



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS NORTH ATLANTIC DIVISION
FORT HAMILTON MILITARY COMMUNITY
302 JOHN WARREN AVENUE
BROOKLYN NY 11252-6700

CENAD-PD-P (1105-2-10c)

MEMORANDUM FOR Commander, New England District, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751

SUBJECT: Submission of the Review Plan for the Stratford, Connecticut Coastal Storm Risk Management Feasibility Study (P2 Number 503791) for Approval

1. Reference:

a. CENAB-PLP, memorandum (subject as above), dated 11 June 2025.

b. CENAD-PD-P, memorandum, (Endorsement of the Review Plan for the Stratford, Connecticut Coastal Storm Risk Management (CSRM) Feasibility Study), 2 June 2025.

2. The National Planning Center of Expertise for Coastal Storm Risk Management (PCX-CSRM) has reviewed the review plan for the Stratford, Connecticut CSRM Feasibility Study and concurs that it complies with current peer review policy requirements contained in ER 1165-2-217, entitled "Civil Works Review Policy," and complies with the CECW memo (07 May 2025), "Feasibility Study Vertical Team Alignment and Command Validation." The Review Plan includes Independent External Peer Review (IEPR).

3. The enclosed Review Plan is approved for execution and is subject to change as study circumstances require, consistent with study development under the Project Delivery Business Process. Subsequent revisions to this Review Plan or its execution require new written approval from NAD.

4. The point of contact is Mr. R. Brian Paul, NAD Planning Program Manager at 347-622-2878 or Robert.B.Paul@usace.army.mil.

3 Encls

1. Transmittal Memo
2. PCX-CSRM Endorsement Memo
3. Stratford Feasibility Study Review Plan

JOHN P. LLOYD
Brigadier General, USA
Commanding



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

CENAB-PLP

11 June 2025

MEMORANDUM FOR Commander, North Atlantic Division, U.S. Army Corps of Engineers (CENAD-PD-C/ Robert Vohden), Fort Hamilton Military Community, 301 John Warren Ave. Brooklyn, NY 11252-6700

SUBJECT: Submission of the Review Plan for the Stratford, Connecticut Coastal Storm Risk Management Feasibility Study (P2 Number 503791) for Approval

1. Reference: Engineer Regulation 1165-2-217 – Water Resources Policies and Authorities – Civil Works Review Policy, 2 September 2024.
2. The New England District developed the enclosed Review Plan (enclosure 1) dated June 2025 for the Stratford, Connecticut Coastal Storm Risk Management Feasibility Study (Stratford CSRM Study), in accordance with ER 1165-2-217 (Reference 1a). The Review Plan has been reviewed for technical sufficiency and policy compliance by the National Planning Center of Expertise for Coastal Storm Risk Management (PCX-CSRM). The PCX's endorsement of the Review Plan is provided in the enclosed memorandum dated 2 June 2025 (enclosure 2).
3. The New England District is requesting review and approval of the enclosed Review Plan for the Stratford CSRM Study.
4. If you have any questions regarding the project review plan, please contact Luis Santiago, Lead Planner, at Luis.E.Santiago@usace.army.mil or (410)-962-6691.

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JUSTIN R. PABIS, PE
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Commanding



DEPARTMENT OF THE ARMY
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FORT HAMILTON MILITARY COMMUNITY
302 JOHN WARREN AVENUE
BROOKLYN, NY 11252-6700

CENAD-PD-P (1105-2-10c)

2 June 2025

MEMORANDUM FOR Commander, New England District, U.S. Army Corps of Engineers, (CENAE-PPM/ Samuel Bell) 696 Virginia Road, Concord, MA 01742-2718

SUBJECT: Endorsement of the Review Plan for the Stratford, Connecticut Coastal Storm Risk Management (CSRM) Feasibility Study

1. The National Planning Center of Expertise for Coastal Storm Risk Management (PCX-CSRM) has reviewed the review plan for the Stratford, Connecticut CSRM Feasibility Study and concurs that it complies with current peer review policy requirements contained in ER 1165-2-217, entitled "Civil Works Review Policy," and complies with the CECW memo (07 May 2025), "Feasibility Study Vertical Team Alignment and Command Validation."
2. Endorsement of the review plan, along with the required model user and coordination questionnaires, documents compliance with CECW-P memo (28 July 2023), "Model Coordination for Civil Works Planning Studies," to coordinate models and confirm assigned modelers possess the requisite knowledge and experience to complete modeling tasks and to ensure the feasibility study is successful.
3. The review was performed by the PCX-CSRM in coordination with representation from Headquarters Engineering & Construction - Hydrology, Hydraulics, and Coastal (HQ E&C - HH&C).
5. The PCX-CSRM has no objection to review plan approval by the North Atlantic Division (NAD).
6. The PCX-CSRM is prepared to lead the Agency Technical Review for the Stratford, Connecticut CSRM Feasibility Study and will continue to coordinate with the project delivery team. For further information, please contact me at 347-370-4591.

