeri, Brad Washburn
Boston Conservation Commission
MDMF, Tay Evans

Comment #	Author	Comment	Response
H.1	Massachusetts Department of Environmental Protection	As part of the FEIR, the applicant should develop design-level plans depicting resource area impacts and mitigation in sufficient detail, as well as detailed construction and operational specifications, sufficient to render a decision on the variance request.	Included in Chapter 5 of the Final EA/EIR are detailed, conceptual design-level plans depicting resource area impacts and mitigation. The same materials were also submitted to the Massachusetts Department of Environmental Protection as part of the Variance request.
H.2	Massachusetts Department of Environmental Protection	In order to most effectively expedite the pending MassDEP variance request, the following issues (if not addressed prior to submittal of the FEIR) should be addressed in the FEIR in order to ensure avoidance, minimization, and mitigation of wetland impacts: Completion of the alternatives analysis under NEPA/MEPA review and associated issues raised as part of this process.	Chapter 2, <i>Alternatives Analysis</i> , of the Draft EA/EIR provided a complete alternatives analysis under the NEPA/MEPA review. The Secretary's Certificate on the Draft EA/EIR requested that Massport investigate opportunities for further minimization of impacts. As stated in Chapter 2, <i>Alternatives Analysis</i> , of the Final EA/EIR further minimization is not practicable in light of the project's purpose and is contrary to the FAA's determinations for Runway 33L end and Runway 22R end.
H.3	Massachusetts Department of Environmental Protection	In order to most effectively expedite the pending MassDEP variance request, the following issues (if not addressed prior to submittal of the FEIR) should be addressed in the FEIR in order to ensure avoidance, minimization, and mitigation of wetland impacts: Documentation of communications to and from FAA relative to RSA modification of standards in order to minimize environmental impacts of the project.	The FAA determinations for Runway 33L and Runway 22R were included in the Draft EA/EIR in Appendix 3, <i>Alternatives Analysis and FAA Determinations</i> . As described in Chapter 2, <i>Alternatives Analysis</i> , of the Final EA/EIR, further minimization is not practicable in light of the project's purpose and is contrary to the FAA's determinations for Runway 33L end and Runway 22R end. Massport will continue to evaluate piling configurations and construction methods as final design proceeds in an effort to identify further minimization opportunities.
H.4	Massachusetts Department of Environmental Protection	In order to most effectively expedite the pending MassDEP variance request, the following issues (if not addressed prior to submittal of the FEIR) should be addressed in the FEIR in order to ensure avoidance, minimization, and mitigation of wetland impacts: Demonstration of how the project will comply with the provisions of the Wetlands Protection Act, M.G.L., C.131, Section 40, and its implementing regulations including but not limited to the variance requirements at 310 CMR 10.01(10) requiring the establishment of an overriding public interest; avoidance and minimization measures considered as part of the project design, and an explanation for why certain measures were accepted or rejected.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes the proposed mitigation program for the anticipated impacts of the Logan Airport RSA Improvements Project. Section 5.2 documents the avoidance and minimization measures taken by Massport. Further minimization is not practicable in light of the project purpose and is contrary to the FAA's determinations on the Runway 33L end and Runway 22R end. Chapter 6, <i>Regulatory Compliance</i> , establishes how the project complies with the provisions of the Wetlands Protection Act requirements for a Variance. The same materials have been submitted to the Massachusetts Department of Environmental Protection as part of the Variance request.
H.5	Massachusetts Department of Environmental Protection	Detailed mitigation design plans and specifications should be addressed in the FEIR for impacts to land under water (310 CMR 10.25), eelgrass beds (310 CMR 10.25(6)(b)), and salt marsh (310 CMR 10.32).	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes the proposed mitigation program for the anticipated impacts of the Logan Airport RSA Improvements Project. Included in Chapter 5 are detailed mitigation design plans and specifications. The same materials have been submitted to the Massachusetts Department of Environmental Protection as part of the Variance request.
H.6	Massachusetts Department of Environmental Protection	Based on discussions to date, it remains unclear what is intended for mitigation for impacts to intertidal areas. It appears that mitigation will be provided either through the creation of creeks, panes, and pools (as incorporated in salt marsh mitigation) or in the form of in-lieu fees for off-site restoration for, as yet, undetermined mitigation projects. While the possibility of in-lieu contributions are being considered to supplement funding of the on-going Broad Meadows project in Quincy, the timing of the Massport RSA proposal may not coincide with the timeline for the completion of the Broad Meadow project. The viability of the in-lieu fees for LUW mitigation is further dependent on the final determination of the USACOE. The USACOE has yet to define the acceptable parameters for in-lieu fee contributions. These considerations would include the role to be required of Massport as well as the need to retain contractors to contribute to the effort which are satisfactory to the USACOE.	As discussed in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , Massport does not propose in-lieu funding as mitigation for impacts to eelgrass or salt marsh, and is no longer considering salt marsh restoration at Broad Meadow in Quincy. The salt marsh mitigation plan described in this chapter includes measures to restore intertidal mud flats as well as salt marsh.
H.7	Massachusetts Department of Environmental Protection	If Broad Meadows is deemed to constitute satisfactory mitigation, further consideration would be required for compensation of intertidal and shellfish impacts. Shellfish mitigation plans should be further refined in the FEIR to specify terms and procedures for the harvest and transplant of shellfish.	As described in the response to Comment G.3 above, Massport evaluated Broad Meadow as a potential site for salt marsh mitigation, but determined that it could not provide adequate mitigation at a reasonable cost. Shellfish mitigation plans, including the terms and procedures for the harvest and transplant of shellfish, are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .

Comment #	Author	Comment	Response
H.8	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: a collection of field data and the undertaking a site-selection modeling effort (as outlined in the VHB Memo RE: Logan RSA - Eelgrass Mitigation Strategy, dated August 16, 2010.)	A site selection model was used to determine potential sites for eelgrass mitigation in Boston Harbor. During the fall of 2010, field data was collected at the sites identified by the model. Both the proposed plan and the results of the site selection model and field data collection were presented in the Eelgrass Working Group at the Joint Working Group Meeting held on December 17, 2010. The results are also described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
H.9	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: an updated map of the aerial extent and density of eelgrass habitat in the project area conducted during the growing season prior to construction.	Massport completed mapping of the extent and density of the existing eelgrass bed. Massport intends to harvest eelgrass from within the proposed deck footprint prior to the start of construction for use at the mitigation sites. A post-construction monitoring program is proposed at the transplant sites and at the Runway 33L bed as documented in Chapter 5.
H.10	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: final estimates of direct eelgrass impacts from the project and indirect impacts from shading, sediment deposition outside of the footprint, changes in sediment distribution from alterations in water circulation, and anticipated impacts from construction barges.	The direct and indirect impacts to eelgrass from the project are described in Chapter 4, <i>Environmental Consequences</i> . Section 4.2.1.1 provides the details on direct impacts to eelgrass. The indirect impacts from shading, sediment deposition, and sediment distribution are described in Sections 4.2.1.2 and 4.2.1.3. Construction barges would be located within the footprint of the deck, an area that would be lost as a result of the project, or located outside of the eelgrass bed. Mitigation is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
H.11	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: if vessels are to be anchored in eelgrass beds, a discussion of how "anchor sweep" impacts to eelgrass beds will be avoided or minimized; if impacts cannot be avoided, the effects of the anchor sweep need to be calculated and mitigation provided.	Barge anchor sweep would not occur during construction. Since the construction barges would be secured with spuds, instead of anchored, there is no potential for additional impacts caused by anchor sweep. Refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.1.3, and Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
H.12	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: the schedule to minimize and/or eliminate the risk of impacts from construction vessels (e.g. limiting barge use to periods of high tide to avoid grounding of barges on eelgrass habitat and the use of buoys to mark construction corridors to contain vessel movements).	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes the efforts to minimize and/or eliminate the risk of impacts from construction vessels on eelgrass.
H.13	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: document that proposed eelgrass mitigation plans are consistent with methodologies critical to the success of eelgrass restoration efforts.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes how the proposed eelgrass mitigation plans are consistent with the methodologies critical to the success of eelgrass restoration efforts.
H.14	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: a discussion and assessment of the potential eelgrass sites (including the Deer Island Flats and Governor's Island Flats) identified by the Batelle study conducted as part of the Hubline project and how the findings of this study may assist Massport in choosing suitable transplant sites.	The Batelle Study methodologies for site selection and sites identified by the Batelle Study were included in the site selection process. The site selection process re-evaluated sites selected by the Batelle Study and a Massachusetts Division of Marine Fisheries study (Estrella 2009) by accounting for changes in light availability since the two studies were completed. The details of the site selection process are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
H.15	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: a survey of any other sites in the outer harbor not assessed in the Batelle study with an appropriate physical and biological site characteristics that optimize eelgrass survival.	Inner and outer Boston Harbor sites identified in the Batelle Study and a Massachusetts Division of Marine Fisheries study (Estrella 2009) were included in the survey.

Comment #	Author	Comment	Response
H.16	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: a discussion of how the eelgrass plant stock in the footprint of the construction area will be preserved for use as a donor stock (i.e. harvested, transported, and transplanted - including possible transplanting into the less dense portion of the existing bed beyond the impacted area) and a timetable of the sequencing steps to ensure optimal eelgrass survival and transplanting success.	The eelgrass plant stock in the footprint of the construction area would be harvested by Massport prior to the start of construction and transplanted at a primary and backup site. The timetable and sequencing steps are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
H.17	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: a commitment to pre-construction and long term post-construction monitoring of any proposed mitigation site.	Massport has committed to a monitoring program as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Post-construction monitoring will occur over 5 years at the primary and backup sites. A reference site will be established for comparison purposes.
H.18	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: documentation from the U.S. Department of Agriculture - Wildlife Services as to whether eelgrass habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular : 150/5200-338 and whether a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139.	USDA has observed brant feeding in the eelgrass beds in the project area. As described in their letter addressing salt marsh mitigation siting, brant constitute a wildlife hazard. Understanding that there are very limited sites for eelgrass mitigation, USDA has noted that mitigation of eelgrass at deeper depths are less likely to attract hazardous wildlife.
H.19	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: a monitoring plan to track the success of all eelgrass transplant efforts and the criteria (e.g. root/shoot density comparable to the existing eelgrass meadow and the targeted percent of reestablished cover over a one, three, and five-year timeframe) to be used to measure the success of the restoration effort.	Massport has committed to a monitoring program as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Post-construction monitoring will occur over 5 years at the primary and backup sites. A reference site will be established for comparison purposes.
H.20	Massachusetts Department of Environmental Protection	The FEIR should include a detailed protocol of how the Applicant intends to choose suitable transplant sites, including: remedial plans to be undertaken in the event that initial restoration efforts fail.	In the event the initial restoration effort is not successful, the following contingency plan will be implemented. The restoration bed will be investigated to determine what factors contributed to the failure of the effort. Monitoring of the restoration bed will provide indications and an early warning that the restoration effort will not be successful. Implementation of the contingency plan will not wait the full 5 years of monitoring before corrective measures are undertaken. The site selection process has identified White Head Flats and Old Harbor as suitable for restoration and has identified up to 16.9 acres of potential habitat. Approximately 4.6 acres of restoration bed is needed to meet the required 3:1 restoration ratio. The proposed restoration plan will likely include planting half of the needed restoration area at the two most promising sites to increase the potential for success. Contingency measures will look at relocating the restoration bed within the same general location (White Head Flats), or relocating the restoration effort to an entirely new location. If one restoration sites fail and the other is successful, expanding the planting at the successful site would have to be considered. If it is determined the method of transplantation was the cause of the failure, other methods will be used for the replacement restoration effort. For further information, refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .

Comment #	Author	Comment	Response
H.21	Massachusetts Department of Environmental Protection	The information contained in the <i>Salt Marsh Mitigation Site Evaluation Report</i> , June 2010, should be supplemented as follows. In order to achieve the 2:1 salt marsh replacement ratio, the FEIR should document the protocol for how Massport intends to choose and develop suitable replication sites. The salt marsh replacement plans should include plan views, cross-sections, final planting plans, and a monitoring plan.	Salt marsh mitigation plans include plan views, cross sections, final planting plans, and a monitoring plan. These are included in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
H.22	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include the size and location of the existing and replicated wetland, at a scale in the range of 1"=10' to 1"=40', and shall include easily identifiable landmarks such as surveyed flag locations, benchmarks, or structures.	Salt marsh mitigation plans include the size and location of the existing and replicated wetland, at a readable scale, and identifies landmarks.
H.23	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include contour lines at 2' intervals for existing areas and 1' intervals for proposed areas.	Salt marsh mitigation plans include contour lines at 2-foot intervals for the existing areas and 1-foot intervals for the proposed areas.
H.24	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include sufficient number of spot elevations to describe the topography of the wetland and the surrounding area including grade elevations below the highest spring tides of the year with portions below mean high tide.	Salt marsh mitigation plans include spot elevations of the wetland and the surrounding area, including grade elevations below the highest spring tides of the year with portions below the mean high tide.
H.25	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include the locations of soil test pits and vegetation plots.	Soil test pits and vegetation plots were not developed in the I-95 fill area, as these characteristics have been previously documented and are not required for the salt marsh restoration design.
H.26	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include cross-sections of the existing and proposed wetland subsurfaces, showing soil types, depths, and locations using both horizontal and vertical scales.	The salt marsh replacement plans include cross sections of the existing and proposed wetland subsurfaces, and show soil types, depths, and locations using both horizontal and vertical scales.

Comment #	Author	Comment	Response
H.27	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include documentation that a minimum replacement area ratio of 2:1 be located in the same general area or water body as the area lost, unless a determination is provided from the U.S. Department of Agriculture - Wildlife Services that salt marsh habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory circular: 150/200-33B and a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139.	The USDA has determined that the salt marsh areas adjacent to the runways and taxiways at Logan Airport serve as an attractant for wildlife species causing hazards to aircraft operations. The USDA recommends that only off-site salt marsh mitigation opportunities be carried forward for further consideration. The USDA's letter, dated December 16, 2010, is included in Appendix 4, <i>Agency Correspondence</i> .
H.28	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include locations that are not tidally restricted by any pipe, culvert, bridge, roadway or other development and not colonized by invasive species.	The proposed salt marsh does not include areas that are tidally restricted by any pipe, culvert, bridge, roadway or other development. There are some areas at the salt marsh mitigation site in Rummey Marsh that have invasive species. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , provide the protocol Massport intends to use to control the spread and colonization of invasive species into the proposed salt marsh mitigation areas.
H.29	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include internal sloped drainage creeks and panne areas with suitable depths to provide killifish habitat.	The salt marsh replacement plans include creeks and pannes that could provide killifish habitat.
H.30	Massachusetts Department of Environmental Protection	The salt marsh replacement plans should include provisions for assessments of potential contamination if the proposed salt marsh restoration sites containing dredged spoils.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , describes the provisions for assessments of potential contamination. However, the soil at the proposed salt marsh mitigation site in Rummey Marsh has been tested for numerous previous projects and has been found to be clean.
H.31	Massachusetts Department of Environmental Protection	Depending on project specifics, proposed salt marsh restoration mitigation that involves the enlargement, removal, or replacement (with tide gates) of culvert tidal restrictions may be acceptable for meeting some portion of the salt marsh mitigation requirement.	Salt marsh mitigation will be entirely replacement salt marsh at Rummey Marsh. The enlargement, removal, or placement of culvert tidal restrictions are not proposed.
H.32	Massachusetts Department of Environmental Protection	For all mitigation, the expectation remains that the FEIR will include a short list of viable mitigation sites.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , identifies all of the potential salt marsh mitigation sites that have been assessed by Massport since the start of this project. As described in Section 5.2, at the December 17, 2010 Salt Marsh Working Group meeting, consensus was reached among the resource agencies and Massport that EPA Sites 4 and 5, in Rummey Marsh, would be the preferred salt marsh mitigation site.

Comment #	Author	Comment	Response
H.33	Massachusetts Department of Environmental Protection	For the proposed deck RSA, Massport proposes to collect and discharge stormwater runoff directly to wetland resource areas without any recharge or water quality treatment, contending that it does not need any such treatment. The lack of measures to control or treat the stormwater runoff from the proposed deck will likely impair interests protected by the Wetlands Protection Act, including fin fish and shellfish. The Stormwater Standards are regulatory requirements and are not optional. Measures much be proposed in the FEIR to comply with the ten Stormwater Standards.	Massport has evaluated other options raised by DEP for stormwater management and determined that it is not feasible to pipe the runoff from the deck back onto the land and treat the stormwater on land, and not necessary because the stormwater is considered clean and does not change the runoff rates. Chapter 6, <i>Regulatory Compliance</i> , documents how the proposed project meets the 10 stormwater standards.
H.34	Massachusetts Department of Environmental Protection	In addition, Massport needs to be aware that StormCeptor and other reviews conducted by the Massachusetts Strategic EnviroTechnology Partnership (STEP) reviews are to sunset on January 1, 2011. After January 1, 2011, StormCeptors and other proprietary treatment practices reviewed by STEP may only be used for pretreatment and are not allowed for end-of-pipe treatment. The sunsetting will also eliminate the presumptive TSS removal credits previously extended by MassDEP to devices reviewed by STEP. As such, other practices will need to be evaluated by Massport to meet Stormwater Standard No. 7.	As a result of comments received from the DEP regarding the use of a StormCeptor unit at the Runway 33L end, Massport re-evaluated stormwater management at the Runway 33L end. Please refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.5.1 of the Final EA/EIR. Chapter 6, <i>Regulatory Compliance</i> , documents how the proposed project addresses the 10 stormwater standards.
H.35	Massachusetts Department of Environmental Protection	Lastly, an evaluation of Environmentally Sensitive Site Design (ESSD), including Low Impact Development (LID) measures needs to be included as outlined by MassDEP in its letter to Massport dated June 22, 2010.	An evaluation of Environmentally Sensitive Site Design and Low Impact Development measures are provided in the Final EA/EIR in Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5 and 4.3.5 for Runway 33L and Runway 22R, respectively.
H.36	Massachusetts Department of Environmental Protection	Redirecting the runoff from the proposed deck to be recharged to groundwater must be evaluated as an alternative, as this alternatives will reduce velocity, volume, and scour effects, as well as freshwater impacts to the intertidal and tidal zones.	Infiltration to groundwater is not a significant interest at Logan Airport, as groundwater elevations across the airfield are tidally controlled, the airport is constructed on reclaimed land, and the resulting soils are unsuitable for recharge. Logan does not contribute to groundwater supplies, nor is it significant to maintaining base flows to streams or waterbodies. Therefore, the proposed stormwater management system does not include infiltration BMPs because infiltration is not occurring under existing conditions and is not feasible at this location because of inadequate separation from seasonal high groundwater and poor-quality fill materials. Please refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.5.1 of the Final EA/EIR.
H.37	Massachusetts Department of Environmental Protection	Runway End 22R RSA (inclined safety area): to comply with the ten Stormwater Standards that must be met specified at 310 CMR 10.05 (6)(k)(1)-(10) and 314 CMR 9.06(6), Massport only proposes to improve conditions at Outfall A-12 to reduce scour. As is the case with the stormwater management measures proposed at Runway End 33L, the measure proposed for Runway end 22R appear to be inadequate to meet the ten Stormwater Standards. Alternative measures must be evaluated to meet the ten required Stormwater Standards, including evaluation of ESSD/LID alternatives.	The proposed Runway 22R ISA is in compliance with the Massachusetts Stormwater Standards as documented in Chapter 6, <i>Regulatory Compliance</i> . An evaluation of Environmentally Sensitive Site Design and Low Impact Development measures are provided in the Final EA/EIR in Chapter 4, <i>Environmental Consequences</i> , Section 4.3.5.
H.38	Massachusetts Department of Environmental Protection	The Water Quality Certification application requires documentation of how the project meets the regulations requirements of 314 CMR 9.00 and the associated criteria for the evaluation of applications for discharge of dredged or fill material to salt marsh and land under water (310 CMR 9.06). Sediment sampling/testing information and a discussion of dredge material disposal options was not provided in the DEIR (or its associated Appendices) and should be developed as part of the FEIR.	The results of the sediment sampling are included in the Final EA/EIR. Please refer to Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5.3 and 4.3.5.3 for Runway 33L and Runway 22R, respectively.

Comment #	Author	Comment	Response
H.39	Massachusetts Department of Environmental Protection	Specifically, Section 4.3.7.3 (pg. 4-93) indicated that the sediment related to Runway 22R ISA "were sampled and subjected to both physical and chemical analysis in accordance with Massachusetts Water Quality Certification Regulation (314 CMR 9.00) and compared to NOAA's Sediment Quality Guidelines." However, results of the sampling were not included in the DEIR. The proponent should make aware that 314 CMR 9.07(2)(b)8 required the chemical analysis of sediment "shall have been performed within three years of the date of submission of the [401] application" if the data is to be used as part of the pre-characterization.	The results of the sediment sampling are included in the Final EA/EIR. Please refer to Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5.3 and 4.3.5.3 for Runway 33L and Runway 22R, respectively.
H.40	Massachusetts Department of Environmental Protection	The discussion pertaining to Section 4.3.5.3 Temporary Construction Impacts stated that "any turbidity created would be quickly dispersed by the tides; therefore, the effects from the temporary construction-related turbidity are negligible." The MassDEP does not consider "tide dispersion" as a Best Management Practices (BMPs) and will require a turbidity monitoring program during excavation/dredging of approximately 8,450 cubic yards of unsuitable material.	Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , includes measures to monitor and control construction-period sediment dispersal for the Runway 22R ISA.
H.41	Massachusetts Department of Environmental Protection	Finally, the Applicant should be aware of the requirement of transporting dredged material on public roadways (314 CMR 9.7(5)) that "no free liquid as determined by the paint filter test." The FEIR should include results of the sediment analysis, reconsideration of turbidity control BMPs, and consideration of on-site dredged material dewatering.	The FEIR includes (see Chapter 4, <i>Environmental Consequences</i>) the results of the sediment analysis. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , includes measures to monitor and control turbidity during construction. Prior to construction, Massport will evaluate whether the dredged material will be retained on site.
H.42	Massachusetts Department of Environmental Protection	As noted in the ENF comments submitted by MassDEP, both the Runway 22R and Runway 33L portions of the project requires approval under the variance provisions of the Waterways Regulations at 310 CMR 9.21, since neither the proposed fill nor structures are categorically allowed for nonwater-dependent use by 310 CMR 9.32. In addition to the variance analysis, the substantive standards that MassDEP will use to evaluate the project are those related to nonwater-dependent infrastructure facilities found at 310 CMR 9.55. Since public access is restricted at this site due to security concerns, MassDEP's review would concentrate instead on the resource impacts to salt marsh, eelgrass, and loss of shellfish habitat and adequate mitigation of those impacts in accordance with 310 CMR 9.55(1)(b-c). The FEIR should further refine the proposed mitigation plan in anticipation of the filing of the variance license application.	Chapter 6, <i>Regulatory Compliance</i> , provides a statement of compliance with the applicable provisions of the Waterways Regulations.D105 The proposed mitigation program is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Massport provided the same information to Massachusetts Department of Environmental Protection in the Chapter 91 License application.



