SAUGUS/PINES RIVER ESTUARY and RUMNEY MARSH
ENVIRONMENTAL BENEFITS & MITIGATION
REGIONAL SAUGUS RIVER FLOODGATE PROJECT

MARCH 23, 2021

INTRODUCTION

The communities of Everett, Lynn, Malden, Revere, and Saugus, MA, are pursuing renewed State and Federal support for the Regional Saugus River Floodgate Project (the "Project") to protect over 5,100 residential and commercial properties from sea level rise and the worst coastal flooding likely to occur over the next 50 to 100 years. The Project previously was supported and sponsored by the State 27 years ago. State resource and permit agency representatives recently questioned Revere officials on potential impacts of the Project's floodgates, at the mouth of the Saugus River, regarding concerns which could adversely affect the 1,650 estuary located landward of the floodgates, an estuary designated as an Area of Critical Environmental Concern (ACEC).

PRIOR INVESTIGATION

Similar concerns were also voiced by four (4) community Steering Committees and a Technical Group during the original seven (7) year, $8.6 million planning and design effort, managed by the Army Corps of Engineers (ACOE). The Technical Group included Federal and State resource agencies, private interest groups, community representatives, and Corps managers. Over 100 meetings were held to evaluate the plans and obtain constructive criticisms and solutions, and reduce or eliminate environmental impacts and formulate beneficial features during the investigation. This document intends to help these same organizations, unfamiliar with the original Project and prior coordination, understand the environmental concerns and how they were mitigated, resulting in a positive Certificate from the Environmental Secretary and State support with funding commitments by the President and State representative.

ENVIRONMENTAL BENEFITS & MITIGATION

Revere requested a listing of significant environmental mitigation measures and benefits associated with the Project, especially the floodgates, which include:

1. Eliminate coastal flooding to over 5,100 residential and commercial properties, for over 400,000 commuters, and stop flood-associated pollution of wetlands;
2. Environmental investigations resulted in Rumney Marsh ACEC Designation;
3. Maintain marsh vitality by closing 9-floodgates after wetlands are inundated with tidal waters;
4. Maintain marsh buildup since 500 feet of floodgate openings maintain natural flushing and tide levels in the estuary, and dune restoration benefits sediment transport into marsh;
5. Purchase 1,650 acres of estuary lands to preserve wetlands and flood storage;
6. Provide environmental managers for estuary to protect, manage and educate;
7. Provide public safety for up to 30,000 residents and employees and avoid hazardous-slow evacuations on inundated roads by providing flood protection;
8. Design the Project to be easily modified for rising sea levels;
9. Mitigate the loss of 2 to 4.8 acres of intertidal habitat with removal of I-95 fill;
10. Relocate 3,100 feet of Lynn Harbor Dike inland, avoiding 4.1 acres of significant intertidal impacts;
11. Restore sand dunes at Point of Pines in lieu of 3,120 feet of stone revetments;
12. Restore flushing to 500 acres of wetland by implementing or providing the opportunity to breach or remove a mile of the abandoned I-95 embankment;
13. Eliminate threat of tidal surges from eroding Saugus Wheelabrator landfill to avoid potential release of contaminates into wetlands and communities;
14. Construct 3,420 feet of Revere Beach Park Dike inland, and preserve a 20 acre Ponding Area in lieu of hard structures;
15. Floodgates eliminate the need for 25 miles of walls up to 14 feet high along the banks of the rivers and estuary which would cause significant impacts; and,
16. Provide an improved Harbor of Refuge for the 400 vessels moored in the area.

ENVIRONMENTAL CONCERNS

The Massachusetts Environmental Affairs Secretary's 20 February 1990 Certificate on the Final Environmental Impact Report for the Project stated that the "…project adequately and properly complies with the Massachusetts Environmental Policy Act .. and with its implementing regulations.." Then, on 5 March 1990, the Secretary assigned the Metropolitan District Commission (MDC) as the State sponsor in support of the Project (see website). The Certificate addressed major estuary issues and concerns following the receipt of public and agency comments on the Project and on the combined EIS/EIR. Each of these concerns and others are discussed below.

1. **Flooding & Associated Pollution** – The Project: will eliminate the threat of coastal Flooding, including the worst coastal storm likely to occur and sea level rise; will protect residents and employees on over 5,100 residential and commercial properties; delete the requirement for flood insurance; protect arteries for 400,000 commuters; and will protect the wetlands in the estuary from associated pollution flushing from the properties. The Blizzard of 1978 flooded 3,100 buildings with 4,000 people evacuated. Rising sea levels are flooding low lying properties more frequently and the Bomb Cyclone of 2018 set a new tidal record.

