

Draft Final Integrated Interim Response  
Feasibility Report and Environmental  
Assessment for Actionable Elements

**NEW YORK-NEW JERSEY  
HARBOR AND TRIBUTARIES  
COASTAL STORM RISK MANAGEMENT  
FEASIBILITY STUDY**

**APPENDIX H  
ITERATIVE PLANNING & ANALYSIS**

March 2026

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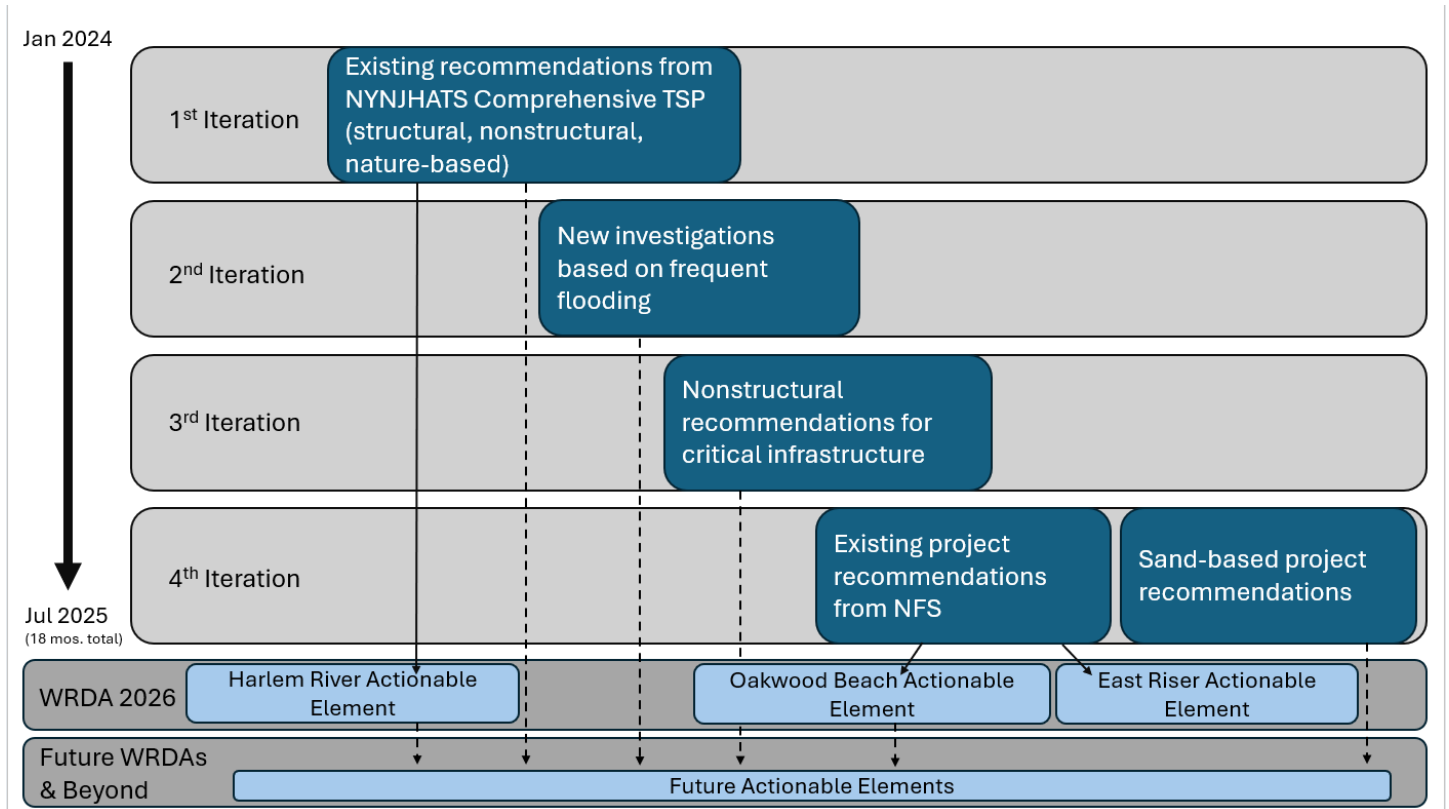
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**“ \* ” Refers to Actionable Element Sites**

# 1 INTRODUCTION

This Appendix presents the iterative plan formulation process and analyses used to identify Actionable Element Sites for authorization within a potential Water Resources Development Act (WRDA) 2026. Through four different iterations of planning, over one hundred different site locations and several types of measures, were evaluated and discussed as part of this NYNJHATS Interim Response effort (**Figure 1**). This Appendix will present all sites that were identified throughout the different iterations of planning and summarize the New York District’s reasoning for how the sites were eliminated, to ultimately result in the three Actionable Element Sites being chosen as the Tentatively Selected Plan (TSP), in the July 2025 Draft Report. As well as, how the NYNJHATS team has since performed further analyses, through optimization, that have led to the New York District’s Recommended Plan, East Riser, as further described within the main report.