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DONALD E. CRESITELLO
Technical Director, PCX-CSRM

Review Plan
June 2025

1. Project Summary

Project Name: Stratford, Connecticut Coastal Storm Risk Management Feasibility Study

Location: Stratford, Connecticut

P2 Number: 503791

Decision and Environmental Compliance Document Type: Integrated Feasibility Report and Environmental Impact Statement (EIS)

Congressional Authorization Required: Yes

Project Purpose: Coastal Storm Risk Management

Non-Federal Sponsor: Town of Stratford

Points of Public Contact for Questions/Comments on Review Plan:

District: New England District

District Contact: Project Manager, (978) 318-8727

Major Subordinate Command (MSC): North Atlantic Division

MSC Contact: Planning Program Manager, (347) 622-2878

Review Management Organization (RMO): National Planning Center of Expertise for Coastal Storm Risk Management (PCX-CSRМ)

RMO Contact: Technical Director, (347) 370-4591

Key Review Plan Dates

Date of RMO Endorsement of Review Plan	2 June 2025
Date of MSC Approval of Review Plan	15 July 2025
Date of IEPR Exclusion Approval	N/A
Has the Review Plan changed since RMO Endorsement?	No
Date of Last Review Plan Revision	NONE
Date of Review Plan Web Posting	Pending

Milestone Schedule and Other Dates

	Scheduled	Actual
FCSA Execution		27 Sep 2024
Alternatives Milestone		12 Jun 2025
Tentatively Selected Plan	1 Jun 2027	
Release Draft Report to Public	30 Jul 2027	
Command Validation Milestone	21 Oct 2027	
Final Report Transmittal	8 Aug 2029	
State & Agency Briefing	30 Aug 2029	
Chief's Report	7 Dec 2029	

2. References

Engineer Regulation 1165-2-217 – Water Resources Policies and Authorities – Civil Works Review Policy, 2 September 2024.

Engineer Circular 1105-2-412 – Planning – Assuring Quality of Planning Models, 31 March 2011.

Planning Bulletin 2013-02, Subject: Assuring Quality of Planning Models (EC 1105-2-412), 31 March 2013.

Office of Management and Budget, Final Information Quality Bulletin for Peer Review, Federal Register Vol. 70, No. 10, January 14, 2005, pp 2664-267

CECW-P Memorandum, Model Coordination for Civil Works Planning Studies, 28 July 2023.

Engineer Pamphlet 1105-2-61 – Planning – Feasibility and Post-Authorization Study Procedures and Report Processing Requirements, 1 July 2023

CECW Memorandum, Subject: Vertical Team Alignment Memorandum (VTAM) Guidance, 29 July 2022

CECW Memorandum, Subject: Feasibility Study Vertical Team Alignment and Command Validation, 07 May 2025

Engineer Regulation 1105-2-102 – Water Resources Policies and Authorities – Watershed Studies – 01 April 2022

The online USACE Planning Community Toolbox provides more review reference information at: <https://planning.erdc.dren.mil/toolbox/current.cfm?Title=Peer%20Review&ThisPage=Peer&Side=No>.

3. Review Execution Plan

The general plan for executing all required independent reviews is outlined in the following two tables.

Table 1 lists each study product to be reviewed. The table provides the schedules and costs for the anticipated reviews. Teams also determine whether a site visit will be needed to support each review. The decisions about site visits are documented in the table. As the review plan is updated the team will note each review that has been completed.

Table 2 identifies the specific expertise and role required for the members of each review team. The table identifies the technical disciplines and expertise required for members of review teams. In most cases the team members will be senior professionals in their respective fields. In general, the technical disciplines identified for a District Quality Control (DQC) team will be needed for an Agency Technical Review (ATR) team. Each ATR team member will be certified to conduct ATR by their community of practice. If Independent External Peer Review (IEPR) is warranted, panel membership will reflect disciplines representing the areas of expertise applicable to the review being conducted. The table is set up to concisely identify common types of expertise that may be applicable to one or more of the reviews needed for a study.