2. **Area of Critical Environmental Concern (ACEC) Designation** – The extensive environmental investigations conducted during the Saugus River and Tributaries Flood Damage Reduction Study revealed the significant value of resources in the Saugus/Pines River Estuary and noted the continued loss of wetlands over the years. The coordination with agencies resulted in the realization that the estuary needed additional protection. As a result, the State gave the estuary, also known as the Rumney Marsh, the highest environmental protection possible as an Area of Critical Environmental Concern (ACEC) on 22 August 1988. The Saugus River Flood Damage Reduction Project was specifically allowed in the designation (ACEC Designation page 4).

3. **Marsh Vitality** – The Secretary's Certificate reported that "Several commentors suggest that by stopping the peak of flooding events, the marsh complex would shift in composition and boundary. It should be noted that all marshes have been identified as existing below elevation 7. The proposed operation of the tide/storm barriers calls for closure of the barrier when the tide event has reached elevation 7, when all marsh would be inundated. At that time, the Saugus River would continue to flow, and most of the tributary land area not blocked by tide gates would continue to drain as well. Thus, the water level behind the barrier will peak above elevation 7. In addition, wind action within the estuary will continue to act on the water body to create internal circulation and tend to decrease salinity gradients as at present. Since no significant changes in tidal exchange, or low or mid tide levels, are anticipated with the main gate and the "tainter" gates, I agree with the EIR conclusions that mitigation has been included to minimize the potential marsh impacts of the storm barrier."

   Further, the available flood water storage in the estuary above elevation 7 feet, NGVD is sufficient for 100 year runoff from surrounding lands. It will take about

20 minutes to close all nine (9) gates, when a coastal storm threatens to cause damages. Each gate has a backup generator. The steering committees had the opportunity to visit the New Bedford Harbor Hurricane Barrier and the Fox Point Barrier in Rhode Island, which have used the same types of gates (miter and tainter) since the 1960s, operated and maintained by ACOE and the City.

4. **Marsh Buildup** – The Secretary's Certificate reported that "Commentors have suggested that storm event sediment transport will be crucial to the survival of the salt marsh with sea level rise. It should be noted that the estuary is located behind a barrier beach which would be expected to contribute significant quantities of sand (sediments) during future storm events with sea level rise if it were not heavily developed and protected by structures at this time. The combination of these two factors limit's the quantity of sand which would occur as a result of overwashes. The second major source of sediments are those from the river system. These are not changed by the barrier, or may be enhanced slightly as the flow gradient may continue longer into the basin behind the barrier. The last source of sediments is from reversals in river flow. Sediments delivered to the mouth of the river can move some distance upstream. In the case of the Saugus River, the protection of Nahant and its causeway limit the ability of storms to deliver sediments to the river mouth. Only storms from the Southeast are significant in moving sand from the River beach to the river mouth. With the gates open until the storm surge reaches 7 feet, a significant period of sediment transport is preserved. Only long term monitoring of marshes will determine if they can adjust to sea level changes as they occur. This EIR is not the place to require such basic research."

   Floodgate design criteria provide safe passage for navigation, can adapt to sea level rise, and support the natural tide ranges and flushing of the estuary. To accomplish this, detailed surveys and tide gauging were accomplished throughout the estuary and Broad Sound followed by development of numerical and physical models. These models were initially calibrated with the natural conditions. Steering committee members were flown to Vicksburg, Mississippi, to view the physical and numerical models and to operate the scaled lobster boat and oil tanker through the navigation gate. Details and photos of both models and the 9 gated openings are shown on the Project's website. The gates include a 100-foot wide, 33-foot high miter/navigation gate and the eight (8), 50-foot wide, 21-foot

high tainter/flushing gates. The results of the modeling are documented in the Hydrology and Hydraulics Feature Design Memorandums, dated December 1993. See web site "Milestones & Reports" for "Design Documents" under Item#8. Modeling wave overtopping and dune/beach erosion of both armor stone revetments and potential sand dune restoration for Point of Pines near the mouth of the Saugus River showed the very high level of protection afforded by restored dunes, in lieu of the planned revetments. The 100,000 cubic yards of sand from the I-95 embankment needed to restore the beach and dunes also would contribute to the sediment budget.

5. **Acquisition of Flood Storage Lands** – The Secretary's Certificate stated that "Comments have suggested that the land acquisition may not occur. It is my position that the land acquisition is now a part of the program and that it must occur. If that fact should change, the environmental review of the project would be reopened in response to notification of project change."