Paul J. Diodati
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September 3, 2010

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn: Anne Canaday EEA #14441 [#] 14442
Re: Logan International Airport Runway Safety Area Improvements Project, Boston, MA

Dear Mr. Bowles,

The Massachusetts Division of Marine Fisheries (*Marine Fisheries*) has reviewed the Draft Environmental Impact Report submitted by the Massachusetts Port Authority (*MassPort*) for the Boston-Logan International Airport Runway Safety Area Improvements Project. Below we provide comments on the project's potential impacts to marine fisheries resources and habitats. These comments are part of an ongoing environmental review process and build on our previous comments to MEPA on the Environmental Notification Form.

The proposed Runway Safety Area enhancements include the construction of a pile supported structure to extend over intertidal and subtidal waters of Boston Harbor and a graded gravel fill incline extending from the runway to Mean Low Water over intertidal and subtidal waters. *Marine Fisheries* recognizes that the applicant has attempted to minimize potential impacts with the use of a pile supported deck rather than the originally proposed solid fill structure. However, the project will still result in significant impacts to marine fisheries habitats. Table 4.4-1 of the DEIR, states that the project will result in 69,165 square feet of impacts to land containing shellfish and 66,600 square feet of impacts to eelgrass. This is a large area of impact that warrants further minimization, the use of carefully chosen best management practices, as well as adequate mitigation.

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Logan Airport is located at the heart of Boston Harbor in an ecologically significant area supporting important habitat for marine fisheries species including intertidal mudflats, saltmarshes and subtidal seagrass beds.

Shellfish

The mudflats on the project site support commercially harvested shellfish beds including soft-shell clams (*Mya arenaria*) and blue mussels (*Mytilus edulis*). The project site is part of a historically important area for Boston Harbor shellfishermen. The importance of this area is underestimated in the DEIR as it is largely based on a single, recent survey without consideration of harvest pressure or the historical record. This is particularly misleading as this site exhibits a shellfish recruitment cycle that may span several years. The area's average production, calculated with several years of data, is over 5,130 bushels of soft shell clams per year. In addition, the site

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is favored by shellfishermen because of its wide intertidal flat, enabling access to harvestable area on smaller tides.

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The draft EIR states that the proposed pier will minimize impacts by providing surface area for blue mussel colonization (page 5-38). Blue mussels may establish on the pilings, but another likely scenario is fast colonization of the new surface area by invasive tunicates. Either way the structure of the pilings will represent a habitat conversion that will directly remove habitat for infaunal invertebrates such as soft shell clams.

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The impact of shade from the large pier on the underlying shellfish may be significant due to potential changes in fish foraging behavior, shellfish food availability and potential increase in fouling invasive tunicates under the structure. This impact has not been adequately assessed. Therefore we recommend that the applicant survey other large piers in the area to better understand the condition of underlying shellfish and benthic habitats. The recommended assessments should include shellfish surveys (soft shell clams and blue mussels) with the appropriate number of samples, as well as surveys of the fouling community. In addition, DMF recommends monitoring invasive species and colonization by mussels, after project construction.

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We have the following additional comments on shellfish impacts:

- In some cases in the document it is not clear if direct or indirect impacts to shellfish have been reported. For example, on page 4-13 direct impacts on land containing shellfish at 33L are reported to be from 4,780 -- 5,495 square feet, however Table 4.4-1 indicates that direct and indirect impacts combined are only 1,175 square feet at 33L. This should be made clear in the DEIR.
- We recommend working on outgoing tides to minimize turbidity impacts to adjacent shellfish beds. If this is not feasible and depending on the final design option, sequencing and number of piles used, a time of year restriction to protect soft shell clam spawning may be appropriate.
- Will licensed and permitted commercial shellfishermen have access to shellfish areas under the 33L RSA pier?
- The BOEA Secretary's Certificate (August 2009) states that the DEIR should be distributed to the shellfishing industry and local shellfishing representatives. This was not clearly indicated in the DEIR distribution list. We recommend coordination with *Marine Fisheries* in compiling an appropriate FEIR distribution list to include the shellfishing community.
- Appropriate shellfish mitigation sites are dependant on several factors. There may be areas within Boston Harbor that could support shellfish restoration. However, any shellfish seeding needs to be accomplished in areas not classified as Prohibited and containing the appropriate habitat conditions.

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Eelgrass

Eelgrass (*Zostera marina*) beds are important habitat for many marine fisheries species. The total project impact to eelgrass is approximately 66,600 square feet of direct and indirect impacts beneath the pile supported structure. This is a relatively large area of impact in one of the few remaining natural eelgrass beds in Boston Harbor. The effects of eelgrass loss in Boston Harbor

may include degradation of water quality, increases in coastal erosion and changes in benthic infaunal community structure triggering changes in the abundance, biomass and species richness of associated forage fish (Hughes et al. 2002). The loss of eelgrass resulting from the project may hinder ongoing efforts to improve water quality and restore habitats in Boston Harbor. Further avoidance, minimization and mitigation of eelgrass impacts are warranted. Mitigation plans discussed at the interagency meetings and presented in the DEIR document are preliminary and conceptual. A detailed site selection analysis, including light data and results of test-plot plantings should be included in the FEIR. Ongoing coordination with *Marine Fisheries* and other resource agencies is expected.

I-11

Noise impacts

The noise and vibrations generated through piling installation may result in lethal and sublethal damage to fish species, particularly Alosid fish (i.e. river herring). As described in the DEIR Appendix 7, the impact is dependent on the type of equipment used. The analysis presented in the DEIR indicates that there will be noise levels produced by project work that could exceed the injury thresholds and alter fish behavior. Adherence to the no in-water work time-of-year restriction from February 15th to June 30th will minimize impacts to river herring, in addition to winter flounder, during the early spring as they aggregate and prepare for upstream migration. The use of cushion blocks and non-impact pile driving methods, as suggested in the DEIR, will also likely minimize noise impacts. We would like to see a commitment to using these best management practices in the FEIR,

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Thank you for considering our comments. Please contact Tay Evans at our Gloucester office at (978)-282-0308 x. 168, should you have any questions about this review.

Sincerely,



Paul J. Diodati
Director

cc.

R. Lehan (DFG)
G. Casey, T. Evans, K. Ford (DMF)
B. Boeri (CZM)
K. Chin (DEP)
C. Bush (Boston Conservation Commission)

References

Hughes JE, Deegan LA, Wyda JC, Weaver MJ, Wright A (2002) The effects of eelgrass habitat loss on estuarine fish communities of southern New England. *Estuaries* 25:235-249

Comment #	Author	Comment	Response
I.1	Division of Marine Fisheries	Table 4.4-1 of the DEIR, states that the project will result in 69,165 square feet of land containing shellfish and 66,600 square feet of impacts to eelgrass. This is a larger area of impact that warrants further minimization, the use of carefully chosen best management practices, as well as adequate mitigation.	Further minimization of the proposed RSA improvements is not practicable in light of the project purpose and is contrary to the FAA determinations for Runway 33L and Runway 22R. The proposed mitigation program is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
I.2	Division of Marine Fisheries	The mudflats on the project site support commercially harvested shellfish beds including soft-shell clams (<i>Mya arenaria</i>) and blue mussels (<i>Mytilus edulis</i>). The project site is part of a historically important area for Boston Harbor shellfishermen. The importance of this area is underestimated in the DEIR, as it is largely based on a single, recent survey without consideration of harvest pressure of the historical record. This is particularly misleading as this site exhibits a shellfish recruitment cycle that may span for several years. The area's average production, calculated with several years of data, is over 5,130 bushels of soft-shell clams per year. In addition, the site is favored by shellfishermen because of its wide intertidal flat, enabling access to harvestable area on smaller tides.	Massport acknowledges the additional information provided by the Massachusetts Division of Marine Fisheries (DMF), and has incorporated it into Chapter 3, <i>Affected Environment</i> . Please note that the "area's average production" refers to the entire shellfish resource at Logan Airport and Wood Island. It does not refer to the impact area only. Massport has proposed a mitigation program described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , that has been developed in conjunction with the regulatory agencies, including DMF. Further, local shellfishermen had an opportunity to provide input on the mitigation strategy at a briefing held on December 14, 2010. It is anticipated that the shellfishers will also comment on the mitigation plan presented herein. Massport expects to hold an additional meeting with the shellfishers and DMF during the Final EA/EIR comment period.
I.3	Division of Marine Fisheries	The draft EIR states that the proposed pier will minimize impacts by providing surface area for blue mussel colonization (page 5-38). Blue mussels may establish on the pilings, but another likely scenario is fast colonization of the new surface area by invasive tunicates. Either way the structure of the pilings will represent a habitat conversion that will directly remove habitat for infaunal invertebrates such as soft-shell clams.	Massport has proposed a mitigation program described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , that has been developed in conjunction with the regulatory agencies, including DMF.
I.4	Division of Marine Fisheries	The impact of shade from the large pier on the underlying shellfish may be significant due to potential changes in fish foraging behavior, shellfish food availability and potential increase in fouling invasive tunicates under the structure. This impact has not been adequately assessed. Therefore we recommend that the applicant survey other large piers in the area to better understand the condition of underlying shellfish and benthic habitats. The recommended assessments should include shellfish surveys (soft-shell clams and blue mussels) with the appropriate number of samples, as well as surveys of the fouling community.	As described in Chapter 4, <i>Environmental Consequences</i> , Section 4.2.1.2, the proposed deck would not cause indirect impacts to Land Containing Shellfish. To evaluate if shading affects blue mussel beds, surveys were completed of several shaded sites. The shading caused by the proposed pier is therefore anticipated to have a beneficial effect to blue mussels, and the productivity of Land Containing Shellfish, at the Runway 33L end.
I.5	Division of Marine Fisheries	In addition, DMF recommends monitoring invasive species and colonization by mussels, after project construction.	There is no evidence in Boston Harbor of invasive tunicates (<i>Didemnum vexillum</i>) currently colonizing hard surfaces or adjacent shellfish beds, indicating that this indirect adverse effect is not predictable at this time. Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , outlines a post-construction monitoring program to evaluate the use of pilings and other hard surfaces by shellfish and invasive species.
I.6	Division of Marine Fisheries	In some cases in the document it is not clear if direct or indirect impacts to shellfish have been reported. For example, on page 4-13 direct impacts on land containing shellfish at 33L are reported to be from 4,780-5,495 square feet, however Table 4.4-1 indicates that direct and indirect impacts combined are only 1,175 square feet at 33L. This should be made clear in the FEIR.	The figure reported in Table 4.4-1 of the Draft EA/EIR did not account for all of the elements that would impact Land Containing Shellfish. It only accounted for the direct loss of habitat from the installation of piles/caissons for the Construction Option with the greatest impact. The Final EA/EIR, in Chapter 4, <i>Environmental Consequences</i> , correctly reports the impacts to land containing shellfish.
I.7	Division of Marine Fisheries	We recommend working on outgoing tides to minimize turbidity impacts to adjacent shellfish beds. If this is not feasible and depending on the final design option, sequencing and number of piles used, a time of year restriction to protect soft-shell clam spawning may be appropriate.	Massport acknowledges the comment from the Division of Marine Fisheries (DMF). A time of year restriction from February 15th to June 30th has been agreed to by Massport. Massport will review the final construction methods and sequence with DMF.

Comment #	Author	Comment	Response
I.8	Division of Marine Fisheries	Will licensed and permitted commercial shellfishermen have access to shellfish areas under the 33L RSA pier?	Massport expects that badged shellfishers will continue to have access to this area after construction is completed.
I.9	Division of Marine Fisheries	The EOEA Secretary's Certificate (August 2009) states that the DEIR should be distributed to the shellfishing industry and local shellfishing representatives. This was not clearly indicated in the DEIR distribution list. We recommend coordination with <i>Marine Fisheries</i> in compiling an appropriate FEIR distribution list to include the shellfishing community.	The Draft EA/EIR was distributed to Mr. Bob Stanley of Stanley Seafood, a local processor and distributor of seafood. Mr. Stanley is the Master Digger in the Boston Harbor area, with a number of subordinates. Massport and the Massachusetts Division of Marine Fisheries held a briefing in December 2010 for local shellfishermen, where the shellfishers were able to provide input on the mitigation strategy proposed by Massport. Please refer to Chapter 7, <i>Public and Agency Coordination</i> , for more information on the meeting. As shown in Chapter 8, <i>Distribution List</i> , Massport provided a copy of the Final EA/EIR to Mr. Stanley and has informed the meeting attendees of the Final EA/EIR availability.
I.10	Division of Marine Fisheries	Appropriate shellfish mitigation sites are dependent on several factors. There may be areas within Boston Harbor that could support shellfish restoration. However, any shellfish seeding needs to be accomplished in areas not classified as Prohibited and containing the appropriate habitat conditions.	Massport has coordinated with the resource agencies to develop a shellfish mitigation plan. Shellfish mitigation would not occur in an area designated as Prohibited. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information on the shellfish mitigation program.
I.11	Division of Marine Fisheries	The loss of eelgrass resulting from the project may hinder ongoing efforts to improve water quality and restore habitats in Boston Harbor. Further avoidance, minimization and mitigation of eelgrass impacts are warranted. Mitigation plans discussed at the interagency meetings and presented in the DEIR document are preliminary and conceptual. A detailed site selection analysis, including light data and results of test-plot plantings should be included in the FEIR. Ongoing coordination with <i>Marine Fisheries</i> and other resource agencies is expected.	The Final EA/EIR provides a detailed explanation of the eelgrass mitigation program, which includes the transplanting of eelgrass from the footprint to the primary mitigation site at White Head Flats and at Old Harbor. A detailed site selection analysis was completed during the fall of 2010 and was reported on to the resource agencies at the December 17, 2010 Joint Working Group meeting. Ongoing coordination will occur during the permitting process and through the mitigation transplanting program. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
I.12	Division of Marine Fisheries	The noise and vibrations generated through piling installation may result in lethal and sublethal damage to fish species, particularly <i>Alosid</i> fish (i.e. river herring). As described in the DEIR Appendix 7, the impact is dependent on the type of equipment used. The analysis presented in the DEIR indicates that there will be noise levels produced by project work that could exceed the injury thresholds and alter fish behavior. Adherence to the no in-water work time-of-year restriction from February 15th to June 30th will minimize impacts to river herring. In addition to winter flounder, during the early spring as they aggregate and prepare for upstream migration. The use of cushion blocks and non-impact pile driving methods, as suggested in the DEIR, will also likely minimize noise impacts. We would like to see a commitment to using these best management practices in the FEIR.	Massport has committed to use cushion blocks and non-impact pile driving methods in order to reduce the noise and vibrations result from pile installation. Please refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.

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SEP 3 2010

MEPA

September 3, 2010

Ian A. Bowles, Secretary
Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
Attention: Anne Canaday, MEPA Office

RE: Boston-Logan International Airport Runway Safety Area Improvements Project
Draft Environmental Assessment/Draft Environmental Impact Report, EEA #14442

Dear Secretary Bowles:

The City of Boston Environment Department has reviewed the Draft Environmental Assessment/Draft Environmental Impact Report (Draft EA/DEIR) and offers the following comments.

The proponent, the Massachusetts Port Authority (Massport), is proposing to enhance Runway Safety Areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport to the extent feasible to achieve consistency with the Federal Aviation Administration's (FAA) current runway design criteria for RSAs and to improve rescue access to Boston Harbor in the event of an emergency. A three year construction schedule is planned in order to accommodate environmental and operational restrictions.

As did the Environmental Notification Form (ENF), the Draft EA/DEIR indicates that the proposed measures are safety improvements that will not extend runways or have an effect on normal runway operations, capacity or the types of aircraft that will use the runways.

Each preferred alternative will increase impervious surface, change stormwater patterns, alter and eliminate portions of the coastal bank and coastal beach, add fill to the Harbor, change wave direction and velocity, increase sedimentation and erosion and have substantial impacts upon coastal wetland resource areas and habitat by permanently removing salt marsh, eelgrass and shellfish beds. These impacts will affect marine life and the overall ecosystem that has been substantially improved at great cost through the Boston Harbor Improvement Project.

Construction of an inclined safety area extending into Boston Harbor is proposed for the Runway 22R end.

The preferred alternative for the Runway 33L end is the construction of a 600-foot long by 300-foot wide RSA with an Engineered Material Arresting System (EMAS) bed on a pile-supported deck over Boston Harbor. The purpose is to provide overrun and undershoot protection for a 747-400, the design aircraft. The Draft EA/DEIR presents five construction options and pile configurations for the Runway 33L deck. Massport should advance the pile configuration option which will minimize construction and operational impacts to coastal resource areas. Based upon the information provided in the document on pile footprint, pile type, scour and turbidity potential, and loss of coastal wetland

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resource areas, Option 3 should be pursued as the most viable deck design alternative. If deck piles are driven, Massport should employ a fish alarm system, similar to those used for marine blasting, to remove finfish from areas adjacent to the project site prior to use of impact equipment. This measure should be identified as part of construction-period Section 61 Findings.

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Construction barges accessing the Runway 33L work site will have adverse impacts upon eelgrass resource areas beyond the 66,600 s.f. of impact noted in the Draft EA/DEIR. To limit further disturbance of eelgrass Massport should restrict construction impacts within the eelgrass bed to the greatest extent practicable through staging project equipment and activities from landside locations, and the designation of 'least-impact' locations for barge staging during the project. The project contractor must be particularly sensitive to the northeast area of the proposed pier footprint, as the Eelgrass Survey for Runway 33L (Figure 3-6) represents the greatest densities of eelgrass at this location. Massport should consider transplanting dense stands of eelgrass within the deck footprint to less dense areas of the bed outside the immediate project area. Upon completion of construction, a post-construction eelgrass survey should be conducted to determine the extent of construction-phase damage. The mitigation plan should be modified to compensate for any additional loss of eelgrass related to construction activities.

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As mitigation plans and restoration site identification advance, Boston Harbor should continue to be prioritized for resource area mitigation and restoration efforts. Shellfish mitigation should first focus on transplanting and seeding shellfish within Boston Harbor and on measures to improve existing shellfish habitat, such as debris removal from tidal flats on Massport and other state agency properties. Additionally, efforts to identify possible eelgrass restoration/establishment sites should continue to prioritize the Harbor and adjacent bays given the significant efforts to improve water quality and the existence of healthy beds, such as that at the end of Runway 33L. As part of the eelgrass test plot planting program, deeper sites within Governors Island Flats and Deer Island Flats should be assessed as they are adjacent to the area of project impact and may possibly reduce potential bird hazards due to water depth.

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The Draft EA/DEIR references four locations that will be evaluated further for salt marsh mitigation: two sites in the Rumney Marsh Reservation in Saugus (EPA 4, 5); and, the Neponset River Reservation and Long Island in Boston. At a recent Joint Agency Work Group Meeting, Broad Meadow in Quincy and an area of the Belle Isle Marsh (VHB 14) in Winthrop were also referenced as potential mitigation sites. An assessment of all of the sites and the preferred alternative should be provided in the Final EA/FEIR. The mitigation actions at Broad Meadow and the Neponset Reservation would finish restoration projects that have been partially completed by other agencies. If one of these sites is advanced as the preferred option, guarantees must be established between all agencies involved to ensure that mitigation funding and resources are dedicated to the completion of the restoration project and meet mitigation requirements. The Draft EA/DEIR also references the establishment of areas of higher topography within mitigation sites to accommodate salt marsh transition which is anticipated with future sea level rise. The proposed elevated areas must be in addition to the restoration areas established through the salt marsh mitigation ratio.

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Massport should continue to review the feasibility of establishing artificial reefs within Boston Harbor as "out-of-kind" mitigation. The project will remove habitat important to lifecycle stages of several coastal species. Artificial reefs should be constructed if they can provide some of the same habitat functions and values that will be lost due to the project.

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The salt marsh and eelgrass mitigation working groups should assist in the development of the requirements and criteria for the mitigation monitoring reports. The groups should meet regularly during construction and mitigation activities to review the reports, assess the health of restoration

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sites and determine remedial measures in the event that restoration measures fail. The restoration monitoring reports should provide qualitative measures to ensure that mitigation actions and measures establish resource area functions and values that meet or exceed those lost through the project.

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Both preferred alternatives will adversely and permanently impact shellfish beds near Logan. While Massport has briefed and/or worked with local, state and federal agencies and met with two long-standing community groups, it is unclear if there has been dialogue with shellfishers and marine fishers about impacts and proposed mitigation. If so, we request that the substance of the contacts, including suggestions made by these stakeholders, be described in the FEIR. If dialogue has not yet occurred, we ask that it take place as soon as possible.

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The department requests that LID measures such as infiltration swales be implemented between the realigned access pathway and the coastal bank.

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We concur with other commentors that an Operations and Maintenance Plan should be developed, that one element be a description of expected life-span of the RSAs and that the way in which the life-span will be maximized. It should also address the impacts on resource areas associated with maintenance of the deck, inclined safety area, and access walkways.

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Rigorous construction-period containment measures and monitoring will be crucial to minimizing project related alterations to coastal resource areas. Construction phase and post construction monitoring plans and reporting must be established to assess the health of existing and restored resource areas. Contingencies should be in place to ensure that if restoration efforts fail, additional measures will be required to compensate for the loss of the resource area functions and values.

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This department has received numerous communications from East Boston residents about their concerns related to the project. Most see extensions into the Harbor as the first step in the taking of additional Harbor area and as runway and overall airport expansion, including the future conversion of RSA areas into runway areas then requiring new RSAs. This department has articulated to them, and expresses now, our support for the project's safety benefits. At the same time, we also appreciate the perspective of residential neighbors.

The Boston Transportation Department (BTD) has determined that two aircraft in the nation's commercial fleet, the A-380 and 747 Dash 8, may require RSAs in excess of those proposed. Staff is concerned that, therefore, an additional extension of the RSAs into the Harbor will be requested within several years. We share that concern.

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An additional issue raised by BTD concerns the level of use of Runway 22R for large jet arrivals since removal of the Blast Fence removed from the end of Runway 22R. The March 16, 2001 Agreement By and Between The Massachusetts Port Authority and The City of Boston states that existing restrictions on certain departures on Runway 4L and arrivals on Runway 22R would remain in place. The intent of the restrictions is to place limits on noise and they are spelled out in the agreement. The agreement also states that exemptions from the limits may be granted by Massport's "Executive Director under unusual operating circumstances such as when alternative runways are closed or otherwise unavailable or as required to accommodate emergencies." Regular reports of the use of Runway 22R for large jet arrivals are provided to BTD; staff believes that the use is not consistently connected to unusual circumstances.

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We mention this situation for the following reasons – community fears of expansion and capacity enhancement; a sense that an existing commitment not to alter normal runway use patterns as the

result of a changed condition is not working; a question that choices to allow large jets to land on Runway 22R is in the hands of the FAA and that the FAA is not bound to the exemption caveat in the agreement and will not be obligated in this case to maintain normal runway operations or the types of aircraft that will use the runways.

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This department looks forward to more information and responses to comments. Thank you for the opportunity to comment.