**Figure 1: Iterative Planning Process**

## 2 ACTIONABLE ELEMENT SITES

Upon conclusion of discussions with the Office of the Assistant Secretary of the Army (Civil Works), Headquarters of the U.S. Army Corps of Engineers (USACE), and the USACE North Atlantic Division, as well as the non-Federal Sponsors (NFS) and Partners, the NYNJHAT Study team shifted focus to begin investigating near-term separable elements for accelerated construction authorization within a potential WRDA 2026.

### 2.1 SCREENING

Initially, through the first iteration of screening, the New York District utilized information from the September 2022 Draft Feasibility Report (FR) and Tier 1 (Programmatic) Environmental Impact Assessment (EIS), to form a list of site locations to study potential projects to manage coastal storm risk. This list largely includes the High Frequency Flooding Risk Reduction Features (HFFRRFs), Induced Flooding Features (IIFs), and other areas of interest – as highlighted through comments received on the September 2022 Draft FR/Tier 1 (Programmatic) EIS or conversations with the NFS – and nonstructural measures identified across alternatives 2-5. The New York District considered the criteria listed below, and screened sites that were not hydrologically independent or capable of meeting the restricted timeline to reach the deadline for inclusion in a potential WRDA 2026. Given these restrictions, the New York District specifically sought out projects that were on land and:

- Must be able to achieve full NEPA compliance by primarily avoiding in-water work, in order to ensure any project considered was capable of achieving environmental compliance in the limited time;
- Must avoid Hazardous, Toxic, and Radioactive Waste (HTRW), as USACE, by law, requires a clean site prior to the start of construction;
- Must avoid sites that would predispose the selection of the Comprehensive Plan by directly impacting or otherwise influence the decision of the Tentatively Selected Plan for the Comprehensive Plan;
- Must not require implementation of Comprehensive Plan to be functional, whereas to ensure hydrologic independence and full functionality of the constructable elements, in advance of implementation of the Comprehensive Plan;
- Must not require field investigations to achieve appropriate design maturity required for a Class 3 cost estimate by prioritizing site locations that had existing data, such as geotechnical borings and survey data, to eliminate the need for site investigations that would take time and funding past the approved amount and therefore, make the goal to achieve construction authorization within WRDA 2026, unattainable;
- Will seek to prioritize site locations that benefit critical infrastructure within the General Study Area, whereas to benefit the local economy and the largest number of people within each Actionable Element Site.

A combination of measures, to include structural, nonstructural, and nature-based solutions (NBS), overlapped and were considered throughout the entire 18-month planning process. In an attempt to address public and stakeholder comments, regarding advancement of the Comprehensive TSP from September 2022, the study team investigated a number of measures that were studied as part of the final array of alternatives from the Draft Integrated FR/Tier 1 (Programmatic) EIS. More specifically, one site that was investigated for structural measure implementation during the first iteration – the Harlem River Actionable Element Site, or formerly the ‘East Harlem Shoreline-Based Measure’, from the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS – was advanced as part of this Interim Response.

### 2.1.1 First Iteration and Second Iteration

**Table 1** shows the initial 91 sites that were investigated to consider feasibility of an Actionable Element project to address coastal storm risk. All of these initial sites, primarily structural measures, were initially screened in the first iteration due to the lack of existing site data that was found or acquired.