   A major concern of the Project was the potential pressure that flood protection would place on the estuary by encouraging development or encroachment into the wetlands. The Corps agreed that neither the ACEC designation, nor easements were sufficient to protect both the natural resources of the estuary and the required flood storage needed for the Project. Therefore, the Project's Final Report was revised to include fee acquisition of the 1,650 acre estuary at $16 million (2020 price level).

6. **Provide Environmental Managers to Protect Wetlands** – The Project includes full time environmental managers to oversee the protection and regulatory management of the estuary. In addition, their responsibility will be to provide an educational opportunity for the residents to learn to appreciate the value of the estuary and its resources. The effort and cost for this management effort is significant at $186,000 annually (2020 price level) and was included in the Project features and cost.

7. **Evacuation and Flood Proofing** – The Secretary's Certificate reported that "Comments indicate that many feel that evacuation and flood proofing are viable options and must be used to avoid any of the identified impacts to the environment. I am persuaded by the evidence in the EIR that flooding events in this particular estuary are difficult to predict in time to allow orderly evacuation.

Study has indicated that combinations of events during the storm are in many cases crucial to the decision making and many false emergencies would have to be declared under the existing conditions. This information will be further reviewed as the state decides whether to endorse and participate in the recommended project."

The nonstructural plan was rejected by the communities because only 7% of the affected structures could be partially protected with flood proofing or raising; no protection was provided for infrastructure or for local and regional transportation arteries serving Boston's north shore; and the uncertainty and difficulty of warning and evacuating 10,000 to 30,000 people.

8. **Project Adaptation to Sea Level Rise** – The Secretary's Certificate reported that "The capability to respond to sea level rise has been requested by state agencies. The EIR has stated that the structures will be designed so that sea level changes up to 3 or 4 feet can be accommodated if future study determines that such changes are desirable, feasible and environmentally acceptable."

9. **Wetland Mitigation** – The Secretary's Certificate noted that "Commentors have identified the state policy as requiring greater than one to one compensation for loss of wetland resource areas. I concur with that information and conclude that enough information is contained in the DEIR and FEIR for the appropriate state agencies to require the needed mitigation." The proposed Project mitigation site would compensate for the loss of 2 to 4.8 acres of intertidal habitat depending on final dredging and alignments. A plan approved by the Secretary on 12 April 1993 appears on the website with removal of the I-95 embankment.

10. **Lynn Harbor Dike Impact** – The original design for the 3,100-foot long Lynn Harbor Dike (with passive recreation on the surface) was to locate it along the ocean side of the existing deteriorated bulkhead alignment extending to a width of about 65 feet over the existing mudflats, covering about 4.6 acres of intertidal habitat. To significantly reduce this impact in coordination with the City, the dike was relocated inland with only 6-9 feet of the toe at the surface of the mudflats, affecting about 0.5 acres.

11. **Point Of Pines' Revetment vs. Sand Dunes** – The original design to prevent significant overtopping along the Point of Pines shorefront was a 3,120 foot long

stone revetment to a height, economically optimized, that would reduce overtopping to the (then) 100 year, 1978 storm level. However, numerical and physical modeling and evaluation of existing I-95 sand material and its erosion along Revere Beach revealed that sand dunes and a beach restored with I-95 sand could prevent overtopping against the Standard Project Northeaster (SPN), the worst coastal storm likely to occur. A dune/beach system would be much more effective environmentally, aesthetically more acceptable, and less costly than revetments, provided that assurances are given that the dune beach system and fence with cross over-walkways would be maintained.

12. **Breaching or Removing the Abandoned I-95 Embankment** – Federal and State agencies and the Town of Saugus support breaching or removing the abandoned I-95 embankment once the project is built to restore flushing to 500 acres of the upper estuary. Several Federal agencies specifically requested that the Corps investigate breaching the embankment to restore the wetlands and enhance the upper estuary. This is also a goal of the ACEC designation. The evaluation and design for breaching the embankment was well underway by the Corps, which also included mitigating the impact on the East Saugus drainage system which would be adversely affected by higher frequent tides. The numerical and physical models developed by the Corps to evaluate the floodgate openings were also used to evaluate breaching the I-95 embankment and the impacts on tide levels in East Saugus. This effort was placed on hold when the Project was suspended in 1993. The website contains additional information and explains from a draft report why the $6.6 million (2020 price level) cost is expected to be justified for marsh restoration and enhancement. There are about 200,000 cubic yards of I-95 embankment (bordering 4 mitigation sites) covering about 15 acres of wetlands, which could be removed along a mile of the marsh where an I-95 embankment berm remains.