Sincerely,

Bryan Glascock
Commissioner

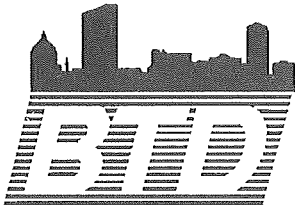
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Comment #	Author	Comment	Response
J.1	Boston Environment Department	Massport should advance the pile configuration option which will minimize construction and operational impacts to coastal resource areas. Based upon the information provided in the document on pile footprint, pile type, scour and turbidity potential, and loss of coastal wetland resource areas, Option 3 should be pursued as the most viable deck design alternative.	The range of direct impacts is very narrow for the five piling alternatives that have been advanced (generally between 500 - 1100 sf) and as such a very small component of the overall 33L RSA resource impacts. That said, Massport is working to identify the most reasonable alternative. Once the final design commences, because of the small range of the impacts, the decision will factor in constructability, minimization of impacts and cost.
J.2	Boston Environment Department	If deck piles are driven, Massport should employ a fish alarm system, similar to those used for marine blasting, to remove finfish from areas adjacent to the project site prior to use of impact equipment. This measure should be identified as part of construction-period Section 61 Findings.	A fish alarm system is a useful mitigation measure in connection with blasting. No blasting is proposed. Please refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information on mitigation measures.
J.3	Boston Environment Department	Construction barges accessing the Runway 33L work site will have adverse impacts upon eelgrass resource areas beyond the 66,600 s.f. of impact noted in the Draft EA/EIR. To limit further disturbance of eelgrass Massport should restrict construction impacts within eelgrass bed to the greatest extent practicable through staging project equipment and activities from landside locations, and the designation of 'least-impact' locations for barge staging during the project.	Construction barges would be located primarily within the footprint of the deck, an area that would be lost as a result of the project, or located outside of the eelgrass bed. Mitigation is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . A post-construction eelgrass mapping will be conducted to verify the limit of temporary and permanent construction impacts.
J.4	Boston Environment Department	The project contractor must be particularly sensitive to the northeast area of the proposed pier footprint, as the Eelgrass Survey for Runway 33L (Figure 3-6) represents the greatest densities of eelgrass at this location. Massport should consider transplanting dense stands of eelgrass within the deck footprint to less dense areas of the bed outside the immediate project area.	The proposed eelgrass mitigation program includes harvesting the eelgrass from the deck footprint and transplanting it at the primary and backup eelgrass mitigation sites. Mitigation is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
J.5	Boston Environment Department	Upon completion of construction, a post-construction eelgrass survey should be conducted to determine the extent of construction-phase damage. The mitigation plan should be modified to compensate for any additional loss of eelgrass related to construction activities.	Massport will undertake a post-construction survey of the eelgrass bed off of Runway 33L and provide a report to the resource agencies.
J.6	Boston Environment Department	As mitigation plans and restoration site identification advance, Boston Harbor should continue to be prioritized for resource area mitigation and restoration efforts. Shellfish mitigation should first focus on transplanting and seeding shellfish within Boston Harbor and on measures to improve existing shellfish habitat, such as debris removal from tidal flats on Massport and other state agency properties.	For both eelgrass and salt marsh, an extensive evaluation of potential sites within Boston Harbor and beyond was completed for the project and documented in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Eelgrass mitigation would occur in Boston Harbor at White Head Flats and at Old Harbor. Salt marsh mitigation would occur in Rumney Marsh, which is outside of Boston Harbor, but provides the opportunity to continue restoring Rumney Marsh as well as to work cooperatively with the Massachusetts Department of Conservation and Recreation.
J.7	Boston Environment Department	Additionally, efforts to identify possible eelgrass restoration/establishment sites should continue to prioritize the Harbor and adjacent bays given the significant efforts to improve water quality and the existence of healthy beds, such as that at the end of Runway 33L. As part of the eelgrass test plot planting program, deeper sites within Governors Island Flats and Deer Island Flats should be assessed as they are adjacent to the area of project impact and may possibly reduce potential bird hazards due to water depth.	Governor Island Flats and Deer Island Flats were considered as potential eelgrass mitigation sites. The Division of Marine Fisheries is conducting independent restoration efforts at these locations. Based on the site selection model utilized that assessed a number of sites identified by the Batelle Study and a Massachusetts Division of Marine Fisheries study (Estrella 2009), White Head Flats and Old Harbor were determined to have the greatest potential for successful eelgrass establishment. The resource agencies concurred with these sites at the December 2010 Joint Working Group meeting.

Comment #	Author	Comment	Response
J.8	Boston Environment Department	The Draft EA/DEIR references four locations that will be evaluated further for salt marsh mitigation: two sites in the Rumney Marsh Reservation in Saugus (EPA 4, 5); and, the Neponset River Reservation and Long Island in Boston. At a recent Joint Agency Work Group Meeting, Broad Meadow in Quincy and an area of Belle Isle Marsh (VHB 14) in Winthrop were also referenced as potential mitigation sites. An assessment of all the sites and preferred alternative should be provided in the Final EA/FEIR.	As described in Chapter 5, Proposed Mitigation and Section 61 Findings, after the filing of the Draft EA/EIR, Massport considered Rumney Marsh in Saugus, Neponset River Reservation, Long Island, and Broad Meadow in further detail. It was determined that EPA Sites 4 and 5 in Rumney Marsh would provide adequate mitigation at a reasonable cost. The resource agencies concurred with the selection of these sites during the December 2010 Joint Working Group meeting.
J.9	Boston Environment Department	The mitigation actions at Broad Meadow and the Neponset Reservation would finish restoration projects that have been partially completed by other agencies. If one of these sites is advanced as the preferred option, guarantees must be established between all agencies involved to ensure that mitigation funding and resources are dedicated to the completion of the restoration project and meet mitigation requirements.	Based upon guidance from the interagency Working Group, Massport determined that salt marsh mitigation would occur at EPA Sites 4 and 5 in Rumney Marsh.
J.10	Boston Environment Department	The Draft EA/DEIR also references the establishment of areas of higher topography within mitigation sites to accommodate salt marsh transition which is anticipated with future sea level rise. The proposed elevated areas must also be in addition to the restoration areas established through the salt marsh mitigation ratio.	The salt marsh mitigation plan proposed by Massport includes varying topography to provide a variety of wetland and habitat types. The salt marsh mitigation plan has been developed in consultation with the resource agencies, and provides the required mitigation ratio. Refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information.
J.11	Boston Environment Department	Massport should continue to review the feasibility of establishing artificial reefs within Boston Harbor as "out-of-kind" mitigation. The project will remove habitat important to lifecycle stages of several coastal species. Artificial reefs should be constructed if they can provide some of the same habitat functions and values that will be lost due to the project.	Based on the comments received from the resource agencies, Massport proposed a mitigation program focused on in-kind mitigation. As described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , Massport has determined that out-of-kind mitigation may be appropriate if the in-kind mitigation is unsuccessful.
J.12	Boston Environment Department	The salt marsh and eelgrass mitigation working groups should assist in the development of the requirements and criteria for the mitigation monitoring reports. The groups should meet regularly during construction and mitigation activities to review the reports, assess the health of restoration sites and determine the remedial measures in the event that restoration measures fail. The restoration monitoring reports should provide qualitative measures to ensure that mitigation actions and measures establish resource area functions and values that meet or exceed those lost through the project.	The Salt Marsh and Eelgrass Working Group members have provided input in the requirements and criteria for mitigation monitoring reports. Massport anticipates ongoing coordination with the Working Groups through out the permitting process, construction, and post-construction. Please refer to Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , for further information on the monitoring program.
J.13	Boston Environment Department	Both preferred alternatives will adversely and permanently impact shellfish beds near Logan. While Massport has briefed and/or worked with local, state, and federal agencies and met with two long-standing community groups, it is unclear if there has been dialogue with shellfishers and marine fishers about impacts and proposed mitigation. If so, we request that the substance of the contacts, including suggestions made by these stakeholders, be described in the FEIR. If dialogue has not yet occurred, we ask that it take place as soon as possible.	The Draft EA/EIR was distributed to Mr. Bob Stanley of Stanley Seafood, a local processor and distributor of seafood. Mr. Standley is the Master Digger in the Boston Harbor area, with a number of subordinates. Massport and the Massachusetts Division of Marine Fisheries held a briefing in December 2010 for local shellfishermen, where the shellfishers were able to provide input on the mitigation strategy proposed by Massport. Please refer to Chapter 7, <i>Public and Agency Coordination</i> , for more information on the meeting. As shown in Chapter 8, <i>Distribution List</i> , Massport provided a copy of the Final EA/EIR to Mr. Stanley and has informed the meeting attendees of the Final EA/EIR availability.

Comment #	Author	Comment	Response
J.14	Boston Environment Department	The department requests that LID measures such as infiltration swales be implemented between the realigned access pathway and the coastal bank.	Due to the proximity to Boston Harbor, groundwater elevations across the airfield are tidally influenced. Furthermore, much of the airport is constructed on reclaimed land and the resulting soils are unsuitable for recharge. The proposed stormwater management system does not include infiltration BMPs because infiltration is not occurring under existing conditions and is not feasible at this location because of inadequate separation from seasonal high groundwater and poor-quality fill materials. Please refer to Chapter 4, <i>Environmental Consequences</i> , Section 4.2.5.1 of the Final EA/EIR. The provision of any temporary detention areas on the airfield is inconsistent with Logan's Wildlife Hazard Management Plan.
J.15	Boston Environment Department	We concur with other commentors that an Operations and Maintenance Plan should be developed, that one element be a description of expected life-span of the RSAs and that the way in which the life-span will be maximized. It should also address the impacts on resource areas associated with maintenance of the deck, inclined safety area, and access walkways.	Operations and maintenance will be consistent with the existing Airport Operations Stormwater Pollution Prevention Plan (SWPPP). The operations and maintenance requirements for the proposed improvements are the same as those for other infrastructure already in operation at the Airport. Any alterations would be incorporated into the existing SWPPP currently in place for the Airport and would continue to be implemented under the existing NPDES Stormwater Permit.
J.16	Boston Environment Department	Rigorous construction-period containment measures and monitoring will be crucial to minimizing project related alterations to coastal resource areas. Construction phase and post construction monitoring plans and reporting must be established to assess the health of existing and restored resource areas. Contingencies should be in place to ensure that if restoration efforts fail, additional measures will be required to compensate for the loss of the resource area functions and values.	Rigorous construction-period containment measures and monitoring has been proposed to protect adjacent coastal resource areas. Construction phase and post-construction monitoring of coastal resource areas would occur. Massport has also proposed contingencies if restoration efforts are unsuccessful. These measures are described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
J.17	Boston Environment Department	The Boston Transportation Department (BTD) has determined that two aircraft in the nation's commercial fleet, the A-380 and 747 Dash 8, may require RSAs in excess of those proposed. Staff is concerned that, therefore, an additional extension of the RSAs into the Harbor will be requested within several years. We share that concern.	In response to this inquiry, Massport confirmed with FAA that both the A-380 and B747-800 are included in design category being used for this project.

Comment #	Author	Comment	Response
J.18	Boston Environment Department	<p>An additional issue raised by BTDC concerns the level of use of Runway 22R for large jet arrivals since removal of the Blast Fence removed from the end of Runway 22R. The March 16, 2001 <u>Agreement By and Between the Massachusetts Port Authority and the City of Boston</u> states that existing restrictions on certain departures on Runway 4L and arrivals on Runway 22R would remain in place. The intent of the restrictions is to place limits on noise and they are spelled out in the agreement. The agreement also states that exemptions from the limits may be granted by Massport's "Executive Director under unusual operating circumstances such as when alternative runways are closed or otherwise unavailable or as required to accommodate emergencies." Regular reports of the use of Runway 22R for large jet arrivals are provide to BTDC; staff believes the use is not consistently connected to unusual circumstances. We mention this situation for the following reasons - community fears of expansion and capacity enhancement; a sense that an existing commitment not to alter normal runway use patterns as the result of a changed condition is not working; a question that choices to allow large jets to land on Runway 22R is in the hands of the FAA and that the FAA is not bound to the exemption caveat in the agreement and will not be obligated in this case to maintain normal runway operations or the types of aircraft that will use the runways.</p>	<p>The R22R noise abatement rule limiting arrivals on R22R to aircraft that meet a specific decibel level (78 dba or less) is in effect and achieving its intended goal. In 2010 there was a total of about 150,000 jet arrivals at Boston Logan. During the same period 15 jet aircraft landed on R22R due to a combination of aircraft emergencies or FAA-ATC decisions to side-step jet aircraft to R22R and avoid a go-around. Massport investigates each arrival thoroughly and continues to work very closely with the FAA Tower, FAA TRACON and air carriers to reduce minimize R22R jet arrivals to the extent possible.</p>



BOSTON
TRANSPORTATION
DEPARTMENT

September 3, 2010

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MEPA

ONE CITY HALL PLAZA/ROOM 721
BOSTON, MASSACHUSETTS 02201
(617) 635-4680/FAX (617) 635-4295

Secretary Ian A. Bowles
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

And

Director Alicia Barton McDevitt
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

**Re: Boston-Logan International Airport Runway Safety Area Improvement
Project Draft Environmental Assessment/Environmental Impact Report
(EEA File #14442).**

Dear Secretary Bowles and Director McDevitt:

Please be advised that the Boston Transportation Department (BTD) has reviewed and hereby submits the following comments for your review.

The Massachusetts Port Authority (Massport) proposes to construct runway safety areas (RSA) at the end of Runways 22R and 33L. It is clearly understood these RSA's **will not** extend either runway or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways.

BTD is aware of the US Department of Transportation's Office of the Inspector General report that labeled Logan as one of the airports in the nation that needed to improve its runway safety areas. We obviously support this opinion, especially on Runway 33L where a Category 3 Landing System will be installed upon completion of the RSA Program.

In fact, BTD requested the installation of a Cat 3 System on Runway 33L over 20 years ago for the purpose of accommodating arrival traffic over water during severe inclement weather as well as providing noise relief for those communities under the Runway 4R arrival flight track during Cat 3 conditions.

THOMAS M. MENINO, Mayor

However, although we strongly support the RSA Improvement Program at Logan, we are concerned that we are concerned that long-standing restrictions on Runway 22R and Runway 4L are not being adhered to resulting in noise and air quality impacts on residential areas in East Boston.

K-1

Aircraft operations regarding arrival traffic on Runway 22R and departure traffic from Runway 4L have been severely restricted since the 1960s. The reason for the restriction is due to the close proximity of the Orient Heights neighborhood to this particular runway. In addition please note that there is no, and never has been, an Instrument Landing System (ILS) for this runway, no localizer, no glide slope. Therefore the only operations that could occur regarding departures off 4L or arrivals onto 22R would have to be performed under visual conditions. Currently, the only instrumentation for arrivals on 22R is a system called a Precision Approach Path Indicator (PAPI). This system can only be used during visual conditions. Also, only quiet prop aircraft are allowed to make these operations and even these are prohibited from landing on 22R or departing 4L between midnight and 6:00 AM. Based on the above, we hope you have a clear understanding of the restrictions on Runway 22R/4L that have been in place for now over 50 years.

In early 2001, the City of Boston entered into an agreement with Massport involving the removal of the "Blast Fence" located at the end of Runway 22R. The agreement was clear that operations on 22R/4L **would not** change once the blast fence was removed. **However through our analysis of the records it is clear that operations have in fact changed to the detriment of the quality of life of Orient Heights residents.**

Subsequent to the removal of the blast fence, arrivals of large jet transports began to occur on Runway 22R on a regular basis. For example, in 2009 there were 21 jet arrivals on 22R, thus far this year there have been 12 arrivals. We note that prior to the removal of the Blast Fence jet arrivals on 22R occurred very infrequently and indeed did not occur at all for several years. While we understand that there will be times when emergency situations dictate a jet arrival on 22R it is unacceptable that these events occur seemingly as a matter of convenience for the airlines, Massport and the FAA. The removal of the blast fence has therefore resulted in a dramatic increase in both noise and air quality impacts for residents of Orient Heights.

Furthermore, BTD absolutely rejects Massport's assertion that the arrival of jet powered aircraft on Runway 22R is better for noise abatement than a go-around. Aside from emergency situations, these events occur for two specific reasons: 1) FAA tower personnel failed to maintain separation standards for arriving aircraft. 2) Preventing a go-around saves the airlines costs in fuel consumption.

BTD has remained in contact with Massport regarding the dramatic increase of jet transport aircraft arrivals on Runway 22R. To this point, matters continue to deteriorate and progress appears to be nowhere in site.

BTD sincerely hopes the Executive Office of Energy and Environmental Affairs will include in their response to Massport's application to construct the RSA's, effective restrictions that will hold the agency accountable should jet arrivals increase even further once the RSA's become operational. It should be further noted, the restrictions mentioned in this letter regarding 22R arrivals and 4L departures are a major component of Massport's own 1986 Noise Rules listed under Section 24.05.

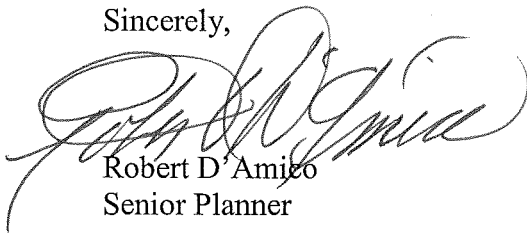
K-2

In closing, BTD sincerely hopes the upgraded RSA's will accommodate the A-380 and new 747 Dash 8 aircraft, otherwise we will return to this same issue in the near future. BTD continues to support initiatives at Logan Internal Airport that increase public safety and believe that safety measures can be achieved without increasing quality of life impacts on the surrounding residential neighborhoods.

K-3

If you have any questions, please feel free to call me at 617-635-3076.

Sincerely,



Robert D'Amico
Senior Planner

Comment #	Author	Comment	Response
K.1	Boston Transportation Department	However, although we strongly support the RSA Improvement Program at Logan, we are concerned that long-standing restrictions on Runway 22R and Runway 31L are not being adhered to resulting in noise and air quality impacts on residential areas in East Boston.	Massport acknowledges the comment from the Boston Transportation Department. The proposed RSA improvements would not extend the runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways. The proposed RSA Improvement Project would not result in any noise or air quality impacts on residential areas in East Boston except for temporary, construction-related impacts as described in Chapter 4, <i>Environmental Consequences</i> , of the Draft EA/EIR. Mitigation for those temporary construction-related impacts is described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
K.2	Boston Transportation Department	BTD sincerely hopes that the Executive Office of Energy and Environmental Affairs will include in their response to Massport's application to construct the RSAs, effective restrictions that will hold the agency accountable should jet arrivals increase even further once the RSAs become operational. It should be further noted, the restrictions mentioned in this letter regarding Runway 22R arrivals and 4L departures are a major component of Massport's own 1986 Noise Rules listed under Section 24.06.	The Logan RSA project is a safety initiative that will not change how the airfield or individual runways and taxiways can operate and will have no effect on restrictions current in effect.
K.3	Boston Transportation Department	In closing, BTD sincerely hopes the upgraded RSAs will accommodate the A-380 and new 747 Dash 8 aircraft, otherwise we will return to this same issue in the near future. BTD continues to support initiatives at Logan International Airport that increase public safety and believe that safety measures can be achieved without increasing quality of life impacts on the surrounding residential neighborhoods.	As noted above, in response to BTD's inquiry, Massport confirmed with FAA that both the A-380 and B747-800 are included in design category being used for this safety project. The proposed Logan Airport RSA Improvement Project is a safety improvement and would not increase impacts on the surrounding residential neighborhoods. The proposed RSA improvements would not extend the runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways. The proposed safety enhancements improve the chances that an aviation accident can be contained on the airfield, thereby reducing risks to aircraft passengers, aircraft and Boston Harbor.

3 September 2010

RECEIVED

SEP 3 2010

MEPA

Secretary Ian Bowles
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
ATT: MEPA Office

RE: EOE No. 14442- Draft Environmental Impact Report
Boston-Logan International Airport Runway Safety Area
Improvements Project

Dear Secretary Bowles:

The Boston Harbor Association, a non-profit, public interest organization founded in 1973 by the League of Women Voters and the Boston Shipping Association to promote a clean, alive, and accessible Boston Harbor, is in receipt of the Draft Environmental Impact Report for Boston-Logan International Airport Runway Safety Area Improvements Project. This project is designed to enhance the safety area at the ends of Runway 33L and Runway 22R, ensuring passenger safety in instances where there is an unintentional aircraft overrun, an aircraft undershoot, or when an aircraft veers off to one side of a runway.

The Boston Harbor Association is very supportive of measures to improve runway safety at Logan Airport, as proposed in this project. At the same time, TBHA strongly urges that the project proponent incorporate into the preferred alternatives for Runway 33L and Runway 22R measures which minimize impacts to Boston Harbor and its marine life and flora.

L-1

Background:

The proposed Runway 33L Runway Safety Area improvements include construction of a 600-foot long runway safety area on a 300-foot wide, 470-foot long pile-supported deck in Boston Harbor. Under the preferred alternative for Runway 33L, there would be impacts to coastal wetland resources, including Coastal Bank, Coastal Beach, Land Under the Ocean, and Submerged Aquatic Vegetation (eelgrass). Construction of any of the five options for Runway 33L will span three construction seasons with in-water (pile-driving) construction at a cost of \$64 million to \$74 million.

The proposed \$1.4 million Runway 22R Runway Safety Area improvement will include construction of an Inclined Safety Area consisting of crushed stone with a perimeter wall of stone-filled gabions, approximately 130 feet long and 500 feet

wide, extending from the existing perimeter road to the mean lower water elevation. In an emergency, the inclined safety area would allow the aircraft to transition, and would allow emergency vehicles safe access to the aircraft and passengers. Construction of this improvement will result in permanent adverse impacts to Coastal Bank, Salt Marsh, Coastal Beach, Land Under the Ocean, Land Containing Shellfish, and Land Subject to Coastal Storm Flowage.

As proposed, the two components of this project will have significant and permanent impacts upon coastal wetlands, salt marsh, and shellfish beds. While the Massachusetts Port Authority, project proponent, is working to minimize adverse impacts, there are still "unavoidable permanent impacts to coastal wetlands" (Page 4-1 of Draft Environmental Impact Report). The proposed improvements to Runway 33L will "directly and indirectly affect coastal wetlands resources over an area of approximately 3.65 acres" (page 4-2 of Draft EIR) and "likely result in the direct loss or impairment of approximately 60,100 square feet and the indirect loss or impairment of approximately 6,500 square feet of the eelgrass bed" (page 4-2 of Draft EIR).

The Draft EIR states, "The proposed Runway 22R ISA would have permanent impacts to coastal wetlands. The ISA, constructed with gravel fill, would replace coastal wetlands resources in an area of approximately 1.9 acres, including approximately 35,040 square feet of salt marsh" (page 4-3 of Draft EIR). Also, fish and shellfish habitat would be displaced, altered or eliminated by the pilings for Runway 33L, and approximately 62,370 square feet of Land Containing Shellfish will be lost due to the placement of fill as part of Runway 22R safety improvements.

TBHA's Comments:

The Boston Harbor Association's 10 August 2009 letter on the project's Environmental Notification Form asked that the preferred alternatives be examined for ways to minimize the adverse environmental impacts. TBHA's comment letter also noted that shellfish beds near Logan Airport and the Town of Winthrop, which would be impacted by the project, have re-opened in the last few years due to a cleaner Harbor.