**Table 1: First Iteration of Potential Actionable Element Sites Considered**

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive Alternatives, NFS, etc.))	Type of Measure
Arthur Kill HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Atlantic Basin HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Bayonne Bridge HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Bayswater Park HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Bergen Pt SI HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Breezy Point HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Bridge Street Bridge HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Broad Channel HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Canarsie HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Caseys Creek HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Chelsea HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Clay Street Bridge HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Coney Island Creek HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Dock Bridge HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Elizabeth River HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Elizabeth Port HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Essex County Correctional Facility HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive Alternatives, NFS, etc.))	Type of Measure
Flushing Creek HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Fort Hancock HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Gowanus Canal HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Green Point LI HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Harrison Reach HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Head of Bay Gate HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Highlands HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Hudson County Correctional Facility HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Inwood Marina HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Jersey City HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Kearny Point HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Kips Bay HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Lenox Yard HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Leonardo HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Long Island City HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Many Mind Creek HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Mariners Harbor SI E HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Mariners Harbor SI W HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Meadowlands Gate HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Morses Creek HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Motts Basin N HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Motts Basin S HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive Alternatives, NFS, etc.))	Type of Measure
Newton Creek (see RRF & IFF Gates)	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Norfolk Southern HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
North Arlington HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Norton Basin HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Old Howard Beach HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Old Howard Beach East (see RRF & IFF Gates)	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Old Howard Beach West (see RRF & IFF Gates)	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Passaic Upriver HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Passaic River HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Red Hook HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Route 1 Bridge HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Roxbury HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Sheepshead Bay HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Shell - Passaic HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
S. Kearny - Passaic HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
South River HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
South Slope HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Tottenville HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Tremley HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Upper Hudson HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural
Wall Street HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Whitehead HFFRRF	NJ	From NYNJHATS Comprehensive Alternative 2	Structural

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive Alternatives, NFS, etc.))	Type of Measure
Yankee Stadium HFFRRF	NY	From NYNJHATS Comprehensive Alternative 2	Structural
Hallet's Cove (See FID)	NY	District	Structural
Hunt's Point, The Bronx	NY	District - Comments on Draft Report	Structural / Nonstructural
Coney Island Boardwalk/Berm	NY	District / City of New York	Structural / Nonstructural
Jamaica Bay SSB	NY	From NYNJHATS Comprehensive TSP	Structural
Arthur Kill SSB	NY	From NYNJHATS Comprehensive TSP	Structural
Kill Van Kull SSB	NJ	From NYNJHATS Comprehensive TSP	Structural
Gowanus SSB	NY	From NYNJHATS Comprehensive TSP	Structural
Newtown Creek SSB	NY	From NYNJHATS Comprehensive TSP	Structural
Flushing Creek SSB	NY	From NYNJHATS Comprehensive TSP	Structural
Arthur Kill Barrier Tie-In	NY	From NYNJHATS Comprehensive TSP	Structural
<b>East Harlem SBM*</b>	<b>NY</b>	<b>From NYNJHATS Comprehensive TSP</b>	<b>Structural</b>
Flushing Creek Barrier Tie-in	NY	From NYNJHATS Comprehensive TSP	Structural
Gowanus Canal Barrier Tie-in	NY	From NYNJHATS Comprehensive TSP	Structural
Jamaica Bay Barrier Tie-In 3A, 3B, & 4	NY	From NYNJHATS Comprehensive TSP	Structural
Kill Van Kull Barrier Tie-in	NY	From NYNJHATS Comprehensive TSP	Structural
Kill Van Kull Barrier Tie-in Separated	NJ	From NYNJHATS Comprehensive TSP	Structural
NJ Along Hudson River SBM	NJ	From NYNJHATS Comprehensive TSP	Structural
NYC West Side SBM	NY	From NYNJHATS Comprehensive TSP	Structural
Breezy Point IIF	NY	From NYNJHATS Comprehensive TSP	Structural
Kips Bay IIF	NY	From NYNJHATS Comprehensive TSP	Structural
Bronx IIF	NY	From NYNJHATS Comprehensive TSP	Structural

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive Alternatives, NFS, etc.))	Type of Measure
Inwood IIF	NY	From NYNJHATS Comprehensive TSP	Structural
NYC Reach 6	NY	From NYNJHATS Comprehensive TSP	Nonstructural
NYC Reach 7W	NY	From NYNJHATS Comprehensive TSP	Nonstructural
NJ Reach 8N	NJ	From NYNJHATS Comprehensive TSP	Nonstructural
NJ Reach 8S	NJ	From NYNJHATS Comprehensive TSP	Nonstructural
NJ Reach 9	NJ	From NYNJHATS Comprehensive TSP	Nonstructural
NJ Reach 11MS	NJ	From NYNJHATS Comprehensive TSP	Nonstructural
NJ Reach 11T	NJ	From NYNJHATS Comprehensive TSP	Nonstructural
NJ Reach 12	NJ	From NYNJHATS Comprehensive TSP	Nonstructural

The study team added two additional sites, that were not part of any of the existing locations pulled from alternatives in the NYNJHAT study; the Yonkers Joint Wastewater Treatment Plant (WWTP) and Sherman Creek (**Table 2**) which were both later screened out from further consideration for this effort after desktop analyses and investigations were performed. Through extensive coordination throughout the iterative exercise, the NYNJHATS team went back to the NFS with requests for existing site data, where past project plans and information was shared from the New York City Economic Development Corporation to allow the team to revisit the Harlem River Actionable Element, formerly known as the East Harlem Shore-Based Measure from the September 2022 Draft FR/Tier 1 (Programmatic) EIS.