Table 1: Schedule and Costs of Reviews

Product to undergo Review	Review Level	Site Visit	Start Date	End Date	Cost	Complete
Coastal Engineering Model – C-STORM (ADCIRC/STWAVE)	Targeted DQC	No	7/22/2026	8/11/2026	\$4,500	No
Coastal Engineering Model – C-STORM (ADCIRC/STWAVE)	Targeted ATR	No	8/12/2026	9/8/2026	\$10,000	No
Planning Model (G2CRM – Econ and EN) - FWOP	Targeted DQC	No	9/9/2026	9/29/2026	\$9,000	No
Planning Model (G2CRM – Econ and EN) - FWOP	Targeted ATR	No	9/30/2026	10/27/2026	\$10,000	No
Cost Estimation & Planning Model (G2CRM – Econ and EN) FWP Review	Targeted DQC	No	2/3/2027	2/23/2027	\$13,500	No
Cost Estimation & Planning Model (G2CRM – Econ and EN) FWP Review	Targeted ATR	No	2/24/2027	3/24/2027	\$15,000	No
Draft Feasibility Report/EIS	District Quality Control (DQC)	Yes	6/2/2027	7/27/2027	\$41,000	No
Draft Feasibility Report/EIS	Public Comment under National Environmental Policy Act	Yes	7/30/2027	9/9/2027	N/A	No
Draft Feasibility Report/EIS	Agency Technical Review (ATR)	No	7/30/2027	11/10/2027	\$57,000	No
Draft Feasibility Report/EIS	Independent External Peer Review (IEPR)	No	7/30/2027	11/17/2027	\$200,000	No
Draft Feasibility Report/EIS	Policy and Legal Compliance Review	Yes	7/30/2027	11/10/2027	N/A	No
Final Feasibility Report/EIS	DQC	N/A	6/2/2028	7/11/2028	\$40,000	No
Final Feasibility Report/EIS	ATR	N/A	9/26/2028	12/13/2028	\$60,500	No
Final Feasibility Report/EIS	Policy and Legal Compliance Review	N/A	12/14/2028	3/13/2029	N/A	No

Product to undergo Review	Review Level	Site Visit	Start Date	End Date	Cost	Complete
Final Feasibility Report/EIS	Release Final Report under National Environmental Policy Act	No	9/26/2028	3/12/2029	N/A	No
Review Management Organization – Coordination and Participation	An RMO will participate in most key meetings including In-Progress Reviews, Issue Resolution Meetings and SMART Milestone Meetings	Yes	N/A	N/A	\$10,000	No

Table 2: Review Teams - Disciplines and Expertise

Discipline / Role	Expertise	DQC	ATR	IEPR
DQC Team Lead	Extensive experience preparing Civil Works decision documents and leading DQC. The lead may serve as a DQC reviewer for a specific discipline (planning, economics, environmental, etc.).	Yes	No	No
ATR Team Lead	Professional with extensive experience preparing Civil Works decision documents and conducting ATR. Skills to manage a virtual team through an ATR. The lead may serve on the ATR team for a specific discipline (such as planning, economics, or environmental work).	No	Yes	No
IEPR Manager	Planner with extensive knowledge of IEPR policy and procedures and contract management and oversight skills.	No	No	Yes
Planning	Skilled water resources planner knowledgeable in complex planning investigations and the application of SMART principle to problem solving.	Yes	Yes	Yes
Economics	Experience with applying theory, methods and tools used in the economic evaluation of coastal storm risk management projects including expertise with Generation 2 Coastal Storm Risk Management model (G2CRM) for evaluating CSRM projects.	Yes	Yes	Yes
Environmental Resources	Experience with environmental evaluation and compliance requirements, national environmental laws and statutes, applicable Executive Orders, and other planning requirements.	Yes	Yes	Yes
Cultural Resources	Experience with cultural resource survey methods, area of potential effects, National Historic Preservation Act Section 106, and state and federal laws pertaining to American Indian Tribes.	Yes	Yes	No
Hydrology & Hydraulic/Coastal Engineering	Engineer with experience applying hydrologic principles and technical tools to project planning, design, construction, and operation. Engineer with experience applying hydraulic engineering principles and analytic tools to project planning, design, construction, and operation including expertise with ADCIRC, STWAVE, and G2CRM.	Yes	Yes	Yes
Cost Engineering	Experience using cost estimation software; working knowledge of water resource project construction; capable of making professional determinations using experience.	Yes	Yes	No
Civil Engineering	Experience with civil engineering and design for coastal storm risk management projects.	Yes	Yes	Yes
Geotechnical Engineering	Experience with geotechnical investigations and design for coastal storm risk management projects.	Yes	Yes	Yes
Construction/Operations	Extensive construction management experience and operations work.	Yes	No	No