In anticipation of the environmental permitting process, Massport convened in 2009 both an Eelgrass Mitigation Working Group and a Salt Marsh Mitigation Working Group comprised of state and federal agencies to examine mitigation measures for eelgrass and salt marsh impacts.

The Boston Harbor Association requests that the Secretary's Certificate require the project proponent to continue to further refine the preferred alternatives in an effort to minimize adverse impacts to the flora and fauna to the maximum degree possible. To compensate for adverse impacts to salt marsh resources which can not be avoided, we ask that the Secretary require no less than a 2:1 ratio or

L-2



higher ratio for emergent wetlands, with first priority for the restoration or re-establishment of existing wetlands, and a higher mitigation ratio (DEP has required up to 10:1 ratio) if enhancement of existing salt marsh is required.

↑ L-2
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Because of bird hazard risks, off-site, rather than on-site, mitigation of salt marsh impacts will be pursued. From a list of forty potential salt marsh mitigation sites (Table 5.2-1 of Draft EIR), twelve sites are recommended for further review as potential mitigation sites. Seven of these sites are within Rumney Marsh Reservation. If a site in Rumney Marsh is selected, we ask that mitigation be done in a manner consistent with EOEAs "Rumney Marsh's Area of Critical Environmental Concern: Salt Marsh Restoration Plan" (2002) and in close coordination with the Department of Conservation and Recreation, which is actively working to improve public amenities to the Marsh as well as other potential mitigation sites listed. Of potential mitigation sites, we support inclusion of the Granite Avenue site, Boston, Neponset River Reservation; Belle Isle Marsh, Winthrop; and Long Island, Boston Harbor Islands national park area.

L-3

L-4

For eelgrass, both the U.S. Army Corps of Engineers, New England District, and MA Department of Environmental Protection have indicated that a mitigation ratio in excess of 1:1 will be required. The Army Corps' Addendum to the New England District Compensatory Mitigation Guidance recommends a compensatory mitigation range of 3:1 to 5:1 for Submerged Aquatic Vegetation/ eelgrass (page 5-26 of Draft EIR), which we support as the minimum compensatory mitigation range.

L-5

The Draft EIR provides few details about sites which the project proponent is recommending for eelgrass restoration. Governors Island Flats, Deer Island Flats, Peddocks Island (south), and Long Island (west) are noted as suitable for eelgrass restoration (page 5-33 of Draft EIR), but are not proposed by the project proponent at this time as eelgrass restoration sites.

We ask that the Secretary's Certificate continue to require the project proponent to minimize impacts to eelgrass in the preferred alternatives, as well as require the Final Environmental Impact Report to identify the site of eelgrass re-establishment/restoration at a minimum of a 3:1 ratio or higher ratio in consultation with the Eelgrass Mitigation Working Group and environmental and community representatives.

L-6

The preferred alternatives will adversely and permanently impact shellfish beds near Logan Airport and the Town of Winthrop. TBHA's comment letter on the project's Environmental Notification Form asked that the project proponent provide shellfishing representatives copies of all future environmental impact documents and decisions related to this project and consider a briefing for local shellfishing representatives. Because of the permanent impacts to land containing shellfish from this project, we ask that the Secretary's Certificate require the proponent to hold a briefing for local shellfishing representatives and

L-7
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other marine fisheries representatives prior to the filing of the Final Environmental Impact Report. The Final EIR should consider recommendations made at the briefing, as well as those provided by federal, state, and city agencies including but not limited to the Boston Environment Department, MA Division of Marine Fisheries, MA Office of Coastal Zone Management, National Marine Fisheries Service, and U.S. Fish and Wildlife Service.

L-7
cont'd.

L-8

Because of the permanent adverse impacts to wetland resources as well as the proposed new fill and structures for nonwater-dependent use seaward of the mean high water mark, variances will be required to the Wetlands Protection Act and to the Massachusetts Public Waterfront Act-Chapter 91. In order to consider such variance requests, we ask that the Secretary's Certificate require the project proponent to more fully detail how the preferred alternatives can further reduce impacts to wetlands, tidelands, and lands containing shellfish through project design.

L-9

TBHA's comment letter on the project's Environmental Notification Form requested detailed information on stormwater management for the runways to help ensure sound water quality in Boston Harbor. Because the proposed project requires work within wetland resource areas and buffer zones, the project must comply with the Commonwealth's 2008 Stormwater Management Standards. We ask that the Secretary's Certificate require the project proponent to provide greater detail about how it will comply with the 2008 Stormwater Management Standards, particularly Standards 1, 3, 7, and 9.

L-10

As part of the required information, a detailed Operations and Maintenance Plan should also be provided in the Final EIR, including information on the expected life-span of this project. Runway Safety Area improvements had been made to Runway 22R as recently as 2005, and every attempt should be made to extend the life of this project as long as possible, both for cost saving purposes as well as to minimize short-term adverse construction impacts as well as long-term, permanent adverse impacts.

L-11

Finally, we request that the Secretary's Certificate require the project to outline in the Final EIR environmental sustainability measures which will be implemented as part of this project, consistent with Massport's leadership in this area at its other facilities. This should include short-term sustainability measures, such as those related to the construction phase, as well as long-term sustainability measures. The latter can include the project proponent's commitment as part of this project to plant new trees off-site, reinforcing the City of Boston's Climate Action Plan to ensure that 100,000 trees are planted by 2020 to cool local neighborhoods.

L-12

Thank you for your consideration. We look forward to the timely approval of this public safety project following the additional information and mitigation measures suggested.

Sincerely,

Vivien Li
Executive Director
The Boston Harbor Association

Comment #	Author	Comment	Response
L.1	The Boston Harbor Association	At the same time, TBHA strongly urges that the project proponent incorporate into the preferred alternatives for Runway 33L and Runway 22R measures which minimize impacts to Boston Harbor and its marine life and flora.	As stated in Chapter 2, <i>Alternatives Analysis</i> , of the Final EA/EIR further minimization is not practicable in light of the project's purpose and is contrary to the FAA's determinations for Runway 33L end and Runway 22R end. As final design proceeds, opportunities to further reduce construction and permanent impacts will be sought.
L.2	The Boston Harbor Association	The Boston Harbor Association requests that the Secretary's Certificate require the project proponent to continue to further refine the preferred alternatives in an effort to minimize adverse impacts to the flora fauna to the maximum degree possible. To compensate for adverse impacts to salt marsh resources which can not be avoided, we ask that the Secretary require no less than a 2:1 ratio or higher ratio for emergent wetlands, with first priority for the restoration or re-establishment of existing wetlands, and a higher mitigation ratio (DEP has required up to 10:1 ratio) if enhancement of existing salt marsh is required.	As stated in Chapter 2, <i>Alternatives Analysis</i> , of the Final EA/EIR further minimization is not practicable in light of the project's purpose and is contrary to the FAA's determinations for Runway 33L end and Runway 22R end. Massport will provide a 2:1 mitigation ratio for salt marsh and 3:1 for eelgrass resources as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . As final design proceeds, opportunities to further reduce construction and permanent impacts will be sought.
L.3	The Boston Harbor Association	If a site in Rumney Marsh is selected, we ask that mitigation done in a manner consistent with EOE's "Rumney Marsh's Area of Critical Environmental Concern: Salt Marsh Restoration Plan" (2002) and in close coordination with the Department of Conservation and Recreation, which is actively working to improve public amenities to the Marsh as well as other potential mitigation sites listed.	EPA Sites 4 and 5 in Rumney Marsh were chosen as the preferred location for salt marsh mitigation. Mitigation in Rumney Marsh will be completed in close coordination with the U.S. Environmental Protection Agency and cooperatively with the Massachusetts Department of Conservation and Recreation. Mitigation would be completed in a manner consistent with the "Rumney Marsh's Area of Critical Environmental Concern: Salt Marsh Restoration Plan," dated 2002.
L.4	The Boston Harbor Association	Of potential mitigation sites, we support inclusion of the Granite Avenue site, Boston, Neponset River Reservation; Belle Isle Marsh, Winthrop; and Long Island, Boston Harbor Islands national park area.	As described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> , after the filing of the Draft EA/EIR, Massport considered Rumney Marsh in Saugus, Neponset River Reservation, Long Island, and Broad Meadow in further detail. It was determined that EPA Sites 4 and 5 in Rumney Marsh would provide adequate mitigation at a reasonable cost. The resource agencies concurred with the selection of these sites during the December 2010 Joint Working Group meeting.
L.5	The Boston Harbor Association	For eelgrass, both the U.S. Army Corps of Engineers, New England District, and MA Department of Environmental Protection have indicated that a mitigation ratio in excess of 1:1 will be required. The Army Corps' Addendum to the New England District Compensatory Mitigation Guidance recommends a compensatory mitigation range of 3:1 to 5:1 for Submerged Aquatic Vegetation/eelgrass (page 5-26 of Draft EIR), which we support as the minimum compensatory mitigation range.	Massport will provide a 3:1 mitigation ratio for eelgrass as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
L.6	The Boston Harbor Association	We ask that the Secretary's Certificate continue to require the project proponent to minimize impacts to eelgrass in the preferred alternatives, as well as require the Final Environmental Impact Report to identify the site of eelgrass re-establishment/restoration at a minimum of a 3:1 ratio or higher ratio in consultation with the Eelgrass Mitigation Working Group and environmental and community representatives.	Massport will provide a 3:1 mitigation ratio for eelgrass as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> . Eelgrass restoration would occur at White Head Flats and at Old Harbor, which have received consensus from the Eelgrass Working Group in December 2010.
L.7	The Boston Harbor Association	Because of the permanent impacts to land containing shellfish from this project, we ask that the Secretary's Certificate require the proponent to hold a briefing for local shellfishing representatives and other marine fisheries representatives prior to the filing of the Final Environmental Impact Report.	Massport held a briefing in December 2010 on the proposed project for local shellfishermen, where the shellfishers were able to provide input both on the project impacts and mitigation strategy proposed by Massport (see Chapter 7, <i>Public and Agency Coordination</i>). As shown in Chapter 8, <i>Distribution List</i> , Massport provided a copy of the Final EA/EIR to Mr. Bob Stanley, of Stanley Seafood, and has informed the meeting attendees of the Final EA/EIR availability.

Comment #	Author	Comment	Response
L.8	The Boston Harbor Association	The Final EIR should consider recommendations made at the [shellfishing community] briefing, as well as those provided by federal, state, and city agencies including but not limited to the Boston Environment Department, MA Division of Marine Fisheries, MA Office of Coastal Zone Management, National Marine Fisheries Service, and U.S. Fish and Wildlife Service.	The proposed shellfish mitigation program has been developed in close consultation with a number of local, state, and federal agencies, including many of the ones listed by the commentor.
L.9	The Boston Harbor Association	Because of the permanent adverse impacts to wetland resources as well as the proposed new fill and structures for nonwater-dependent use seaward of the mean high water mark, variances will be required to the Wetlands Protection Act and to the Massachusetts Public Waterfront Act – Chapter 91. In order to consider such variance requests, we ask that the Secretary's Certificate require the project proponent to more fully detail how the preferred alternatives can further reduce impacts to wetlands, tidelands, and land containing shellfish through project design.	As stated in Chapter 2, <i>Alternatives Analysis</i> , of the Final EA/EIR further minimization is not practicable in light of the project's purpose and is contrary to the FAA's determinations for Runway 33L end and Runway 22R end. Massport will provide a 2:1 mitigation ratio for salt marsh as described in Chapter 5, <i>Proposed Mitigation and Section 61 Findings</i> .
L.10	The Boston Harbor Association	TBHA's comment letter on the Environmental Notification Form requested detailed information on stormwater management for the runways to help ensure sound water quality in Boston Harbor. Because the proposed project requires work within wetland resource areas and buffer zones, the project must comply with the Commonwealth's 2008 Stormwater Management Standards. We ask that the Secretary's Certificate require the project proponent to provide greater detail about how it will comply with the 2008 Stormwater Management Standards, particularly Standards 1, 3, 7, and 9.	Greater detail is provided in the Final EA/EIR on stormwater management. Please refer to Chapter 4, <i>Environmental Consequences</i> , Sections 4.2.5 and 4.3.5 for Runway 33L and Runway 22R, respectively. Chapter 6, <i>Regulatory Compliance</i> , provides statements of compliance with the Stormwater Standards for both Runway 33L and Runway 22R.
L.11	The Boston Harbor Association	As part of the required information, a detailed Operations and Maintenance Plan should also be provided in the Final EIR, including information on the expected life-span of this project. Runway Safety Area improvements had been made to Runway 22R as recently as 2005, and every attempt should be made to extend the life of this project as long as possible, both for cost saving purposes as well as to minimize short-term adverse construction impacts as well as long-term, permanent adverse impacts.	Operations and maintenance will be consistent with the existing Airport Operations Stormwater Pollution Prevention Plan (SWPPP). The operations and maintenance requirements for the proposed improvements are the same as those for other infrastructure already in operation at the Airport. Any alterations would be incorporated into the existing SWPPP currently in place for the Airport and would continue to be implemented under the existing NPDES Stormwater Permit.
L.12	The Boston Harbor Association	Finally, we request that the Secretary's Certificate require the project to outline in the Final EIR environmental sustainability measures which will be implemented as part of this project, consistent with Massport's leadership in this area at its other facilities. This should include short-term sustainability measures, such as those related to the construction phase, as well as long-term sustainability measures. The latter can include the project proponent's commitment as part of this project to plant new trees off-site, reinforcing the City of Boston's Climate Action Plan to ensure that 100,000 trees are planted by 2020 to cool local neighborhoods.	Massport will incorporate sustainability measures into the design and construction of the proposed project, consistent with Massport's <i>Sustainable Design Standards and Guidelines</i> (June, 2009).

Canaday, Anne (EEA)

From: EastieGails@aol.com
Sent: Friday, September 03, 2010 4:42 PM
To: Canaday, Anne (ENV); colarusso.phil@epamail.epa.gov
Cc: Petruccelli, Anthony (SEN); Basile, Carlo (HOU); salvatore.lamattina@cityofboston.gov
Subject: EEA #14442

Dear Ms. Canaday:

I am responding to the Draft EIR for the Runway Safety Areas proposed for Logan Airport.

While the public fully realizes the need for safety, the public also is cognizant of the fact that everyone can and should play a role in mitigating impacts. Realizing that one of the most significant concerns in this project is the destruction of eelgrass, I am also proposing that in replicating areas for eelgrass beds, or other mitigation efforts, Massport could and should consider the manner in which, or lack thereof, deicing effluents are treated (in this case, I believe that Massport is attempting an exclusion of such.

M-1
↓

I refer to the lawsuit decided in:

USA, Plaintiff

v.

Maryland Aviation Administration, A Unit of the Maryland Department of Transportation, an agency of the State of Maryland, Defendant

and

Natural Resources Defense Council, Inc., Airport Environmental Coalition, Humane Society of the United States, and, US Citizens Aviation Watch, Plaintiff,

v.

David L. Blackshear, in his official capacity as Executive Director of the Maryland Aviation Administration, Defendant.

A consent decree was entered into whereby the airport agreed to treat and monitor airport deicing effluents.

As mitigation is being determined, I would suggest that a duplicate treatment and monitoring system be mandated as in the above lawsuit's consent decree. Massport does claim that it wants to be this example of a green model and I know of no better example than to protect our ocean waters, in light of the fact that a massive cleanup project was undertaken by the MWRA, paid for by the citizens themselves, many of whom use our beaches in the harbor.

M-1
↑
cont'd.

The Federal EPA unveiled deicing regulations in the earlier part of the year. Massport could and should embrace correcting their deficient practices now rather than navigating the regulatory processes in its effort to show the communities surrounding the airport that they are truly good neighbors.

Thank you for the opportunity to comment.

Gail C. Miller

Comment #	Author	Comment	Response
M.1	Gail C. Miller	<p>Realizing that one of the most significant concerns in this project is the destruction of eelgrass, I am also proposing that in replicating areas for eelgrass beds, or other mitigation efforts, Massport could and should consider the manner in which, or lack thereof, deicing effluents are treated (in this case, I believe that Massport is attempting an exclusion of such). As mitigation is being determined, I would suggest that a duplicate treatment and monitoring system be mandated as in the above lawsuit's consent decree. Massport does claim that it wants to be this example of a green model and I know of no better example than the protect our ocean waters, in light of the fact that a massive cleanup project was undertaken by MWRRA, paid for by the citizens themselves, many of whom use our beaches in the harbor. The Federal EPA unveiled deicing regulations in the earlier part of the year. Massport could and should embrace correcting their deicing practices now rather than navigating the regulatory processes in its effort to show communities surrounding the airport that they are truly good neighbors.</p>	<p>Massport will comply with the pending EPA regulations, once issued.</p>



Appendix 4

Agency Correspondence

- Massachusetts Department of Environmental Protection
- Massachusetts Division of Marine Fisheries
- Massachusetts Historical Commission
- Massachusetts Natural Heritage and Endangered Species Program
- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
- U.S. Fish and Wildlife Service



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Massachusetts Department of Environmental Protection



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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

June 22, 2010

Stewart Dalzell
Massachusetts Port Authority
One Harborside Drive
Boston, MA 02128

Re: Wetland Variance Request
Logan Airport Runway Safety Area Improvement Project

Dear Mr. Dalzell,

The Massachusetts Department of Environmental Protection (MassDEP) is in receipt of the above referenced Variance request following the issuance of a Superseding Order of Conditions (SOC) denying the project. The SOC denial was based on preliminary documents and plans (including stormwater and resource mitigation) as well as information gathered during meetings regarding the Federal Aviation Administration (FAA) requirements for Runway Safety Areas (RSA). No more detailed information or plans were included as part of the Variance request beyond what was provided as part of the SOC appeal.

The information required for consideration of a request for a Wetland Protection Act Variance has yet to be developed in sufficient detail for us to adequately review and approve of your Variance Request. Until such time as the MassDEP receives design-level plans depicting resource area impacts and mitigation in sufficient detail, and construction and operational specifications and practices, this Variance review is suspended. The Variance review will commence when the detailed information is submitted. To that end, the MassDEP will continue its participation in Massport's on-going interagency mitigation working groups related to the development of salt marsh and eelgrass mitigation sites and we will continue to support all requests to review and provide input into other components of the project.

As you are aware, MassDEP has been an active participant in Massport's interagency task force since March 2009 for the purpose of coordinating agency review on the environmental impact and mitigation design for this project. As noted in your request, the project is currently undergoing public review under the National Environment Policy Act (NEPA) and Massachusetts Environmental Policy Act (MEPA). It is the Department's expectation that the

NEPA/MEPA review will generate considerable information to address how the project proponent intends to comply with various statutes administered by MassDEP. Therefore, your variance request is premature since it does not contain the information needed to expedite your permit request and to ensure avoidance, minimization and mitigation of wetland impacts.

Specifically, in order to consider your Variance Request further, it is necessary to provide the following information:

- the completed alternatives analysis under the NEPA/MEPA review and additional documentation of any other NEPA/MEPA issues that arise during this process;
- ~~demonstration of compliance with FAA design criteria for RSAs and documentation of communications to and from the FAA relative to RSA modification of standards in order to minimize environmental impacts of the project;~~
- demonstration of how the project will comply with the provisions of the Wetlands Protection Act, M.G.L., C. 131, Section 40, and its implementing regulations including but not limited to the variance requirements at 310 CMR 10.05(10) requiring the establishment of overriding public interest; avoidance and minimization measures considered as part of the project design and an explanation for why certain measures were accepted or rejected;
- detailed discussion of the proposed mitigation measures, design plans and specifications for salt marsh and eelgrass mitigation, as detailed below and proposed mitigation measures for anticipated impacts to salt marsh (310 CMR 10.32), land under water (310 CMR 10.25), and destruction of eelgrass in particular (310 CMR 10.25(6)(b)) and all other resource areas being impacted by the proposed project including design plans and specifications for salt marsh and eel grass mitigation, as further detailed below;
- detailed stormwater calculations describing how the project will comply with MassDEP's stormwater management standards, and submission of a Stormwater Pollution Prevention Plan (SWPPP). Include in your analysis evaluation of stormwater runoff from the pile-held RSA, an assessment as to where it is to be directed and the effects on salt marsh, eelgrass, shellfish beds, and/or tidal substrate.
- the applicant must demonstrate which Environmentally Sensitive Site Design (ESSD) and Low Impact Development (LID) measures have been considered to meet the Stormwater Standards pursuant to 310 CMR 10.05(6)(n) and of those considered, which specific ESSD/LID practices are proposed as part of the Variance request. Further, the applicant must identify and remove all illicit discharges to the stormwater drainage system pursuant to 310 CMR 10.05(6)(k)(10), and provide written certification of such.
- submission of the Water Quality Certification application including documentation of how the project meets the regulation requirements of 314 CMR 9.00 and the associated criteria for the evaluation of applications for discharge of dredged or fill material to salt marsh and land under water 310 CMR 9.06;.
- documentation of how the project will comply with Chapter 91 licensing requirements referenced at 310 CMR 9.03(3) or through a demonstration that the project meets the requirements for a Waterways variance pursuant to the provisions of 310 CMR 9.21.

Eelgrass Mitigation:

In order to achieve the proposed 3:1 eelgrass replacement ratio, documentation must be developed and submitted which identifies a comprehensive protocol for how Massport intends to choose suitable transplant sites. The protocol should include the following:

- an updated map of the aerial extent and density of eelgrass habitat in the project area conducted during the growing season (July/August) prior to construction;
- final estimates of direct eelgrass impacts from the project and indirect impacts from shading, sediment deposition outside of the footprint, and anticipated impacts from construction barges;

- steps that will be taken to minimize and/or eliminate the risk of impacts from construction vessels including an analysis regarding the feasibility of limiting barge use to periods of high tide to avoid grounding of barges on eelgrass habitat and the use buoys to mark construction corridors to contain vessels movements;
- sufficient documentation to ensure the success of any proposed eelgrass mitigation. Appropriate factors for consideration should be consistent with recently described methodologies¹ critical to the success of eelgrass restoration efforts;
- an assessment of the potential eelgrass sites (including the Deer Island Flats and Governor's Island Flats) identified by the Batelle study conducted as part of the HubLine project and a discussion on how this information may be used to assist Massport in choosing suitable transplant sites;
- include a survey of any other sites in the outer harbor not assessed in the Batelle study with appropriate physical and biological site characteristics that optimize eelgrass survival;
- an evaluation of how healthy eelgrass plant stock in the footprint of the construction area could be used as a donor source including a proposed plan for the effective harvesting, transporting, and transplanting of eelgrass from donor beds to be impacted by the project; including a timetable that incorporates upfront mitigation in anticipation that the timing of the construction and the timing of the optimal transplanting time for eelgrass will not align.
- a commitment to pre-construction and long term post-construction monitoring of any proposed mitigation site;
- a determination from the U.S. Department of Agriculture - Wildlife Services as to whether eelgrass habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and whether a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139;
- a monitoring plan that will enable applicant to evaluate and report on transplanting success; define the criteria to be used for measuring the success of the restoration effort including the factors that ensure a level of restoration that is comparable to the existing

¹ Leschen, A. S. et al., 2010, Successful Eelgrass (*Zostera marina*) Restoration in a Formerly Eutrophic Estuary (Boston Harbor) Supports the Use of a Multifaceted Watershed Approach to Mitigating Eelgrass Loss: Estuaries and Coasts.