**Table 2: Second Iteration of Potential Actionable Element Sites Considered**

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive TSP, Alternatives, NFS, etc.))	Type of Measure
Joint Wastewater Treatment Plant	NY	District	Structural
Sherman Creek	NY	District	Structural / Nonstructural

### 2.1.2 Third Iteration

Additional critical infrastructure sites were identified within the 1% Annual Exceedance Probability (AEP) floodplain using the Geographic Information System (GIS) databases and aerial imagery, for the third iteration. Due to the limitations on schedule, the team focused efforts on identifying structures associated with Emergency Medical Stations, Police, or Fire, to ensure their critical nature. At each site an estimated ground elevation was extracted and compared to 1% AEP still water level; sites were identified as possible projects if the depth of flooding was less than three feet. Sites meeting the depth screening criteria were then viewed on Google Streetview to confirm building classification and suitability for dry floodproofing. Sites passing this final desktop screening procedure were then recommended for site visits or additional information from the NFS. Similarly, the NYNJHATS team was tasked with additionally looking within the general study area for any emergency service stations or critical facilities that are more frequently flooded, with an estimated flood depth of three feet or less at 2% AEP event. Together, thirty-seven sites were identified for initial consideration (**Table 3**) and a final screening resulted in deferral of 29 of the sites from consideration for a WRDA 2026 recommendation due to conflicts with USACE policy or due to already having projects underway. Dry floodproofing of the remaining 8 sites could be otherwise addressed on a local level and does not require USACE involvement to implement. Alternatively, the NFS would be open to potentially including these sites during a later iteration of studying Actionable Elements. The sites listed within Table 3 were gathered as a result of a GIS screening conducted by the District and were later screened through team coordination and assessment. These cases were not deemed substantial measures. Alternatively, sites from the third iteration of screening could also be investigated for implementation via USACE’s Continuing Authorities Program, Section 103 for small coastal storm risk management projects, at the request of a non-Federal sponsor.

**Table 3: Third Iteration of Potential Actionable Element Sites Considered**

Site	State of Site	Origin of site (Where did it come from? (e.g., NYNJHATS Comprehensive TSP Alternatives, NFS, etc.))	Type of Measure
Edgewater First Aid Squad	NJ	District	Nonstructural
Oceanport Volunteer First Aid and Rescue Squad	NJ	District	Nonstructural
Port au Peck Chemical Hose	NJ	District	Nonstructural
Emergency Operation Center	NJ	District	Nonstructural
Belford Engine Co Station 3	NJ	District	Nonstructural
South Kearny Police Station	NJ	District	Nonstructural
River Edge Fire Department Company #2	NJ	District	Nonstructural
Fire House Company No 1	NJ	District	Nonstructural
Ridgefield Park Engine 4	NJ	District	Nonstructural

Bayonne FD Training Division	NJ	District	Nonstructural
Hackensack Fire Dept. - Engine 1	NJ	District	Nonstructural
South Hackensack FD	NJ	District	Nonstructural
Newark Fire Dept Engine 19	NJ	District	Nonstructural
FDNY Engine 279/Ladder 131	NY	District	Nonstructural
FDNY Engine 279/Ladder 131	NY	District	Nonstructural
FDNY Engine 321/Foam 87	NY	District	Nonstructural
FDNY Engine 202/Ladder 101/Bat. 32	NY	District	Nonstructural
Essex County Correctional Facility	NJ	District	Nonstructural
Secaucus Engine 3	NJ	District	Nonstructural
Port Authority Building	NY	District	Nonstructural
NYPD Facility	NY	District	Nonstructural
FDNY Engine 329	NY	District	Nonstructural
Volunteer Fire Department of Roxbury	NY	District	Nonstructural
Care Plus Medical Services	NJ	District	Nonstructural
Gerritsen Beach Fire Department	NY	District	Nonstructural
Fire Department City of New York	NY	District	Nonstructural
Middletown Township First Aid & Rescue	NJ	District	Nonstructural
Monmouth Beach First Aid Squad	NJ	District	Nonstructural
Bellevue Hospital Center	NY	District	Nonstructural
Rockaway Point Volunteer Fire	NY	District	Nonstructural
Monmouth Beach Fire Department	NJ	District	Nonstructural