13. **Erosion of Wheelabrator Landfill** – The Town of Saugus and other interest groups have voiced concern that coastal storms will erode the embankment of the Wheelabrator landfill located in the center of the estuary and contribute to the spreading of its pollutants into the surrounding communities and wetlands. Removing the threat of coastal floods surging into the estuary would significantly reduce wave action and tidal flooding of the landfill and any potential erosion. The Conservation Law Foundation is reported to be very concerned about the pollutants leaching out of the landfill.

State Representative RoseLee Vincent's August 6, 2020 letter (see "Status" on website) to Governor Baker stated support for reinstating the Project and also that the Project "…would also be critical in restoring portions of the East Saugus Marshes….I can attest that this project is sorely needed now…the Wheelabrator Saugus incinerator, whose unlined ash landfill is adjacent to the banks of the river. A major concern...is that one day, a severe coastal storm will breach the landfill, sending contaminates flowing into the river…and into their homes."

14. **Revere Beach Park Dike & Ponding Area** – The two very vulnerable areas along Revere Beach subject to severe wave overtopping are in the vicinity of the Police Station and at the north end of the beach. In lieu of using hard structures, such as raising and replacing walls or stone revetments to prevent overtopping, other alternatives are used. In the Police Station area, a 3,420-foot long park embankment or dike would be constructed landward of the existing seawall on vacant land from Beach Street to Revere Street. The dike would be constructed higher than the seawall to prevent overtopping from reaching developed areas. Additional embankment would be added and oriented toward the ocean for a more aesthetic view with features for passive recreation.

    At the north end of Revere Beach, a 20 acre existing ponding area would be acquired behind the homes bordering North Shore Road. The ponding area is about 3,400 feet long and would store waters overtopping the seawall and, if filled up, would overflow to the estuary. Due to the quality of the I-95 sand, the material could be used to continue the dune restoration program along Revere Beach.

15. **Eliminate 25 Miles of Walls** – The floodgates would eliminate the need for 25 miles of walls up to 12-14 feet high along the banks of the Saugus and Pines Rivers and the estuary to protect developed areas to the same level as the floodgates. Walls cause the loss of wetlands, obstruct views, adversely affect the aesthetics, and require extensive drainage systems and pumping stations.

16. **Harbor of Refuge** – The floodgates, when closed during coastal storms, would provide an improved Harbor of Refuge within the rivers for the 400 commercial and recreational vessels moored along the Saugus and Pines Rivers and in Lynn Harbor.

WHY PROJECT WAS DISCONTINUED

The Regional Project was put on hold in September 1993 (after several Secretaries had supported it) since a new Massachusetts Environmental Secretary, an environmental activist from Rhode Island, was opposed to construction along the coast and, reportedly, wanted to further review nonstructural solutions, which was never done.

DOCUMENT PREPARATION

This document was prepared by Robert Hunt, Senior Project Manager of the Project, ACOE retired, at Revere's request, with comments from the following who also worked on the original Project: Steve Davis, formerly head of MEPA & Assistant Secretary of Environmental Affairs; Frank Stringi, Revere Planning Office; and Joe Horowitz, Environmental Manager and preparer for the Draft EIS/EIR, ACOE retired. Ms. Elle Baker, Revere Planning, also reviewed it, and is responsible for organizing support by developing a Regional Advocacy Group. Messrs. Davis, Horowitz, and Hunt prepared correspondence with presentations over the past 2 years to advise communities, State agencies and legislators about the Project. The ACOE was provided the opportunity to comment on this draft document, but the Corps' Chief Evaluation Branch responded, understandably, that: "Given that the information in the report is 30 years old and we haven't been involved since, we're not in a position to comment right now. We're looking forward to working with everyone once the project is funded."

ACCESSING REPORTS

The following are referenced in this document and can be accessed from the Project's website (saugusriverfloodgates.com) under "Milestones & Reports": Final Feasibility Report; Final EIS/EIR; Secretary's Certificate; ACEC Declaration; MDC letter; and Design Documents. Also on the website are: recent community support letters (from four city mayors and town manager, and Revere City Council), a brochure, photos, estuary video, alternatives, Project description, and status section. Committee members are listed in the back of the Main Report. The Project has been identified as the: Regional Saugus River Floodgate Project; Saugus River and Tributaries Flood Damage Reduction Project; and Saugus River Flood Damage Reduction Project.

CONTACTS

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