Short, F.T. et al., 2002, Site selection model for optimal restoration of eelgrass, *Zostera marina* L. Marine Ecology Progress Series 227: 253-267.

characteristics of resource area to be impacted (i.e. root/shoot density and the aerial extent of the existing eelgrass meadow);

- the anticipated length of time necessary to ensure successful restoration (i.e. the percentage of successful re-establishment of eelgrass anticipated for the one, three, and five-year timeframe);
- a remedial plan to be undertaken in the event that initial restoration efforts fail.

Salt Marsh Mitigation:

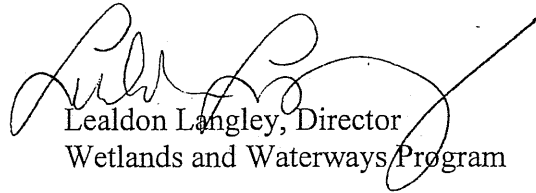
The information contained in the *Salt Marsh Mitigation Site Evaluation Report*, June 2010 should be supplemented as follows. In order to achieve the 2:1 salt marsh replacement ratio, documentation must be developed and submitted which identifies a comprehensive protocol for how Massport intends to choose and develop suitable replication sites. The salt marsh replacement plans shall provide:

- plan views, cross-sections, final planting plans, and a monitoring plan;
- the size and location of the existing and replicated wetland, at a scale in the range of 1"=10' to 1"=40", and shall include easily identifiable landmarks such as surveyed flag locations, benchmarks, or structures;
- contour lines at 2' intervals for existing areas and 1' intervals for proposed areas;
- sufficient number of spot elevations to describe the topography of the wetland and the surrounding area;
- the locations of soil test pits and vegetation plots;
- cross-sections of the existing and proposed wetland subsurface, showing soil types, depths, and locations using both horizontal and vertical scales.
- provisions that the replacement area be located in the same general area or water body as the area lost, at a minimum replacement ratio of 2:1, unless a determination is provided from the U.S. Department of Agriculture - Wildlife Services that salt marsh habitat constitutes an attractive wildlife nuisance as contemplate by FAA Advisory Circular: 150/5200-33B and whether a need exists to conduct a Wildlife Hazard Assessment (WHA) in accordance with Part 139;
- replacement locations that are not tidally restricted by any pipe, culvert, bridge, roadway or other development and are not near areas colonized by invasive species;
- grade elevations below the highest spring tides of the year with portions below mean high tide, with the exception of slope transitions;
- internal sloped drainage creeks not necessarily required to drain fully at low tide;
- panne areas with suitable depths to provide killifish refuge habitat;
- provisions for assessments of potential contamination if the proposed salt marsh restoration sites containing dredged spoils;

Depending on project specifics, proposed salt marsh restoration mitigation that involves the enlargement, removal, or replacement (with tide gates) of culvert tidal restrictions may be acceptable for meeting some portion of the salt marsh mitigation requirement.

MassDEP reserves the right to request additional information as project design, plans, and calculations are developed for the purpose of MEPA/NEPA, the statutes and regulations cited above, and for compliance with the requirements of a wetland variance.

Sincerely,



Lealdon Langley, Director
Wetlands and Waterways Program

Cc: Michael Stroman, MassDEP/Boston
Lisa Rhodes, MassDEP/Boston
Rachel Freed, MassDEP/NERO
Chris Busch, Boston Conservation Commission
✓ Lisa Standley, VHB
Kathryn Ford, MDMF
Phil Colarusso, EPA
Ed Reiner, EPA
Chris Boelke, NOAA



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Massachusetts Division of Marine Fisheries



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Paul J. Diodati
Director

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street, Suite 400

Boston, Massachusetts 02114

(617)626-1520

fax (617)626-1509



Deval Patrick
Governor

Ian A. Bowles
Secretary

December 4, 2007

Gene F. Crouch
Senior Environmental Scientist
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, Mass 02471

Re: Logan International Airport Runway Safety Area Improvements Project, Boston, MA

Dear Mr. Crouch,

The Massachusetts Division of Marine Fisheries (*Marine Fisheries*) has received your request for resource information for the Logan Runway Safety Area Improvements project site in Boston, MA. Runway safety area enhancements are proposed at the ends of runway 22R and 33L at Boston Logan International Airport. Proposed work may include solid fill or pile supported structures to extend over intertidal and subtidal waters of Boston Harbor. We have reviewed the locus map and brief description of the proposed work and provide the following comments concerning marine fisheries resource areas at the project site.

The intertidal mudflats surrounding Logan Airport are part of shellfish area GBH5.3, conditionally restricted, available for commercial harvest with controlled rely or depuration, subject to local rules and regulations. This area provides habitat for soft-shell clams (*Mya arenaria*) and blue mussels (*Mytilus edulis*). *Marine Fisheries* trawl surveys, anecdotal observations and species life-history characterizes all indicate that near-shore areas of Boston Harbor provide important habitat for winter flounder (*Pleuronectes americanus*), a commercially and recreationally significant fish in New England waters, and for Alewives (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*) and rainbow smelt (*Osmerus mordax*).

In addition to fisheries species, Logan Airport hosts several important habitat resources including saltmarsh, mudflats and eelgrass beds. Eelgrass (*Zostera marina*), a subtidal flowing plant and important habitat for many marine fisheries species, was mapped by DEP in 1995 and 2001 off of runway 33L. Ground truthing was performed by CR Environmental in 2007, resulting in a more detailed map showing eelgrass extending further in-shore and further west along the shore.

Thank you for requesting information about the marine fisheries resources at your project site. Please contact me at our Gloucester office at (978)-282-0308 x. 168 if you have any questions about this review.

Sincerely,

Tay Evans
Marine Fisheries Biologist



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Massachusetts Historical Commission



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November 7, 2007

Vanasse Hangen Brustlin, Inc.

Ref: 09980.03

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

Re: Logan International Airport Runway Safety Area Improvements Project
Boston, Massachusetts

Walter L. Maros 12/7/07
Date
**Walter L. Maros
Preservation Planner
Massachusetts Historical Commission**

Dear Ms. Simon,

On behalf of the Massachusetts Port Authority (Massport), Vanasse Hangen Brustlin, Inc. is collecting environmental data in support of Federal Aviation Administration (FAA)-required Runway Safety Area (RSA) improvements at Boston Logan International Airport. The project will potentially extend into Boston Harbor in Boston, Massachusetts at two locations as briefly described below.

The proposed project is to construct federally-required runway safety area enhancements at the ends of two existing runways, 22R and 33L at Boston Logan International Airport, as illustrated on the attached figure. Design of the RSAs has not been finalized but may include a solid fill or pile supported structure within the marine environment. The purpose of the project is to provide an additional measure of safety and better meet FAA safety standards.

The proposed safety improvements will not change runway length or how the runway can be used and therefore will not change any of the operating conditions at Logan Airport. Similarly, the proposed safety improvements are expected to affect areas previously disturbed for construction of the airport. Accordingly, no construction or operational impacts to historic or cultural resources are anticipated for the proposed safety improvements.

VHB requests that the Massachusetts Historical Commission review the enclosed materials at its earliest convenience and provide any comments that the Commission wishes to make regarding this project. If you have any questions concerning the enclosed project information, please feel free to contact me at 617-924-1770.

Sincerely,
VANASSE HANGEN BRUSTLIN, INC.

Gene F. Crouch
Senior Environmental Scientist

Attachment: Locus Map

101 Walnut Street
Post Office Box 9151
Watertown, Massachusetts 02471-9151
617.924.1770 • FAX 617.924.2286
email: info@vhb.com
www.vhb.com

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Massachusetts Natural Heritage and Endangered Species Program



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Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

February 17, 2010

Boston Conservation Commission
Boston Environment Department
Boston City Hall, Room 805
Boston MA 02201

RE: Applicant: Stewart Dalzell, Massachusetts Port Authority
Project Location: Logan International Airport
Project Description: Logan Runway Safety Area Improvements Project
DEP Wetlands File No.: unavailable
NHESP Tracking No.: 07-23682

Dear Commissioners & Applicant:

The applicant listed above has submitted a Notice of Intent with site plans to the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife, in compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.37).

MA WETLANDS PROTECTION ACT (WPA)

Based on a review of the information that was provided and the information that is currently contained in our database, the NHESP has determined that this project, as currently proposed, **will not adversely affect** the actual Resource Area Habitat of state-protected rare wildlife species. Therefore, it is our opinion that this project meets the state-listed species performance standard for the issuance of an Order of Conditions.

Please note that this determination addresses only the matter of **rare** wildlife habitat and does not pertain to other wildlife habitat issues that may be pertinent to the proposed project.

MA ENDANGERED SPECIES ACT (MESA)

The project occurs within designated *Priority Habitat of Rare Species* and therefore requires review through a direct filing with the NHESP for compliance with the MESA. The MESA is administered by the NHESP of the MA Division of Fisheries & Wildlife, and prohibits the "take" of state-protected species, which includes actions that "...harm...kill...disrupt the nesting, breeding, feeding or migratory activity...Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

For a MESA Project Review Checklist and additional information about the MESA review process, please visit our website: www.nhesp.org ("Regulatory Review" tab). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16).

www.masswildlife.org

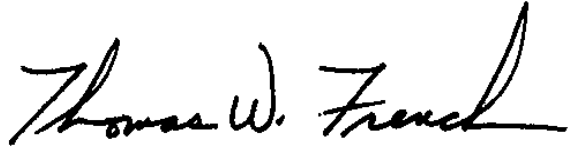
Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7891

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

No soil or vegetation disturbance, work, clearing, grading or other activities related to the subject filing may be conducted anywhere on this project site until the NHESP has completed its MESA review. If you have any questions regarding this letter please contact Amy Coman, Endangered Species Review Assistant, at (508) 389-6364.

Sincerely,

A handwritten signature in black ink that reads "Thomas W. French". The signature is written in a cursive, flowing style.

Thomas W. French, Ph.D.
Assistant Director

cc: Lisa Standley, Vanasse Hangen Brustlin, Inc.
Stewart Dalzell, Massachusetts Port Authority
MA DEP Northeast Region



Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

March 26, 2010

Stewart Dalzell
Massachusetts Port Authority
One Harborside Drive
East Boston MA 02128

RE: Project Location: Logan International Airport, Boston
Project Description: Logan Runway Safety Area Improvements Project
NHESP File No.: 07-23682

Dear Mr. Dalzell:

Thank you for submitting the required MESA fee to the Natural Heritage and Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

Based on a review of the information that was provided and the information that is currently contained in our database, the NHESP has determined that this project, as currently proposed, **will not result in a prohibited "take"** of state-listed rare species. This determination is a final decision of the Division of Fisheries & Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the NHESP pursuant to the MESA. This project may be subject to further review if no physical work is commenced within three years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Amy Coman, Endangered Species Review Assistant, at (508) 389-6364.

Sincerely,

Thomas W. French, Ph.D.
Assistant Director

cc: MA DEP Northeast Region
Boston Conservation Commission
Lisa Standley, Vanasse Hangen Brustlin, Inc.

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, North Drive, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7891

An Agency of the Department of Fish and Game



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National Marine Fisheries Service



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U.S. Department
of Transportation

**Federal Aviation
Administration**

Federal Aviation Administration
New England Region

12 New England Executive Park
Burlington, MA 01803

March 12, 2010

Mary A. Colligan
Assistant Regional Administrator for Protected Resources
U.S. Department of Commerce, NOAA
National Marine Fisheries Service, Northeast Region
55 Great Republic Drive
Gloucester MA 01930-2276

RE: Boston-Logan International Airport Runway Safety Area Improvements Project

Dear Ms. Colligan:

The Federal Aviation Administration (FAA), as the lead federal agency responsible for the Logan Runway Safety Area Improvements Project, has reviewed your letter of July 13, 2009 to The Massachusetts Port Authority (Massport) concerning potential effects to marine species protected under the Endangered Species Act. We have therefore prepared this Determination of Effects under Section 7, and request your concurrence. As documented below, we have determined that the proposed action could impact habitat potentially used by sea turtles, but would not result in an adverse effect that would jeopardize the continued existence of these species or adversely change their critical habitat.

Project Description

Massport is proposing to improve the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport (Logan Airport). The proposed improvements are part of an ongoing safety program and are required to improve the RSAs, to the extent feasible, to be consistent with the FAA's current airport design criteria¹ for RSAs and to enhance rescue access in the event of an airfield emergency. RSAs are designed to achieve the key safety goals of protecting an aircraft that runs beyond the runway end or lands short of the runway. The RSA improvements being considered are safety improvements only and do not extend runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways. In November 2005, Congress mandated that all Part 139 airport sponsors enhance passenger safety by improving their airport's RSAs by 2015 and that FAA report annually on its progress toward improving RSAs.² Part 139 airports are those that conduct commercial passenger flight operations and are required to meet rigorous FAA standards. Because of Logan's important role in the regional and national air system and the critical role of Runway 33L in Logan's operation, there is a joint FAA and Massport goal to complete these safety improvements by 2013.

1 United States Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15, December 31, 2009

2 United States Department of Transportation, Office of Inspector General, *Actions Taken and Needed to Improve FAA's Runway Safety Program*, March 3, 2009, p. 1.

The proposed project is to construct RSAs that meet FAA's standards to the maximum extent practicable. The Runway 33L proposed alternative is a 600-foot long and 300-foot wide RSA with an EMAS (Emergency Materials Arresting System) on a pile-supported deck. This area is currently bisected by the 2,400-foot long timber pile approach light pier. Emergency access ramps will be installed on either side of the RSA for access to the water's edge in the event of an overrun or undershoot. The existing light pier, constructed on wooden piles, will also be reconstructed using man-made materials (e.g. concrete, steel, aluminum) piles in the same general location. The proposed reconstruction of the light pier will reduce the number of piles compared to existing conditions.

The proposed Runway 33L RSA, on a pile-supported deck, will not contribute to additional pollutant loading. The only potential exposure to pollutants would be from an aircraft accident or infrequent access to the light pier for maintenance. These conditions currently exist and the improvements would reduce the risk of any discharge. No vehicles will access the RSA on a regular basis. Deicing liquids are not used on the EMAS or on the RSA and any small snow removal equipment would be used infrequently. To avoid water sheeting off the deck, design options that would collect any runoff and divert it to deeper water in order to mitigate any erosion on the beach below the deck will be developed. All existing measures, mandated in the current NPDES permit, will be adhered to at Runway 33L. The proposed project will be incorporated into the Airport's existing NPDES permit, the Stormwater Pollution Prevention Plan (SWPPP), the Spill Prevention, Containment, and Countermeasures Plan (SPCC), and the Operations and Maintenance Manual.

The Runway 22R proposed alternative is an inclined safety area. While the existing EMAS bed added significant benefits in aircraft arrestment, there still exists a substantial grade separation between the end of the runway and the Boston Harbor environment, which could further damage an aircraft that runs beyond the runway end and inhibit efficient and safe rescue access. The inclined safety ramp is similar to those previously installed at the end of Runways 22L and 27. Gravel fill would be placed approximately 190 feet north from the existing EMAS bed and would be graded over the full width of the extended safety area down to the mean lower low water elevation.

Impacts to Marine Resources

Six pile size and spacings alternatives are currently being evaluated for the Runway 33L RSA. A range of direct impacts was determined based on the different pile sizes. The pile size area was then multiplied by the number of piles needed for the proposed deck options. The lower end of the range is the combination smallest pile option (smallest footprint) and the longest deck span option (least number of piles). The higher end of the range is the largest pile option (largest footprint) and the shortest deck span option (highest number of piles). Based on the length of the proposed deck and the area of delineated coastal wetlands resources, we determined that 20 percent of the piles would be in the intertidal zone and 80 percent of the piles would be below mean low water.

The pile-supported deck would be constructed above approximately 27,550 square feet of intertidal areas (coastal beach) and would replace the first 600 feet of the existing timber light pier. This resource would be lost only where pilings are installed beneath the deck. Depending

on pile type and configuration, the direct impact resulting from the installation of the piles would be expected to be less than 700 square feet. The pile-supported deck would be constructed above approximately 95,530 square feet submerged tidelands (below mean low water), however this resource would only be lost where pilings are installed beneath the deck. The direct impact resulting from the installation of the piles would be expected to be less than 3,000 square feet depending on pile size and configurations. Approximately 55,420 square feet of eelgrass exist within the footprint of the pile-supported deck. This entire area of eelgrass is assumed to be lost or altered due to shading even though some eelgrass at the edge of the deck would still receive sunlight penetration for parts of the day.

The Runway 33L proposed safety improvements are likely to result in some changes to coastal processes. Coastal processes include wave action, tidal circulation, erosion, and sedimentation. Assuming there is transport of sediment past the site currently, sedimentation may increase slightly beneath the pile-supported structure due to the slight reduction in speed of the currents due to the presence of the piles. Similar to conditions around the existing light pier, a small amount of erosion of the harbor bottom may occur around the piles. Changes to coastal processes beneath and in the vicinity of the pile-supported deck could result in indirect impacts to coastal resources and to benthic organisms, including eelgrass. However, habitat for shellfish would continue to be available as filter feeders and detritivores would not likely be significantly affected. Modeling to determine the full extent of impacts to coastal processes and associated coastal resources is ongoing and will be described in the Draft EA/EIR.

Runway 22R RSA construction would result in the loss of approximately 27,930 square feet of salt marsh and 35,360 square feet of intertidal coastal beach and tidal flat. Approximately 4,700 square feet of submerged tidelands would be lost due to the placement of fill required to construct the inclined safety area and match grades to MLLW..

Affected Federal Species

The NMFS comment letter states that four species of federally threatened or endangered sea turtles and five species of federally endangered whales may be found seasonally in Massachusetts waters. These include:

- Federally endangered Kemp's ridley (*Lepidochelys kempi*) – typically present in Massachusetts waters from June through November.
- Federally threatened loggerhead (*Caretta caretta*) – typically present in Massachusetts waters from June through November.
- Federally endangered leatherback (*Dermochelys coriacea*) – located in New England waters during the warmer months.
- Federally endangered green sea turtles (*Chelonia mydas*) – occurs sporadically in New England waters, but any occurrence in Massachusetts waters is likely to be rare.
- Federally endangered North Atlantic right whales (*Eubalaena glacialis*) – documented in the nearshore waters of Massachusetts from December through June (in April 1996 one individual was documented in Boston Harbor).
- Federally endangered humpback whales (*Megaptera novaeangliae*) – feed during the spring, summer, and fall over a range that includes Massachusetts Bay (in the fall of 2000, one individual was documented in Boston Harbor).

- Federally endangered fin (*Balaenoptera physalus*), Sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales are typically found in deeper offshore waters and are not likely to occur in Boston Harbor.

In addition, the letter states that although whales are not considered residents of the Boston Harbor area, transients occasionally enter the area as they complete seasonal migrations in nearby Massachusetts Bay. However, based on the available information, and the near shore location of the proposed project, listed whales are likely to be rare within the project area. In contrast, sea turtles are known to occur on Stellwagen Bank and in Massachusetts Bay and while no surveys for sea turtles have been conducted in Boston Harbor, suitable forage and habitat exists in this area. NMFS concluded that it is likely that sea turtles occasionally are present in Boston Harbor. Table 1 provides a summary of sea turtle habitat/diet requirements and list potential suitable habitat within the project area.

Table 1. Summary of Turtle Habitat and Diet Requirements

Sea Turtles	Habitat ¹	Suitable Habitat found within the Project Site/ Boston Harbor (Yes/No)
Kemp's Ridley	Adult Kemp's primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found. Their diet consists mainly of swimming crabs, but may also include fish, jellyfish, and an array of mollusks.	Yes (e.g., jellyfish, crabs, mollusks)
Loggerhead	Loggerheads occupy three different ecosystems during their lives--the terrestrial zone, the oceanic zone, and the "neritic" zone. Adults are omnivorous, foraging into shallow or coastal areas, for plants like eelgrass, sponges, mollusks and urchins.	Yes (e.g., eelgrass, mollusks)
Leatherback	Commonly known as pelagic animals, but also forage in coastal waters. After nesting, female leatherbacks migrate from tropical waters to more temperate latitudes, which support high densities of jellyfish prey in the summer.	Yes (e.g., jellyfish)
Green Sea Turtle	Green turtles primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and travel to nearshore foraging grounds. Once they move to these nearshore benthic habitats, adult green turtles are almost exclusively herbivores, feeding on sea grasses and algae.	Yes (e.g., eelgrass)

Source: National Marine Fisheries Service, Office of Protected Resources: Marine Turtles. Website: <http://www.nmfs.noaa.gov/pr/species/turtles/>

Boston Harbor has the potential to provide suitable habitat for the four sea turtles that may be found in Massachusetts waters. The project area provides habitat only in the area of the eelgrass bed, and the proposed safety project would result in the loss of approximately

1.3 acres of this habitat. The remaining >50 acres of this eelgrass bed would be unaffected by the proposed project.

The project area does not provide habitat for whales. In addition to being too shallow, the Runway 33L impact area is currently bisected by the timber light pier, which would obstruct any whale movements.

Finding

The proposed runway safety improvement project area does not include any designated Critical Habitat for sea turtles or marine mammals. As discussed above, the project would not affect habitat used by whale species.

The proposed safety project would result in the loss of a small area (1.3 acres) of habitat potentially used by vagrant sea turtles. The project site may provide suitable habitat/food (e.g., eel grass, jellyfish, invertebrates, mollusks, and crabs). There would be no impacts to water quality or habitat quality. As noted by NHFS of all these species, occurrence of green turtles in Massachusetts waters is likely to be rare, although the stranding/cold-stunned numbers in Cape Cod has been increasing in recent years. The water temperature in the Boston Harbor during most of the year (fall, winter, and spring months) is below 50 °F, which are not favored by sea turtles and would caused them to be cold-stunned; however documented strandings/cold-stunned sea turtles within the Boston Harbor are extremely rare. Therefore it is very rare or unlikely that any of the sea turtles species may be using the project area. Sea turtles are more likely to be found within Boston Harbor after being cold-stunned and washed into the Harbor by currents. They are more likely to be found in other areas such as Cape Cod Bay, where most of the sightings/stranding occur.

For these reasons, we conclude that the proposed runway safety areas at Runway 33L and Runway 22R would not affect Critical Habitat or jeopardize the continued existence of these species. We look forward to your concurrence with this Finding.

If you have any questions or require additional information, please contact me at 718-238-7613.