Fire Department of Jersey City	NJ	District	Nonstructural
Monmouth Beach Police Department	NJ	District	Nonstructural
FDNY Engine 266	NY	District	Nonstructural
New York Police Department 100th Precinct	NY	District	Nonstructural
Midwood / InstaCare Ambulance Service	NY	District	Nonstructural
Ambulnz NY	NY	District	Nonstructural

### 2.1.3 Fourth Iteration

In another attempt to identify one or more potential projects that could achieve the appropriate design maturity for a Class 3 cost estimate by WRDA 2026, the PDT searched for sand-based projects and Nature-Based Solutions within the General Study Area. Neither sand-based projects nor Nature-Based Solutions require geotechnical investigations to reach the appropriate design maturity, as required by USACE policy. At the District's request and with the criteria shared, the NFSs proposed the following sites for consideration (**Table 4**). These sites were identified using inter-agency experience with current or past USACE study recommendations and a request for revisitation from the NFS.

**Table 4: Fourth Iteration of Potential Actionable Element Sites Considered**

Site	State of Site	Origin of site (Where did it come from? (e.g., City, State, TSP, HAT Study Alternatives))	Type of Measure
Cliffwood Beach	NJ	NFS - State of New Jersey	Nonstructural
Atlantic Highlands	NJ	NFS - State of New Jersey	Nonstructural
Leonardo	NJ	NFS - State of New Jersey	Nonstructural
Bayonne	NJ	NFS - State of New Jersey	Nonstructural
<b>East Riser*</b>	<b>NJ</b>	<b>NFS - State of New Jersey</b>	<b>Structural</b>
Idlewild Park	NY	NFS - State / City of New York	Nature-Based Solution
Jamaica Bay	NY	NFS - State / City of New York	Nature-Based Solution
<b>Oakwood Beach*</b>	<b>NY</b>	<b>NFS - State / City of New York</b>	<b>Nature-Based Solution</b>

## 2.2 RECOMMENDATION

During an extensive iterative planning process and 18 months of collaboration, the New York District held several workshops with the internal NYNJHATS team, as well as the NFS, to analyze each potential Actionable Element Site and its ability to meet the requirements of the screening criteria. Ultimately, the New York District received existing site data and prior project documentation, shared by the NFS, that allowed the study team the opportunity to investigate the Actionable Elements that are part of this Interim Response document. The following three sites were found to have significant existing data to meet the screening criteria and investigated as part of this Interim Response Report and Environmental Assessment:

- 1) East Riser Actionable Element: The District saw opportunity in further advancing the NJDEP’s proposed recommendation from the East Riser Ditch Project, as part of the State’s broader Rebuild By Design Meadowlands, based on the array of existing site data and documentation that was available without funding to construct. The New York District received 100% completed designs and a suite of project documentation, as shared by the NJDEP. It is important to note that the project documentation shared was designed to the specific standards of the State of New Jersey and percentage or quality of design may vary when considering the standards of USACE. Additionally, this Actionable Element Site most clearly utilizes Section 8106(a) of WRDA 2022 to consider the intersection of both coastal and riverine flood inputs.
- 2) Oakwood Beach Actionable Element: The NYSDEC and NYCDEP shared 100% completed designs for the Oakwood Beach Ecosystem Restoration project, as a potential candidate to consider a Nature-Based Solution (NBS), as outlined as a priority within Section 1343 of WRDA 2024. The study team used existing documentation to inform the design and advancement of the CSRМ-focused NBS Actionable Element. It is important to note that the project documentation shared was designed to the specific standards of the State of New York and percentage or quality of design may vary when considering the standards of USACE
- 3) Harlem River Actionable Element: The NYCDEP shared 100% completed designs and permits for two subprojects from the Harlem River Manhattan Greenway Project, originally prepared by the New York City Economic Development Corporation (NYCEDC). While the project, as priorly designed, did not have a CSRМ focus to manage risk from coastal flooding, New York District saw the opportunity to use existing site data (i.e., geotechnical information), to aid in the investigation and advancement of a hydrologically separable piece of the “Harlem River Shore-Based Measure”, originally part of the Comprehensive Plan TSP, Alternative 3b.

These three sites each met the screening criteria for further consideration as Actionable Elements, prior to release of the Draft Report in July 2025. More information has since been received about the documentation shared, and analyses done during a period of optimization, have informed the current recommendations, as outlined in this Final Interim Response Report. More about the District’s final recommendation and the optimization done, can be found in Section 6.4.