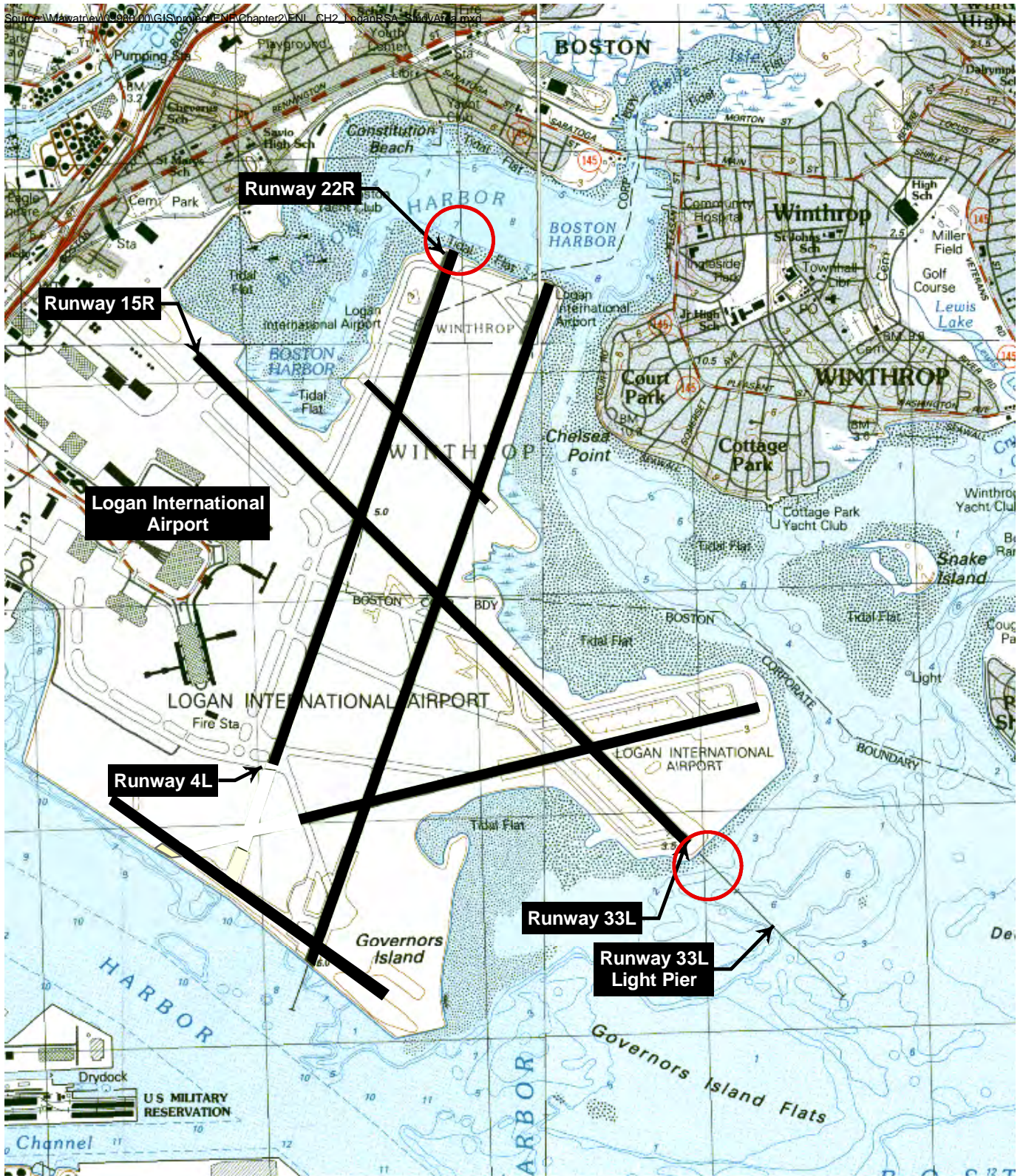


Richard Doucette
Environmental Program Manager
FAA New England Region


Enclosures

- Project Area Map
- Runway 22R Wetland Impact Areas Map
- Runway 33L Wetland Impact Areas Map
- VHB Memorandum, Habitat Assessment for Sea Turtles and Whales

Cc: Stewart Dalzell, Massport
Danielle Palmer, NMFS



Legend

 RSA Improvement Study Area



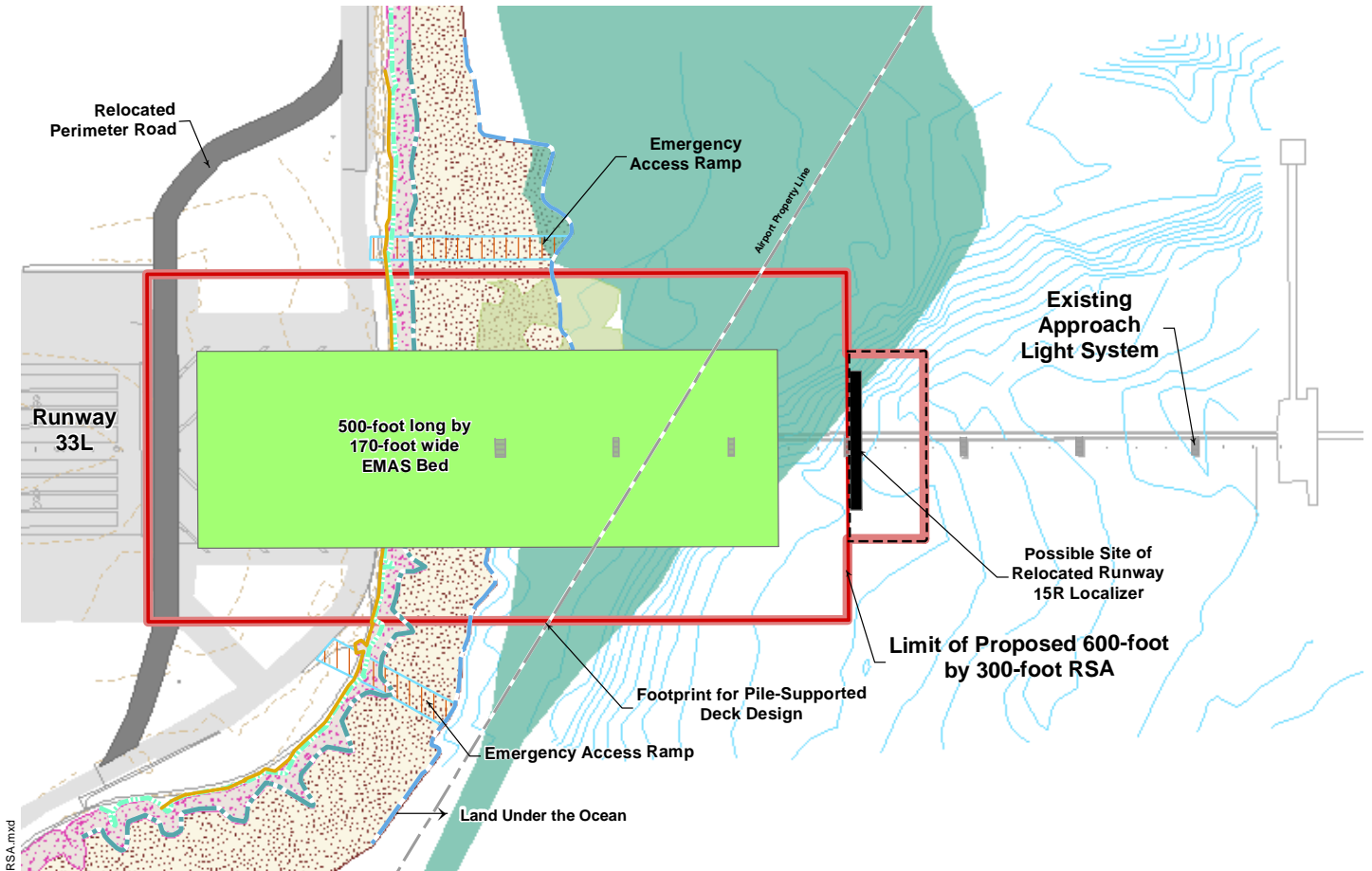

0 625 1,250 2,500 Feet



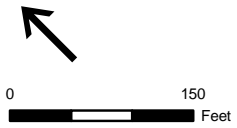
Logan RSA

Figure 1
USGS Site Location Map of RSA Improvements

Data Sources:
USGS DRG (1987) - MassGIS



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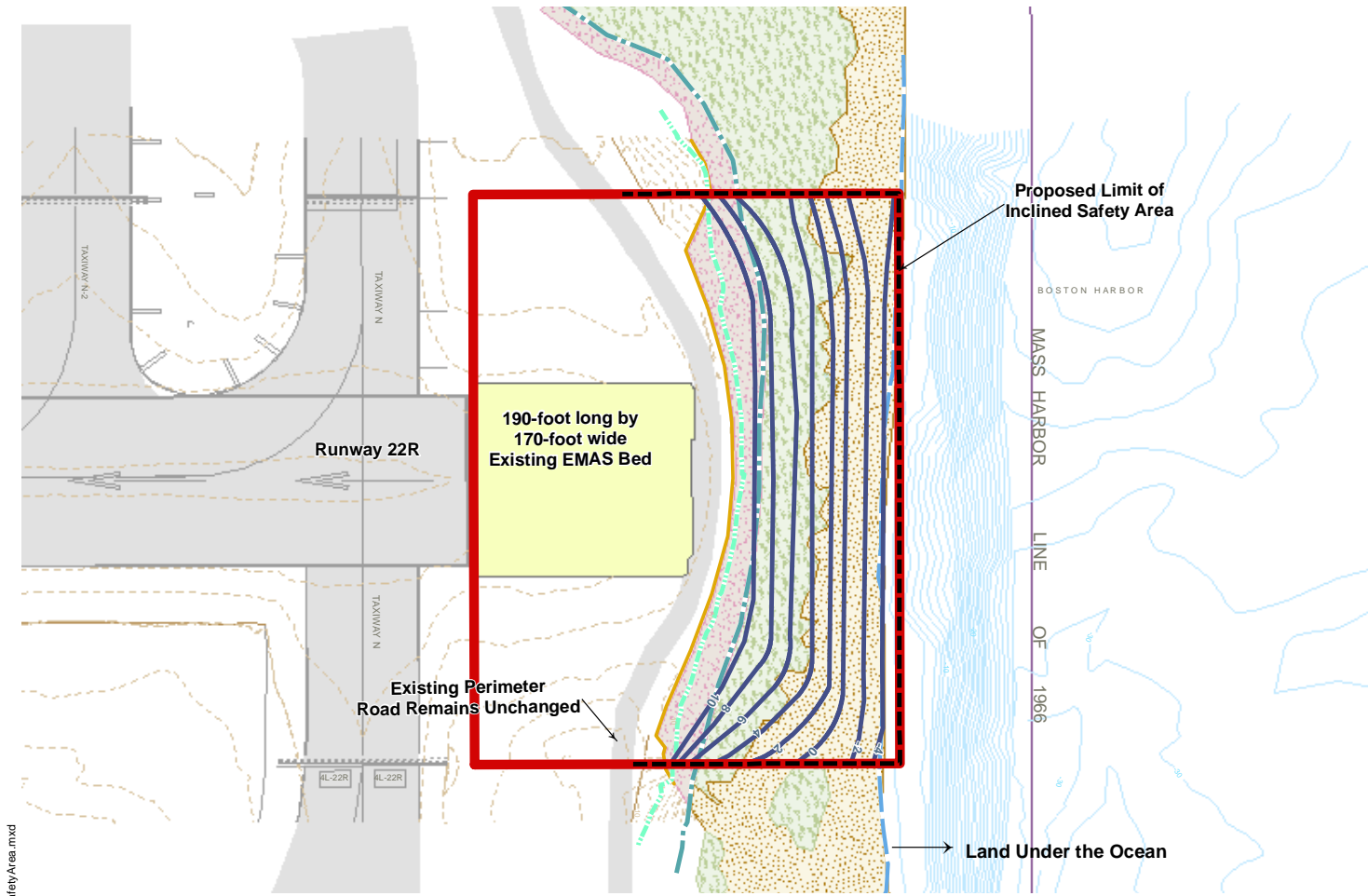


- Legend**
- New EMAS Bed
 - Footprint for Pile-Supported Deck
 - RSA Footprint
 - Emergency Ramps
 - Pile-Supported Deck for Localizer
 - Existing Contour
 - Existing Bathymetric Contour
 - Mean High Water (4.58')
 - Mean Low Water (-4.51')
 - Top of Coastal Bank
 - Limit of Land Subject to Coastal Storm Flows
 - Mussel Bed
 - Limit of Eelgrass
 - Coastal Bank
 - Coastal Beach

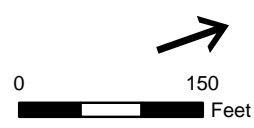


Logan RSA

Figure 4
Runway 33L Proposed RSA



\\massport\009980\000\GIS\project\NOI_RSA\Runway22R_inclinedSafetyArea.mxd



Legend

- Existing EMAS Bed
- RSA Footprint
- Limit of Inclined Safety Area
- Proposed Contour
- Coastal Bank
- Coastal Beach
- Salt Marsh
- Existing Contour
- Existing Bathymetric Contour
- Mean High Water (4.58')
- Mean Low Water (-4.51')
- Top of Coastal Bank
- Limit of Land Subject to Coastal Storm Flowage



Logan RSA

Figure 5
Runway 22R Proposed RSA

Source: Jacobs Edwards & Kelcey, Inc.
Childs Engineering Corps.
Massport - Bathymetric Contours



Vanasse Hangen Brustlin, Inc.

101 Walnut Street
P. O. Box 9151
Watertown, MA 02471-9151
617 924 1770
FAX 617 924 2286

Memorandum

To: Lisa Standley, VHB

Date: February 12, 2010

Project No.: 0998000

From: Carolina Vasconcelos Linder, VHB

Re: Assessment of sea turtles and whale
presence within the Boston Harbor

This memorandum includes an introduction with a summary of the NOAA's National Marine Fisheries Service (NMFS) comment letter, a summary of the habitat requirements for four sea turtles, and a description of surveys conducted within the project site. It also includes results from stranding data of sea turtles conducted in Massachusetts. The last section includes a discussion/analysis and conclusion based on the information presented.

Introduction and Background

On July 13, 2009, NMFS submitted a comment letter to the Massachusetts Port Authority (Massport) with information on the presence of federally threatened, endangered, and special concern species that may be present in the project area. The letter states that four species of federally threatened or endangered sea turtles and five species of federally endangered whales may be found seasonally in Massachusetts waters. These include:

- Federally endangered Kemp's ridley (*Lepidochelys kempii*) – typically present in Massachusetts waters from June through November.
- Federally threatened loggerhead (*Caretta caretta*) – typically present in Massachusetts waters from June through November.
- Federally endangered leatherback (*Dermochelys coriacea*) – located in New England waters during the warmer months.
- Federally endangered green sea turtles (*Chelonia mydas*) – occurs sporadically in New England waters, but any occurrence in Massachusetts waters is likely to be rare.
- Federally endangered North Atlantic right whales (*Eubalaena glacialis*) – documented in the nearshore waters of Massachusetts from December through June (in April 1996 one individual was documented in Boston Harbor).
- Federally endangered humpback whales (*Megaptera novaengliae*) – feed during the spring, summer, and fall over a range that includes Massachusetts Bay (in the fall of 2000, one individual was documented in Boston Harbor).
- Federally endangered fin (*Balaenoptera physalus*), Sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales are typically found in deeper offshore waters and are not likely to occur in Boston Harbor.

In addition, the letter states that although whales are not considered residents of the Boston Harbor area, transients occasionally enter the area as they complete seasonal migrations in nearby Massachusetts Bay. However, based on the available information, and the near shore location of the proposed project, listed whales are likely to be rare within the project area. In contrast, sea turtles are known to occur on Stellwagen Bank and in Massachusetts Bay and while no surveys for sea turtles have been conducted in Boston Harbor, suitable forage and habitat exists in this area. NMFS concluded that it is likely that sea turtles occasionally are present in Boston Harbor and therefore, may occasionally be present in the project area and that consultation, pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, may be necessary.

Sea Turtles

Of the four sea turtles species that have documented presence in Massachusetts waters, only the leatherback, is considered to be cold adapted. The other sea turtle species are tropical/sub-tropical creatures and use Massachusetts waters (e.g., Stellwagen Bank National Marine Sanctuary, Cape Cod Bay, Nantucket sound) during the short season of late summer. They visit sporadically with warm water episodes or are juveniles, lost from wandering or tossed by storms. On Stellwagen Bank and the surrounding coasts, there has been considerable interest in sea turtles, especially in fall when cold stunned individuals may wash ashore.¹

The Massachusetts Audubon Society (MAS) in Wellfleet has accumulated years of data on sea turtles within the Cape Cod Bay and surrounding beaches. Their data show that there is extensive usage of Massachusetts waters by sea turtles. Attached is the 1979 -2008 stranding data from MAS. Most of the sightings and cold-stunned/strandings of sea turtles occur in the Cape Cod beaches/Cape Cod Bay. The greatest numbers of cold-stunned strandings are from Kemp's ridley turtles, which travel with the Gulf current to the Cape Cod area to feed on crabs and before returning south in the Fall they are caught in cold waters (approximately 50 °F) and become cold stunned.²

In Fall 2009 several stranded and cold-stunned sea turtles was found and rescued in Cape Cod.^{3,4} In December of 2010 three dead/stranded Kemp's ridley were found in Boston Harbor (Weymouth, Hull, and Quincy), likely washed in the Harbor by the currents.⁵ However, Bob Prescott from Mass Audubon believes sea turtles uses the Boston Harbor and stated that in 2009 there was one sighting of a Kemp's ridley in Hull.

- 1 The Provincetown Center for Coastal Studies, Our Environment: Stellwagen Bank National Marine Sanctuary – Sea Turtles. Website: <http://www.coastalstudies.org/what-we-do/stellwagen-bank/turtles.htm>
- 2 The Massachusetts Audubon, Wellfleet Bay – Natural History: Sea Turtles on Cape Cod. Website: http://www.massaudubon.org/Nature_Connection/Sanctuaries/Wellfleet/seaturtles.php
- 3 Kathy Zagzebski, National Marine Life Center. December 14, 2009 article: Turtles and now dolphins highlight the need for the National Marine Life Center. Stranded sea turtles rescued on Cape Cod. Website: <http://nmlc.org/2009/12/turtles-and-now-dolphins-highlight-the-need-for-the-national-marine-life-center/>
- 4 Michaela Stanelun, Globe Correspondent. December 7, 2009 article: Stranded sea turtles rescued on Cape Cod. Website: http://www.boston.com/news/local/breaking_news/2009/12/stranded_sea_tu_1.html
- 5 Constance Lindner, Globe Correspondent. January 3, 2010 article: Warm fall may have misled turtles. Website: http://www.boston.com/news/science/articles/2010/01/03/warm_fall_may_have_misled_sea_turtles_into_lingering/

Table 1. Summary of Habitat and Diet Requirements

Sea Turtles	Habitat ¹	Suitable Habitat found within the Project Site/ Boston Harbor (Yes/No)
Kemp's Ridley	Adult Kemp's primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found. Their diet consists mainly of swimming crabs, but may also include fish, jellyfish, and an array of mollusks.	Yes (e.g., jellyfish, crabs, mollusks)
Loggerhead	Loggerheads occupy three different ecosystems during their lives--the terrestrial zone, the oceanic zone, and the "neritic" zone. Adults are omnivorous, foraging into shallow or coastal areas, for plants like eelgrass, sponges, mollusks and urchins.	Yes (e.g., eelgrass, mollusks)
Leatherback	Commonly known as pelagic animals, but also forage in coastal waters. After nesting, female leatherbacks migrate from tropical waters to more temperate latitudes, which support high densities of jellyfish prey in the summer.	Yes (e.g., jellyfish)
Green Sea Turtle	Green turtles primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and travel to nearshore foraging grounds. Once they move to these nearshore benthic habitats, adult green turtles are almost exclusively herbivores, feeding on sea grasses and algae.	Yes (e.g., eelgrass)

Source: National Marine Fisheries Service, Office of Protected Resources: Marine Turtles. Website: <http://www.nmfs.noaa.gov/pr/species/turtles/>

Habitat within the Project Area vs. Sea Turtle Habitat Requirements

Table 1 provides a summary of sea turtle habitat/diet requirements and list potential suitable habitat within the project area. Project area includes both the impacted area where field investigations were conducted (end of Runways 22R and 33L), and the overall Boston Harbor (assuming that organisms found within the proposed area are also likely to be found within the Harbor).

The following section describes the results of surveys conducted within the project site. Several of the organisms (e.g., jellyfish, mollusks, crabs, and eelgrass) found within these surveys constitute potential food source for sea turtles (Table 1). For example, mollusks include species such as clams, mussels, snail, squids, chitons, and worm like animals. Most of these organisms have been found during the shellfish and benthic surveys conducted within the project area.

Salt Marsh and Shellfish Habitat

Clams and snails are mollusk organisms that are potential food sources for sea turtles species such as Kemp's ridley and loggerheads. On April 8, June 5 and June 6, 2008, field investigations were conducted to delineate wetlands off the end of Runway 22R and survey shellfish on the intertidal flats and beach off Runway 22R and 33L. Vegetated wetlands (salt marsh) are present off the end of Runway 22R within the Runway 22R Study Area. No vegetated wetlands are present off the end of Runway 33L. During the field investigation, the following were observed colonizing or living within the salt marsh: periwinkles (*Littorina littorea*), ribbed mussels (*Geukensia demissa*), mud snails (*Ilyanassa obsoleta*), green crabs (*Carcinus maenus*), and hermit crabs (*Pagurus* sp.). Other organisms found during these surveys included jellyfish (e.g., moon jelly), a potential food source for the leatherback sea turtle, and crabs which are also another food source for Kemp's ridley sea turtles.

These shellfish and other sea turtles food sources are likely to be found in another area of the Boston Harbor and even in more quantities in areas such Cape Cod Bay (where most of the sightings/stranding occur). In addition, the water temperature in the Boston Harbor during most of the year (fall, winter, and spring months) is below 50 °F, which are not favored by sea turtles and would caused them to be cold-stunned.

Within the project area (within both the Runway 22R and Runway 33L Study Areas) soft shell clams (*Mya arenaria*) were found to be present but in very low densities. Blue mussels (*Mytilus edulis*) were found in high densities in several areas off Runway 33L. A large and densely populated mussel bed is located on the tidal flat within the Runway 33L Study Area and additional mussel resources are above the beach and tidal flat area interspersed within the rocky beach slope. Tables 2, 3 and 4 list the shellfish species observed in the Runway 22R and Runway 33L Study Areas (population densities of the ribbed mussels were not assessed since the mussels occur in low numbers and are not a species that is recreationally or commercially important).

Densities of soft shell clams in the Runway 22R Study Area are estimated at 28 per square meter. Substantial numbers of dead soft shell clam shells were also observed throughout the Runway 22R Study Area. Given the low density of living soft shell clams and the large number of dead shells observed in the Runway 22R Study Area, it appears that an event in the past may have caused widespread mortality of the population in this area, particularly in the vicinity of Runway 22R Shellfish Quadrats 1, 2, and 3. The habitat otherwise appears to be healthy with scyphozoans, polychaetes, gastropods, crustaceans and fish present in the Study Area and waters offshore. A small number of live soft shell clams were collected in the beach and tidal areas within the Runway 33L Study Area.

The mussel bed present on the tidal flat east of the Runway 33L light pier consists of a dense but patchy bed of live blue mussels (*Mytilus edulis*) attached to a substrate of dead shell and trapped mud which is raised above the tidal flat. Mussels occur at a density of 420 per square meter in this area. Mussels were also found interspersed in the rocky intertidal zone above the tidal flat within the cobble and rock beach. Mussels occur at a density of 200 per square meter in the rocky intertidal zone west of the Runway 33L light pier.

Eel Grass Habitat

Eel grasses are potential food sources for sea turtles species such as loggerheads and greens. On October 15, 2007 an eelgrass (*Zostera marina*) survey conducted in Boston Harbor off the end of Runway 33 indicated that an eelgrass bed is located at the end of Runway 33L and covers an area of approximately 54 acres. The eelgrass bed is primarily located on the eastern side of the Runway 33L light pier, however, it also extends to the western side of the light pier. In April 2008, additional surveys were conducted where the edge of the eelgrass bed delineated at Runway 33L. Based on the eelgrass survey, the density of eelgrass is greatest in the area near the shoreline (61 to 100 percent) and further off shore (21 to 60 percent) to the east of the Runway 33L light pier. There is no eelgrass present at Runway 22R. Eel grass potential food sources for sea turtles species such as Kemp's ridley and loggerheads.

Eelgrass is the most common seagrass present on the Massachusetts coastline. The MassDEP Eelgrass layer, produced from data collected in 2001, is the second statewide mapping of the eelgrass resources along the coast. The interactive map within the MassDep website shows that there are several areas of eel grass within the Massachusetts coast (e.g., Boston Harbor, Salem Sound, Cape Ann, South Coast, Plymouth Harbor, Cape Cod Bay, Pleasant Bay, Buzzard's Bay, Elizabeth Islands, Martha's Vineyard, and Nantucket coastline)⁶. Therefore, sea turtles that feed on eel grass are more likely to be found in other areas such Cape Cod Bay (where most of the sightings/stranding occur). In addition, the number of sightings/cold-stunned green sea turtles is very small every year. Likewise, the water temperature in the Boston Harbor during most of the year (fall, winter, and spring months) is below 50 °F, which are not favored by sea turtles and would caused them to be cold-stunned.

⁶ Massachusetts Department of Environmental Protection: Water Resources & Wetlands - Eelgrass Interactive Map. Website: <http://www.mass.gov/dep/water/resources/maps/eelgrass/eelgrass.htm>

Benthic Habitat

Benthic organisms, such as invertebrates and worm-like species, represents potential food sources for many species including sea turtles species.

On August 29, 2007, benthic analysis of the Runway 33L Study Area revealed a relatively diverse community with a variety of benthic organisms that are typical of Boston Harbor communities. No unusual or unique species were identified. Overall, there were 44 different species identified at all four analyzed samples. These species included 1 oligochaete worm, 16 polychaete worms, 12 crustaceans (mostly amphipods), 5 gastropods, 5 bivalves, and 5 miscellaneous species that included hydroids, bryozoans, ascideans, and a nematode worm. The characteristics of the benthic community and the species found in the benthic samples indicate the Runway 33L RSA study area provides good habitat for higher level organisms including fish and crabs by offering rearing and feeding (e.g., sea turtles) opportunities.

Water Quality

Water quality is important for the existence of several organisms that constitute potential food sources for sea turtles. Surveys of water quality (water samples and vibracore samples) were conducted within the project site. The results showed that water quality is typical of near-shore Boston Harbor locations. The turbidity levels ranged from 0.68 to 0.95 ntu at the end of Runway 33L while there were slightly higher levels of turbidity recorded at the Runway 22R ranging from 2.73 to 3.35 ntu. The pH levels were steady at 8.0 to 8.1 for all samples and the secchi disk depth ranged from 9.4 to 11.0 feet for the samples collected.

Whales

It is very rare or unlikely that any of the whales may be using the project site, including the right whales and humpback whales that were once documented within the Boston Harbor. As noted by NMSF none of these whale species are considered residents of the Boston Harbor and only occasionally transients may enter the Harbor as they complete seasonal migration in nearby Massachusetts Bay. The proposed work at the Runway 22R end extends only to the low water mark, and therefore affects an area too shallow to be used by whales. The proposed work area at the Runway 33L end is bisected by the existing timber light pier. The work area extends to 19 feet below mean sea level. This area is unlikely to be used by whales due to the shallow depth and the obstruction provided by the existing light pier.

Summary

Boston Harbor has the potential to provide suitable habitat for all the four sea turtles that may be found in Massachusetts waters. As noted by NMFS of all these species, occurrence of green turtles in Massachusetts waters is likely to be rare, although the stranding/cold-stunned numbers in Cape Cod has been increasing in recent years. The project site may provide suitable habitat/food (e.g., eel grass, jellyfish, invertebrates, mollusks, and crabs), for all these turtle species. However, the project will potentially impact a very small suitable habitat area (e.g., eel grass, shellfish, and benthic habitat) in comparison to other larger areas of suitable habitat that may also be found in other sites within the Boston Harbor and within the Massachusetts Bay/Cape Cod Bay/ Stellwagen Bank National Marine Sanctuary. The water temperature in the Boston Harbor during most of the year (fall, winter, and spring months) is below 50 °F, which are not favored by sea turtles and would cause them to be cold-stunned; however there has been no documented strandings/cold-stunned sea turtles within the Boston Harbor (with the exception of December 2010). Therefore it is very rare or unlikely that any of the sea turtles species may be using the project area. Within the Project area, the eel grass bed in combination with the shellfish bed at end of Runway 33L has the more likely potential to offer sea turtles feeding habitat. Sea turtles are more likely to be found within the Boston Harbor after being cold-stunned and washed into the Harbor by currents. They are more likely to be found in other areas such as Cape Cod Bay, where most of the sightings/strandings occur.



U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
New England Region

12 New England Executive Park
Burlington, MA 01803

March 22, 2010

Mary A. Colligan
Assistant Regional Administrator for Protected Resources
U.S. Department of Commerce, NOAA
National Marine Fisheries Service, Northeast Region
55 Great Republic Drive
Gloucester MA 01930-2276

RE: Boston-Logan International Airport Runway Safety Area Improvements Project

Dear Ms. Colligan:

The Federal Aviation Administration (FAA), as the lead federal agency responsible for the Logan Runway Safety Area Improvements Project, has reviewed your letter of July 13, 2009 to The Massachusetts Port Authority (Massport) concerning potential effects to marine species protected under the Endangered Species Act. We have therefore prepared this Determination of Effects under Section 7, and request your concurrence. As documented below, we have determined that the proposed action could impact habitat potentially used by sea turtles, but would not result in an adverse effect that would jeopardize the continued existence of these species or adversely change their critical habitat.

Project Description

Massport is proposing to improve the runway safety areas (RSAs) at the ends of Runway 33L and Runway 22R at Boston-Logan International Airport (Logan Airport). The proposed improvements are part of an ongoing safety program and are required to improve the RSAs, to the extent feasible, to be consistent with the FAA's current airport design criteria¹ for RSAs and to enhance rescue access in the event of an airfield emergency. RSAs are designed to achieve the key safety goals of protecting an aircraft that runs beyond the runway end or lands short of the runway. The RSA improvements being considered are safety improvements only and do not extend runways or have any effect on normal runway operations, runway capacity, or types of aircraft that can use the runways. In November 2005, Congress mandated that all Part 139 airport sponsors enhance passenger safety by improving their airport's RSAs by 2015 and that FAA report annually on its progress toward improving RSAs.² Part 139 airports are those that conduct commercial passenger flight operations and are required to meet rigorous FAA standards. Because of Logan's important role in the regional and national air system and the critical role of Runway 33L in Logan's operation, there is a joint FAA and Massport goal to complete these safety improvements by 2013.

The proposed project is to construct RSAs that meet FAA's standards to the maximum extent practicable. The Runway 33L proposed alternative is a 600-foot long and 300-foot wide RSA

1 United States Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15, December 31, 2009

2 United States Department of Transportation, Office of Inspector General, *Actions Taken and Needed to Improve FAA's Runway Safety Program*, March 3, 2009, p. 1.

with an EMAS (Emergency Materials Arresting System) on a pile-supported deck. This area is currently bisected by the 2,400-foot long timber pile approach light pier. Emergency access ramps will be installed on either side of the RSA for access to the water's edge in the event of an overrun or undershoot. The existing light pier, constructed on wooden piles, will also be reconstructed using man-made materials (e.g. concrete, steel, aluminum) piles in the same general location. The proposed reconstruction of the light pier will reduce the number of piles compared to existing conditions.

The proposed Runway 33L RSA, on a pile-supported deck, will not contribute to additional pollutant loading. The only potential exposure to pollutants would be from an aircraft accident or infrequent access to the light pier for maintenance. These conditions currently exist and the improvements would reduce the risk of any discharge. No vehicles will access the RSA on a regular basis. Deicing liquids are not used on the EMAS or on the RSA and any small snow removal equipment would be used infrequently. To avoid water sheeting off the deck, design options that would collect any runoff and divert it to deeper water in order to mitigate any erosion on the beach below the deck will be developed. All existing measures, mandated in the current NPDES permit, will be adhered to at Runway 33L. The proposed project will be incorporated into the Airport's existing NPDES permit, the Stormwater Pollution Prevention Plan (SWPPP), the Spill Prevention, Containment, and Countermeasures Plan (SPCC), and the Operations and Maintenance Manual.

The Runway 22R proposed alternative is an inclined safety area. While the existing EMAS bed added significant benefits in aircraft arrestment, there still exists a substantial grade separation between the end of the runway and the Boston Harbor environment, which could further damage an aircraft that runs beyond the runway end and inhibit efficient and safe rescue access. The inclined safety ramp is similar to those previously installed at the end of Runways 22L and 27. Gravel fill would be placed approximately 190 feet north from the existing EMAS bed and would be graded over the full width of the extended safety area down to the mean lower low water elevation.

Impacts to Marine Resources

Six pile size and spacings alternatives are currently being evaluated for the Runway 33L RSA. A range of direct impacts was determined based on the different pile sizes. The pile size area was then multiplied by the number of piles needed for the proposed deck options. The lower end of the range is the combination smallest pile option (smallest footprint) and the longest deck span option (least number of piles). The higher end of the range is the largest pile option (largest footprint) and the shortest deck span option (highest number of piles). Based on the length of the proposed deck and the area of delineated coastal wetlands resources, we determined that 20 percent of the piles would be in the intertidal zone and 80 percent of the piles would be below mean low water.

The pile-supported deck would be constructed above approximately 27,550 square feet of intertidal areas (coastal beach) and would replace the first 600 feet of the existing timber light pier. This resource would be lost only where pilings are installed beneath the deck. Depending on pile type and configuration, the direct impact resulting from the installation of the piles would be expected to be less than 700 square feet. The pile-supported deck would be

constructed above approximately 95,530 square feet submerged tidelands (below mean low water), however this resource would only be lost where pilings are installed beneath the deck. The direct impact resulting from the installation of the piles would be expected to be less than 3,000 square feet depending on pile size and configurations. Approximately 55,420 square feet of eelgrass exist within the footprint of the pile-supported deck. This entire area of eelgrass is assumed to be lost or altered due to shading even though some eelgrass at the edge of the deck would still receive sunlight penetration for parts of the day.

The Runway 33L proposed safety improvements are likely to result in some changes to coastal processes. Coastal processes include wave action, tidal circulation, erosion, and sedimentation. Assuming there is transport of sediment past the site currently, sedimentation may increase slightly beneath the pile-supported structure due to the slight reduction in speed of the currents due to the presence of the piles. Similar to conditions around the existing light pier, a small amount of erosion of the harbor bottom may occur around the piles. Changes to coastal processes beneath and in the vicinity of the pile-supported deck could result in indirect impacts to coastal resources and to benthic organisms, including eelgrass. However, habitat for shellfish would continue to be available as filter feeders and detritivores would not likely be significantly affected. Modeling to determine the full extent of impacts to coastal processes and associated coastal resources is ongoing and will be described in the Draft EA/EIR.

Runway 22R RSA construction would result in the loss of approximately 27,930 square feet of salt marsh and 35,360 square feet of intertidal coastal beach and tidal flat. Approximately 4,700 square feet of submerged tidelands would be lost due to the placement of fill required to construct the inclined safety area and match grades to MLLW.

Affected Federal Species

The NMFS comment letter states that four species of federally threatened or endangered sea turtles and five species of federally endangered whales may be found seasonally in Massachusetts waters. These include:

- Federally endangered Kemp's ridley (*Lepidochelys kempi*) – typically present in Massachusetts waters from June through November.
- Federally threatened loggerhead (*Caretta caretta*) – typically present in Massachusetts waters from June through November.
- Federally endangered leatherback (*Dermochelys coriacea*) – located in New England waters during the warmer months.
- Federally endangered green sea turtles (*Chelonia mydas*) – occurs sporadically in New England waters, but any occurrence in Massachusetts waters is likely to be rare.
- Federally endangered North Atlantic right whales (*Eubalaena glacialis*) – documented in the nearshore waters of Massachusetts from December through June (in April 1996 one individual was documented in Boston Harbor).
- Federally endangered humpback whales (*Megaptera novaeangliae*) – feed during the spring, summer, and fall over a range that includes Massachusetts Bay (in the fall of 2000, one individual was documented in Boston Harbor).
- Federally endangered fin (*Balaenoptera physalus*), Sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales are typically found in deeper offshore waters and are not likely to occur in Boston Harbor.

In addition, the letter states that although whales are not considered residents of the Boston Harbor area, transients occasionally enter the area as they complete seasonal migrations in nearby Massachusetts Bay. However, based on the available information, and the near shore location of the proposed project, listed whales are likely to be rare within the project area. In contrast, sea turtles are known to occur on Stellwagen Bank and in Massachusetts Bay and while no surveys for sea turtles have been conducted in Boston Harbor, suitable forage and habitat exists in this area. NMFS concluded that it is likely that sea turtles occasionally are present in Boston Harbor. Table 1 provides a summary of sea turtle habitat/diet requirements and list potential suitable habitat within the project area.

Table 1. Summary of Turtle Habitat and Diet Requirements

Sea Turtles	Habitat¹	Suitable Habitat found within the Project Site/ Boston Harbor (Yes/No)
Kemp's Ridley	Adult Kemp's primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found. Their diet consists mainly of swimming crabs, but may also include fish, jellyfish, and an array of mollusks.	Yes (e.g., jellyfish, crabs, mollusks)
Loggerhead	Loggerheads occupy three different ecosystems during their lives--the terrestrial zone, the oceanic zone, and the "neritic" zone. Adults are omnivorous, foraging into shallow or coastal areas, for plants like eelgrass, sponges, mollusks and urchins.	Yes (e.g., eelgrass, mollusks)
Leatherback	Commonly known as pelagic animals, but also forage in coastal waters. After nesting, female leatherbacks migrate from tropical waters to more temperate latitudes, which support high densities of jellyfish prey in the summer.	Yes (e.g., jellyfish)
Green Sea Turtle	Green turtles primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and travel to nearshore foraging grounds. Once they move to these nearshore benthic habitats, adult green turtles are almost exclusively herbivores, feeding on sea grasses and algae.	Yes (e.g., eelgrass)

Source: National Marine Fisheries Service, Office of Protected Resources: Marine Turtles. Website: <http://www.nmfs.noaa.gov/pr/species/turtles/>

Boston Harbor has the potential to provide suitable habitat for the four sea turtles that may be found in Massachusetts waters. The project area provides habitat only in the area of the eelgrass bed, and the proposed safety project would result in the loss of approximately 1.3 acres of this habitat. The remaining >50 acres of this eelgrass bed would be unaffected by the proposed project.

The project area does not provide habitat for whales. In addition to being too shallow, the Runway 33L impact area is currently bisected by the timber light pier, which would obstruct any whale movements.

Finding

The proposed runway safety improvement project area does not include any designated Critical Habitat for sea turtles or marine mammals. As discussed above, the project would not affect habitat used by whale species.

The proposed safety project would result in the loss of a small area (1.3 acres) of habitat potentially used by vagrant sea turtles. The project site may provide suitable habitat/food (e.g., eel grass, jellyfish, invertebrates, mollusks, and crabs). There would be no impacts to water quality or habitat quality. As noted by NHFS of all these species, occurrence of green turtles in Massachusetts waters is likely to be rare, although the stranding/cold-stunned numbers in Cape Cod has been increasing in recent years. The water temperature in the Boston Harbor during most of the year (fall, winter, and spring months) is below 50 °F, which are not favored by sea turtles and would caused them to be cold-stunned; however documented strandings/cold-stunned sea turtles within the Boston Harbor are extremely rare. Therefore it is very rare or unlikely that any of the sea turtles species may be using the project area. Sea turtles are more likely to be found within Boston Harbor after being cold-stunned and washed into the Harbor by currents. They are more likely to be found in other areas such Cape Cod Bay, where most of the sightings/stranding occur.

For these reasons, we conclude that the proposed runway safety areas at Runway 33L and Runway 22R would not likely adversely affect Critical Habitat or jeopardize the continued existence of these species. We look forward to your concurrence with this Finding.

If you have any questions or require additional information, please contact me at 718-238-7613.



Richard Doucette
Environmental Program Manager
FAA New England Region

Cc: Stewart Dalzell, Massport
Danielle Palmer, NMFS



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

MAR 24 2010

Richard Doucette
Department of Transportation
Federal Aviation Administration
New England Region ANE-610
12 New England Executive Park
Burlington, Massachusetts, 01803

Re: Boston-Logan International Airport Runway Safety Area Improvement Project

Dear Mr. Doucette,

This is in response to your letter March 12, 2010 and the revised letter dated March 22, 2010 initiating informal consultation regarding the proposed Boston-Logan International Airport Runway Safety Area Improvement Project, specifically at Runway 33L and Runway 22R. The National Park Service (NPS) has made the preliminary determination that the proposed project is not likely to adversely affect any threatened or endangered species listed under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries) and has requested that NOAA Fisheries concur with this determination.

Four species of federally threatened or endangered sea turtles under the jurisdiction of NMFS may be found seasonally in the coastal waters of Massachusetts. The sea turtles in Massachusetts nearshore waters are typically small juveniles, with the most abundant being the federally threatened loggerhead (*Caretta caretta*) followed by the federally endangered Kemp's ridley (*Lepidochelys kempi*). Loggerheads and Kemp's ridleys have been documented in waters as cold as 11°C, but generally migrate northward when water temperatures exceed 16°C. These species are typically present in Massachusetts waters from June through November. Federally endangered leatherback sea turtles (*Dermochelys coriacea*) are located in New England waters during the warmer months as well. While leatherbacks are predominantly pelagic, they may occur close to shore, especially when pursuing their preferred jellyfish prey. Green sea turtles (*Chelonia mydas*) may also occur sporadically in New England waters, and any occurrence in Massachusetts waters is likely to be rare. Sea turtles are known to occur on Stellwagen Bank and in Massachusetts Bay. While no surveys for sea turtles have been conducted in Boston Harbor, suitable forage and habitat exists in this area. As such, it is likely that sea turtles occasionally are present in Boston Harbor and therefore, may occasionally be present in the action area.

Federally endangered North Atlantic right whales (*Eubalaena glacialis*) and humpback whales (*Megaptera novaeangliae*) are also found seasonally in Massachusetts waters. North Atlantic right whales have been documented in the nearshore waters of Massachusetts from December



MAR 26 2010

through June. Humpback whales feed during the spring, summer, and fall over a range that encompasses the eastern coast of the United States, including Massachusetts Bay. While these whale species are not considered residents of the Boston Harbor area, transients occasionally enter the area as they complete seasonal migrations in nearby Massachusetts Bay. For example, in April 1996 a right whale was documented in Boston Harbor and in the fall of 2000, a humpback whale was documented in Boston Harbor. Fin (*Balaenoptera physalus*), Sei (*Balaenoptera borealis*) and Sperm (*Physeter macrocephalus*) whales are also seasonally present in New England waters but are typically found in deeper offshore waters and are not likely to occur in Boston Harbor. Based on the available information, listed whales are likely to be rare within the action area.

After reviewal of the March 12th and March 22nd letter and pursuant to correspondence on March 18, 2010 NOAA Fisheries has determined that additional information is needed before informal consultation can be completed on the proposed project. Among the information needed is the following:

Runway 33L and the Light Pier

- Description of the size of the pile supported deck;
- Information on the in-water area covered by the deck as well as information on how far the deck and the light pier will extend into the water;
- Description of how the pile supported deck and the light pier will be constructed;
- Information on the diameter, number, and type of piles that will be installed, specifically in regards to piles being installed below the mean low water mark;
- Information on the construction methodologies that will be used to construct and install all components of the pile supported deck and light pier (i.e., excavation, vibratory/impact hammer, jetting); and,
- An assessment of the effects of the action on sea turtles and their habitat.

Runway 22R

- Description of how the inclined safety area will be constructed;
- Information on the amount and type of fill placed below the mean low water;
- Information on the construction methodologies that will be used to construct the inclined safety ramp;
- Information on any sediment or erosion control measures that will be in place throughout construction; and,
- An assessment of the effects of the action on sea turtles and their habitat.

This information is necessary to evaluate the impacts that this project will have on listed species present in Boston Harbor. When these project details are fully developed, please submit them to the attention of the Section 7 Coordinator, NMFS, Northeast Regional Office, Protected

Resources Division, 55 Great Republic Drive, Gloucester, MA 01930. After reviewing this information, NOAA Fisheries will be able to continue the consultation under Section 7 of the ESA. Should you have any questions regarding these comments, please contact Danielle Palmer at (978)282-8468.

Sincerely,



Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

Ec: Palmer
Boelke

File Code: Sec 7 DOT --Boston --Logan Airport Runway Safety Area Improvement Project
PCTS: T/NER/2010/01025



U.S. Department
of Transportation

**Federal Aviation
Administration**

Federal Aviation Administration
New England Region

12 New England Executive Park
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June 8, 2010

Mary A. Colligan
Assistant Regional Administrator for Protected Resources
U.S. Department of Commerce, NOAA
National Marine Fisheries Service, Northeast Region
55 Great Republic Drive
Gloucester MA 01930-2276

RE: Boston-Logan International Airport Runway Safety Area Improvements Project

Dear Ms. Colligan:

The Federal Aviation Administration (FAA), as the lead federal agency responsible for the Logan Runway Safety Area Improvements Project, has reviewed your letter of March 24, 2010 concerning potential effects to marine species protected under the Endangered Species Act. We have therefore prepared this response and request your concurrence. As documented below, we have determined that the proposed action could impact habitat potentially used by sea turtles, but would not result in an adverse effect that would jeopardize the continued existence of these species or adversely change their critical habitat.

Runway 33L RSA

This letter responds to the information requests relative to the proposed Runway 33L RSA:

1. Description of the size of the pile-supported deck;
2. Information on the in-water area covered by the deck as well as information on how far the deck and light pier will extend into the water;
3. Description of how the pile-supported deck and the light pier will be constructed;
4. Information on the diameter, number and type of piles that will be installed, specifically in regards to piles being installed below the mean low water mark;
5. Information on the construction methodologies that will be used to construct and install all components of the pile supported deck and light pier (i.e., excavation, vibratory/impact hammer, jetting); and
6. An assessment of the effects of the action on sea turtles and their habitat.

The information provided below is intended to answer these questions. The Massachusetts Port Authority (Massport), as owner and operator of Logan Airport, initially evaluated six, but has advanced five Construction Options for the proposed RSA improvements and has not finalized a preferred option. Massport has indicated that the RSA improvements will be a Design/Build project and that the final project design will be identified through that process, taking into consideration environmental impacts,

cost, constructability, and impacts on airport operations during construction. Please note that the proposed project no longer includes replacing the light pier beyond the limit of the proposed deck, although that effort is expected at a later date.

Response to Items 1 and 2

The Proposed Action for Runway 33L (Preliminary Alternative 4) is construction of a 600-foot long RSA with EMAS on a 300-foot wide Pile-Supported Deck. The decked portion of the RSA would be approximately 470 feet long and would extend over intertidal and subtidal areas. The Proposed Action also includes moving the existing localizer to a new pile-supported deck at the end of the RSA, and upgrading the existing approach light system. Part of the existing timber light pier (approximately 560 feet) would be removed and the approach lights would be incorporated into the new deck.

To facilitate emergency response, two emergency access ramps would be installed on either side of the proposed RSA in the intertidal area and ladders or concrete steps would be provided on the sides and end of the RSA. The localizer would be repositioned to the end of the RSA and installed on a 60-foot long and 300-foot wide pile-supported deck. The total area under the RSA deck and the localizer deck would be 159,000 square feet.

As noted above, the Runway 33L RSA improvements would include a pile-supported deck extending 470 feet into Boston Harbor. The alternate deck structures and piling combinations were evaluated at the conceptual design level to assess costs, minimize direct and indirect environmental impacts, and evaluate constructability. As described below, the overall impacts of the different deck and piling configurations to coastal wetlands resources and coastal processes would be similar.

All six deck and pile options would contain the following project elements:

- A RSA approximately 600 feet long located partially on land and partially on the proposed deck with various pile supporting options.
- A proposed deck structure approximately 470 feet long and 300 feet wide, with a surface area of approximately 141,000 square feet (3.2 acres);
- An EMAS bed approximately 500-feet long by 170-feet wide located within the RSA;
- One 25-foot wide emergency access ramp on either side of the proposed deck protected by riprap placed around the edge of the ramp;
- A steel sheet pile cutoff wall approximately 350 feet long at the inshore limit of the deck to prevent settlement and erosion of the backland areas;
- A transition slab (25 feet wide) spanning from the land to the pile-supported structure;
- A new deck to support the localizer, approximately 300 feet wide by 60 feet long, expected to consist of:
 - Thirty-three 16-inch diameter vertical piles,
 - Four 16-inch diameter batter piles¹ arranged in 11 bents and 3 rows, and

¹ A batter pile is a pile that is driven at an inclination to the vertical pile to provide resistance to horizontal forces.

- ❑ Cast-in-place pile caps with 15-inch thick precast/pre-stressed plank deck and 3-inch thick concrete overlay; and
- Finger pier extensions to the existing light pier to accommodate the CAT III ILS approach light system, with:
 - ❑ Three 5-foot by 40-foot extensions (8 new timber piles),
 - ❑ Three 5-foot by 35-foot extensions (6 new timber piles), and
 - ❑ Two 5-foot by 10-foot extensions (2 new timber piles).

Five piling/deck construction options will be evaluated in the Draft EA/EIR currently being prepared for the proposed RSA Improvements project, as described in Table 1 below. Option 4, which used 48-inch caissons and a 12-foot bent spacing, was eliminated due to substantially larger environmental impacts when compared to the other alternatives.

Table 1` Runway 33L Construction Options

Option	Pile Type	Pile Size (inch diameter)	Pile Number	Batter Piles ¹	Bent Number ²	Bent Spacing (ft)
1	Pipe Pile	20	442	48	26	12
2	Pipe Pile	20	182	48	7	70
3	Pipe Pile	20	155	48	5	100
5	Caisson	48	112	0	7	70
6	Caisson	48	80	0	5	100

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

² A pile bent is an array of piles driven in a row and fastened together at the top by a pile cap or bracing

Option 1: 20-Inch Diameter Pipe Pile with 12-Foot Bent Spacing

The deck and pile configuration of Option 1 includes the following:

- 442 vertical piles and 48 batter piles;
- 20-inch diameter pipe pile foundation system, driven to rock (steel pipe 6-30 inches typically filled with concrete and used for underpinning);
- 26-bent pile arrangement spaced 12 feet apart; and
- Cast in-place pile-cap deck system with 12-inch thick precast/pre-stressed plank deck and 3 inch thick concrete overlay (slab or connecting beam which covers the heads of a group of piles, tying them together so that the structural load is distributed and they act as a single unit).

Option 2: 20-Inch Diameter Pipe Pile with 70-Foot Bent Spacing

The deck and pile configuration of Option 2 includes the following:

- 182 vertical piles and 48 battered piles;
- 20-inch diameter pipe pile foundation system driven to rock;
- 7-bent pile arrangement spaced 70 feet apart; and
- Cast in-place pile cap deck system with precast/pre-stressed concrete "T" beams and 12-inch thick concrete overlay.

Option 3: 20-Inch Diameter Pipe Pile with 100-Foot Bent Spacing

The deck and pile configuration of Option 3 includes the following:

- 155 vertical piles and 48 battered piles;
- 20-inch diameter pipe pile foundation system driven to rock;
- 5-bent pile arrangement spaced 100 feet apart; and
- Cast in-place pile cap deck system with precast/pre-stressed concrete "T" beams and 12-inch thick concrete overlay.

Option 5: 48-Inch Drilled Shaft with 70-Foot Bent Spacing

The deck and pile configuration of Option 5 includes the following:

- 112 vertical caissons;
- 48-inch diameter drilled shaft concrete caissons socketed in rock;
- 7-bent caisson arrangement spaced 70 feet apart; and
- Cast in-place pile cap deck system with precast/pre-stressed concrete "T" beams and 12-inch thick concrete overlay.

Option 6: 48-Inch Drilled Shaft with 100-Foot Bent Spacing

The deck and pile configuration of Option 6 includes the following elements:

- 80 vertical caissons;
- 40-inch diameter drilled shaft concrete caissons socketed in rock;
- 5-bent caisson arrangement spaced 100 feet apart; and
- Cast in-place pile cap deck system with precast/pre-stressed concrete "T" beams and 12-inch thick concrete overlay.

Response to Item 3 and 5 (Construction)

Construction options 1, 2, and 3 would use 20-inch steel piles that would be set with a vibratory hammer and then driven to capacity with an impact hammer. The piles would be aligned in position using a template. The template would consist of 2 H-piles vibrated 20 feet into the bottom every 20 feet along the pile bents with a steel framework welded to the piles. Once the production piles are in place, the framework would be disassembled and the H-piles would be extracted using a vibratory hammer. All work would be done from a spud barge.

Construction options 5 and 6 would be installed using a steel pipe casing with a vibratory hammer using a barge-mounted crane. Once the casing is set to a specific elevation, a drilling rig would be brought in on a separate barge. The drill or auger would excavate the inside of the casing down through the clay and into the rock below. This process would remove sediment from the inside of the casing and place the material on the deck of a barge. This sediment would then be moved to a deck barge using a loader and scale pan for disposal off site at an approved facility. Excavate would be tested at a transfer location at the selected contractor's yard and disposed of according to Massport procedures and/or any permit

conditions. As the concrete is pumped in, the drilling fluid would be displaced up and out of the steel casing. The drilling fluid would be collected and filtered/de-sanded for reuse on the next caisson.

Typically the barges used to support the pile driving and drilling operations would be 45 feet wide by 150 feet long. The equipment would include 150-ton to 250-ton cranes depending on the operation. The barges would be supported by spuds (vertical steel shafts that hold the barge in place and at a constant elevation). Material barges would also be 45 feet wide and 150 feet long. It is assumed that a maximum of three spud barges would be required on site each day with two movements per day for repositioning and the initial mobilization and demobilization for each barge. The spuds would not be vibrated into the bottom; rather they would be set by dropping through the spud wells (gravity) to approximately five to ten feet deep.

When pile driving/caisson installation has sufficiently progressed to complete one bent, a reinforced concrete cap would be installed over those piles or caissons. The concrete cap would be formed using steel forms designed to span between the piles. Rebar would be installed with support from a barge-mounted crane. Forms and rebar would be delivered via barge. Concrete would be pumped into the forms via pumps from shore. Work would be supported by a barge mounted crane.

The long span (70 or 100 feet) New England Bulb Tee girders would be manufactured off-site at an approved precast concrete plant. The girders would be transported to the contractors staging site by barge or truck. The girders would then be placed on a transport barge (or if delivered by barge) would be towed to the project site for installation. To place the 100-foot long girders over the first span a large 300-ton crane would likely be required.

Option 1 would have a pre-cast plank deck with a poured concrete overlay. The precast planks would be manufactured off site. The planks would be delivered to the contractor's staging area via truck or barge. The planks would then be loaded onto barges and transported to the project site. A barge-mounted crane would hoist the planks into position on top of the pile caps. Following installation, a poured concrete deck overlay would be constructed starting from the shore and moving out toward the water. Options 2, 3, 5 and 6 would have a structural deck and a poured concrete overlay.

Response to Item 6

Although sea turtles have not been observed in Boston Harbor, the pile-supported deck could impact habitat potentially used by sea turtles, but would not result in an adverse effect that would jeopardize the continued existence of these species or adversely change their critical habitat in Boston Harbor. There would be no direct impacts to listed species. The five construction options would have a similar effect on eelgrass and therefore on sea turtle habitats.

Indirect effects to sea turtles, if present, could include effects on population persistence or stability due to the loss of food sources, and could potentially include health effects due to underwater construction noise. Indirect impacts to sea turtles could result from the loss of a portion of the eelgrass bed due to shading. The proposed Runway 33L RSA deck would likely result in the loss of approximately 61,000 square feet of eelgrass bed, approximately 3 percent of the total size of the 54-acre area currently occupied by eelgrass. The loss of part of the extensive eelgrass bed between Logan Airport and Deer Island would incrementally reduce the amount of available habitat for turtle food sources. However,

this is a small area and is not anticipated to affect the persistence of sea turtles in Boston Harbor or elsewhere.

Construction could result in temporary impacts to sea turtle habitat as a result of several activities. Construction is anticipated to generate suspended sediment which would, after a short time in the water column, settle on the bottom at depths up to 10 mm (0.4 inches). Sediment could settle on blades of eelgrass, affecting their ability to photosynthesize and grow and support populations of prey species. These impacts would be short-term and not anticipated to result in any long-term disruption of growth or population dynamics of sea turtles.

Construction equipment (barges, cranes, pile-driving, etc.) would result in activity and noise in the vicinity of Runway 33L. This would likely cause turtles to avoid the work area and therefore avoid impacts of sedimentation and noise. Construction, particularly pile-driving, can generate high noise levels underwater that could potentially harm turtles. However, these noise levels would decrease to levels unlikely to cause harm within 20 meters (66 feet) of the work area. Because of the activity and noise of construction, turtles (if present in Boston Harbor) would be expected to avoid the area during active in-water construction. Pile driving is anticipated to occur for a short time in 2011, and throughout the 2012 construction season (July through November).

FAA *Order 1050.1E* defines a significant impact for endangered species as one when the USFWS or NMFS determines a proposed action would likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat. As documented in this section, the FAA has determined that the proposed Runway 33L RSA improvements would have an effect, but not an adverse effect, on the habitat of sea turtles. These safety improvements would not have a significant effect on endangered species.

Runway 22R

This letter responds to the information requests relative to the proposed Runway 22R RSA:

1. Description of how the inclined safety area will be constructed.
2. Information on the amount and type of fill placed below the mean low water;
3. Information on the construction methodologies that will be used to construct the inclined safety ramp;
4. An assessment of the effects of the action on sea turtles and their habitat.

Response to Questions 1 and 3

The proposed Runway 22R safety improvement is to construct an Inclined Safety Area, approximately 130 feet long and 500 feet wide, extending from the existing perimeter road to the low water elevation. This ISA would be similar to the existing Runway 22L ISA, and would be constructed of crushed stone with a perimeter stone gabion. The inclined safety area would allow aircraft to transition from the RSA to the water while minimizing damage to aircraft and would provide access for emergency responders in the event of an accident. The current construction methodology includes the following steps:

- Excavate a trench around the perimeter of the proposed Runway 22R ISA to serve as the location of stone filled gabions (stone filled baskets used to stabilize soil and prevent erosion);

- Install gabions in the trench to serve as a barrier around the excavation with filter fabric on the inside of the gabion structure to minimize the dispersion of sediment;
- Excavate and grade the interior of the ISA, once the gabions are in place;
- Place clean stone fill and compact.

The work would occur partly within the intertidal zone, thereby subjecting the materials to boat wake action. During excavation/dredging it is likely that the contractor would work with the tides such that there is no underwater excavation. Dredging is expected to occur using an excavator and small crane from the upland to avoid the need for equipment in the water. Appropriate sedimentation controls would be installed prior to construction.

Soils at Runway 22R would be pre-characterized to determine the material make-up. Based on these results, soils would be excavated out of the intertidal area and placed in trucks for transport to either a Massport-approved disposal facility or the Airport's Central Testing Area (CTA) for testing per standard operating procedure at the Airport before being trucked off-site. This process avoids the need to first stockpile all material at the runway end and then truck all material to the CTA for testing.

All construction materials would likely be transported by truck to the site because of the nature and location of the work area. It is not feasible to transport material by barge. Massport will evaluate whether barging could be used to bring stone and/or stone gabions to the site.

Response to Question 3

The proposed Runway 22R ISA would be similar to the ISA previously constructed at the Runway 22L end. It would require gravel fill to be placed approximately 130 feet north from the top of Coastal Bank and would be graded over the full width of the extended safety area down to the mean lower low water elevation.² The proposed Runway 22R ISA would include placing approximately 8,500 cubic yards of fill, contained within a perimeter wall of stone-filled gabions and surfaced with crushed stone. After nearly 20 years, the 22L ISA remains stable with no observed movement of stone or sediment beyond the gabions.

Response to Question 4

Although no sea turtles have been observed in Boston Harbor, the proposed Runway 22R ISA could impact habitat potentially used by sea turtles but would not result in an adverse effect that would jeopardize the continued existence of these species or adversely change their critical habitat. The proposed Runway 22R ISA would result in the loss of approximately 1.4 acres of intertidal habitat and 700 square feet of subtidal habitat that could potentially be used by sea turtles. Although sea turtles have never been reported in Boston Harbor, NMFS considers that sea turtles may be found seasonally in Boston Harbor. Shellfish, mollusks, benthic organisms, and jellyfish found at the Runway 22R end are potential food sources for sea turtles. The impact area is minor, and there is similar habitat and substrate in the areas adjacent to the Project area. The potential food sources at the Runway 22R end in the area of

² Mean Lower Low Water (MLLW) = the average daily lower low water level of the tide at a location. Some locations have diurnal tides--one high tide and one low tide per day. At most locations, there are semidiurnal tides--the tide cycles through a high and low twice each day, with one of the two high tides being higher than the other and one of the two low tides being lower than the other.

the proposed ISA could move to adjacent, similar habitat or attach to the proposed ISA providing food sources and habitat for sea turtles.

Temporary construction noise and turbidity are not anticipated to affect sea turtles, in the event that any sea turtles were present in Boston Harbor. Temporary construction impacts to water quality may occur during the placement of the gravel fill and dredging or excavation. Controls for water pollution and soil erosion, such as using a siltation curtain and a debris boom to contain and minimize any siltation or debris, would be implemented during construction to minimize impacts. These controls would also act as a barrier to keep sea turtles out of the construction area, avoiding any incidental mortality. Placing fill in the proposed ISA would not result in underwater noise impacts that could potentially affect marine wildlife.

FAA *Order 1050.1E* defines a significant impact for endangered species as one when the FWS or the National Marine Fisheries Service determines a proposed action would likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat. As documented in this section, the FAA has determined that the proposed Runway 22R RSA improvements would have an effect, but not an adverse effect, on the habitat of sea turtles. Accordingly, these safety improvements will have a significant public safety benefit and would not have a significant impact on endangered species

I believe that this addresses the information that you requested in the March 24, 2010 letter. If you have any questions or require additional information, please contact me at 718-238-7613.



Richard Doucette
Environmental Program Manager
FAA New England Region

Cc: Stewart Dalzell, Massport
Danielle Palmer, NMFS



U.S. Army Corps of Engineers



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REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

March 12, 2010

Regulatory Division
CENAE-R-2007-2676

Stewart Dalzell
Deputy Director, Environmental Planning and Permitting
Massachusetts Port Authority
One Harborside Drive, Suite 2008
East Boston, MA 02128-2909

RE: Logan International Airport, Runway Safety Improvements Project
Basic Project Purpose Determination

Dear Mr. Dalzell:

We are currently reviewing your pre-application submittals for the placement of fill material below the high tide line of Boston Harbor for the proposed Runway Safety Area (RSA) enhancements at Runway 33L and Runway 22R at Logan Airport. This work will require authorization under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. We have determined that the basic project purpose is to increase safety for aircraft and their passengers in emergency situations by enhancing the RSAs at the ends of Runway 33L and Runway 22R consistent with FAA orders and regulations.

We will use this basic project purpose to analyze alternatives to avoid and minimize adverse impacts to waters and wetlands in order to comply with the Section 404(b)(1) Guidelines.

If you have any questions concerning this matter, please contact Ted Lento, Regulatory Division project manager, at (978) 318-8863.

Sincerely,

Karen Kirk Adams
Chief, Permits & Enforcement Branch
Regulatory Division

Copy Furnished:

Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts, reiner.ed@epa.gov

Christopher Boelke, National Marine Fisheries Service, Gloucester, Massachusetts,
christopher.boelke@noaa.gov

Robert Boeri, Coastal Zone Management, Boston, Massachusetts, Robert.Boeri@state.ma.us



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U.S. Department of Agriculture



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December 14, 2010

United States
Department of
Agriculture

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Inspection
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Wildlife Services

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Amherst MA 01002
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F 413 253 7577

[www.aphis.usda.gov/
wildlife_damage/](http://www.aphis.usda.gov/wildlife_damage/)

Stewart Dalzell
Deputy Director
Environmental Planning and Permitting
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

Re.: Boston-Logan International Airport/Runway Safety Area Improvements Project
Potential Salt Marsh Mitigation Site Wildlife Hazard Review

Dear Mr. Dalzell,

I certainly appreciated the invitation you extended to staff of the U.S. Department of Agriculture (USDA) – Animal and Plant Health Inspection Services' (APHIS) – Wildlife Services (WS) MA/CT/RI program to meet with you and your representative to discuss the Logan Airport Runway Safety Area Improvements Project. I hope that our participation and the information that we shared was helpful to you and all others working together with you in conducting all the necessary steps, reviews, and processes to affect completion of the project. During our meeting you and your representative briefed us on the activities of the Salt Marsh Working Group, and described several potential mitigation locations in close proximity to Logan International Airport that were under review –and as presented, were in accordance with a corresponding FAA Advisory Circular.

Regarding your letter [Dated: November 15th, 2010], I am providing the following responses on behalf of the APHIS WS-MA/CT/RI program.

- The APHIS WS MA/CT/RI program concurs that the existing salt marsh areas at Logan are known to attract wildlife causing hazards to aircraft operations. This statement of fact is known to me as well as a number of other personnel of both WS and Massport. In addition to fulltime WS and Massport personnel stationed at Logan, I have personally observed various wild animals feeding within, loafing within, and using as cover, salt marsh vegetation and adjacent areas on Logan. Though not exclusive, all of the wild animal species discussed, are known to be or create serious aircraft strike risks at airports. Birds are even greater risks when numbers exhibit increasing flock conditions. We further concur that many of the bird species discussed have been observed crossing runway areas moving from one marsh site to another.
- The conclusion of the APHIS WS MA/CT/RI program and of my considered professional judgment is that constructing additional salt marsh areas on airport property within aircraft operation areas (and including within 10,000 feet of runways –an area we discussed previously) would be detrimental to aircraft operations. Such actions would likely increase the intensity of wildlife conflicts, and further exacerbate existing wildlife hazard problems at Logan.
- APHIS WS MA/CT/RI program's position is that salt marsh areas adjacent to the runways and taxiways currently serve as an attractant for wildlife species causing hazards to aircraft operations and that off-site mitigation should be pursued, where offsite opportunities may exist. Realizing the existence of these known hazards, and the need to pursue described safety project activities that may unfortunately result in a loss of salt marsh habitat, is more appropriately, and likely similarly as effective, and certainly more safely addressed at off-site potential mitigation locations.



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- Though not exhaustive, some factors considered by APHIS WS when evaluating or assessing wildlife hazards include distance from airport runways, historic land use, aircraft operation characteristics, and future potential attractiveness to wildlife that then cause hazards to aircraft operations. Potential mitigation sites at greater distances from airport/aircraft operation areas would likely have diminishing hazard risks, where and when average ceiling heights of those corresponding aircraft operations increase.
- As discussed, effective opportunities for mitigation have been identified more than 10,000 feet from runway areas. Because the APHIS WS MA/CT/RI program identifies that salt marsh areas adjacent to runways and taxiways currently serve as attractants for wildlife, and increase hazard risks to aircraft operations, we recommend that only offsite mitigation locations should be carried forward for further consideration.

In summary, the APHIS WS MA/CT/RI program concludes that salt marsh areas currently existing on Boston's Logan International Airport and the creation/restoration on or near the airport does –and would, attract wildlife and would thereby exacerbate existing airport wildlife hazard problems. Effective offsite mitigation opportunities located more than 10,000 feet from Logan's runways should be carried forward for further consideration.

Again, we appreciate the opportunity to participate and provide assistance in this safety project.

Sincerely,



Monte D. Chandler
State Director
MA/CT/RI Program
USDA-APHIS-Wildlife Services



U.S. Fish and Wildlife Service



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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087



December 10, 2007

Reference:	<u>Project</u>	<u>Location</u>
	Airport safety improvements	Boston, MA
	Industrial park	Fall River, MA

Gene Crouch
Frank Bracaglia
Vanasse Hangen Brustlin, Inc.
P.O. Box 9151
Watertown, MA 02471-9151

Dear Messrs. Crouch and Bracaglia:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.


In order to curtail the need to contact this office in the future for updated lists of federally-listed or proposed threatened or endangered species and critical habitats, please visit the Endangered Species Consultation page on the New England Field Office's website:

www.fws.gov/northeast/newenglandfieldoffice/EndangeredSpec-Consultation.htm

In addition, there is a link to procedures that may allow you to conclude if habitat for a listed species is present in the project area. If no habitat exists, then no federally-listed species are present in the project area and there is no need to contact us for further consultation. If the above conclusion cannot be reached, further consultation with this office is advised. Information describing the nature and location of the proposed activity that should be provided to us for further informal consultation can be found at the above-referenced site.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Anthony P. Tur". The signature is written in a cursive style with a large initial 'A'.

Anthony P. Tur
Endangered Species Specialist
New England Field Office