Discipline / Role	Expertise	DQC	ATR	IEPR
Real Estate	Experience developing Real Estate Plans and experience in real estate fee/easement acquisition and residential/business relocations for Federal and/or Federally Assisted Programs for implementation of Civil Works projects.	Yes	Yes	No
Infrastructure and Installation Resilience	A member of the Infrastructure and Installation Resilience Community of Practice (IIR CoP) knowledgeable of the current policies and practice related to the consideration of changing conditions when analyzing inland and coastal hydraulics and hydrology.	Yes	Yes	No
Risk and Uncertainty	For decision documents involving hydrologic, hydraulic, and/or coastal related risk management measures, include on the ATR team an expert on multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty.	Yes	Yes	No

4. Documentation of Reviews

Documentation of DQC. Quality Control will be performed continuously. A specific certification of DQC completion will be prepared at the base conditions (existing and future), draft and final report stages. Documentation of DQC will follow the District Quality Manual and the MSC Quality Management Plan. DrChecks will be used for documentation of DQC comments. An example DQC Certification statement is provided in ER 1165-2-217, Appendix D. Documentation of completed DQC, to include the DQC checklist, will be provided to the MSC, RMO and the ATR Team leader. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort.

Documentation of ATR. DrChecks will be used to document all ATR comments, responses, and resolutions. Comments should be limited to those needed to ensure product adequacy. All members of the ATR team will use the four-part comment structure (see ER 1165-2-217, Section 5). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team to resolve using the issue resolution process in ER 1165-2-217, Section 5.9. Unresolved concerns will be closed in DrChecks by noting the concern has been elevated. ATR documentation will include an assessment by the ATR team of the effectiveness of DQC. The ATR Lead will prepare a Statement of Technical Review (see ER 1165-2-217, Section 5.11, and Appendix D), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR will be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

Documentation of IEPR. The Outside Eligible Organization will submit a final Review Report no later than 60 days after the end of the draft report public comment period. USACE shall consider all recommendations in the final Review Report and prepare a written response for all recommendations. The final decision document will summarize the Review Report and USACE response and will be posted on the internet.

5. Supporting Information

Study Background

Stratford, Connecticut Coastal Storm Risk Management (CSRM) Feasibility Study is being completed by US Army Corps of Engineers (USACE) New England District in partnership with the Town of Stratford, the non-Federal sponsor, to address flood impacts resulting from coastal inundation, erosion, and sea level change in the Town of Stratford, Connecticut. The purpose of this study is to identify economically justified, technical feasible, and environmentally acceptable alternatives to address coastal storm risk in the Town of Stratford.

Study Authority

The authorization for the study is Section 8201 of the Water Resources Development Act (WRDA) of 2022 (Public Law 117-263), which authorizes USACE to conduct a feasibility study for hurricane and storm damage risk reduction and flood risk management in Stratford, Connecticut.

Study Area & Scope

The study area includes the Town of Stratford in Fairfield County, Connecticut, which covers an area of approximately 19.6 square miles and is located on a peninsula bordered by the Town of Bridgeport and Trumbull to the west, Long Island Sound to the south, the Housatonic River and the Town of Milford to the east, and the City of Shelton to the North (see Figure 1). Stratford is a coastal town in New England of 51,384 residents (American Community Survey 2024) and is part of the Stamford-Bridgeport-Norwalk Metropolitan Area and the Housatonic River Watershed. Stratford has 14 miles of coastline along Long Island Sound and the estuary of the Housatonic River, including approximately five miles of sandy beaches. The scope of the study includes examining coastal storm risk management alternatives within the coastal extent of the Town of Stratford. The study authority includes flood risk management for riverine flooding, however, the District, in coordination with the Town of Stratford, has limited the scope of the flood risk management effort to examining flood risk management measures for Bruce Brook, which is influenced by both coastal and riverine flooding.

Problem Statement

Substantial portions of the floodplain in the coastal town of Stratford are susceptible to storm surge and wave impacts from tropical storms (hurricanes) and extra-tropical storms (nor'easters) and sea level change. Inundation from coastal storms damage structures, critical infrastructure, and roads, and impacts the safety of residents.

Some coastal storm risk problems identified include:

- Flooding of roadways, reducing access for residents and disruption to commercial/industrial facilities.
- Flooding of low-lying neighborhoods resulting in economic damages, life safety impacts, damages to vehicles, and disruption of everyday community life.
- •Debris from coastal storms impacts the effectiveness of response during and recovery following storm events.
- Sea level change would increase flood risk to low-lying areas in the next 100 years.
- Coastal storm induced riverine impacts during large events.

Study Area Map

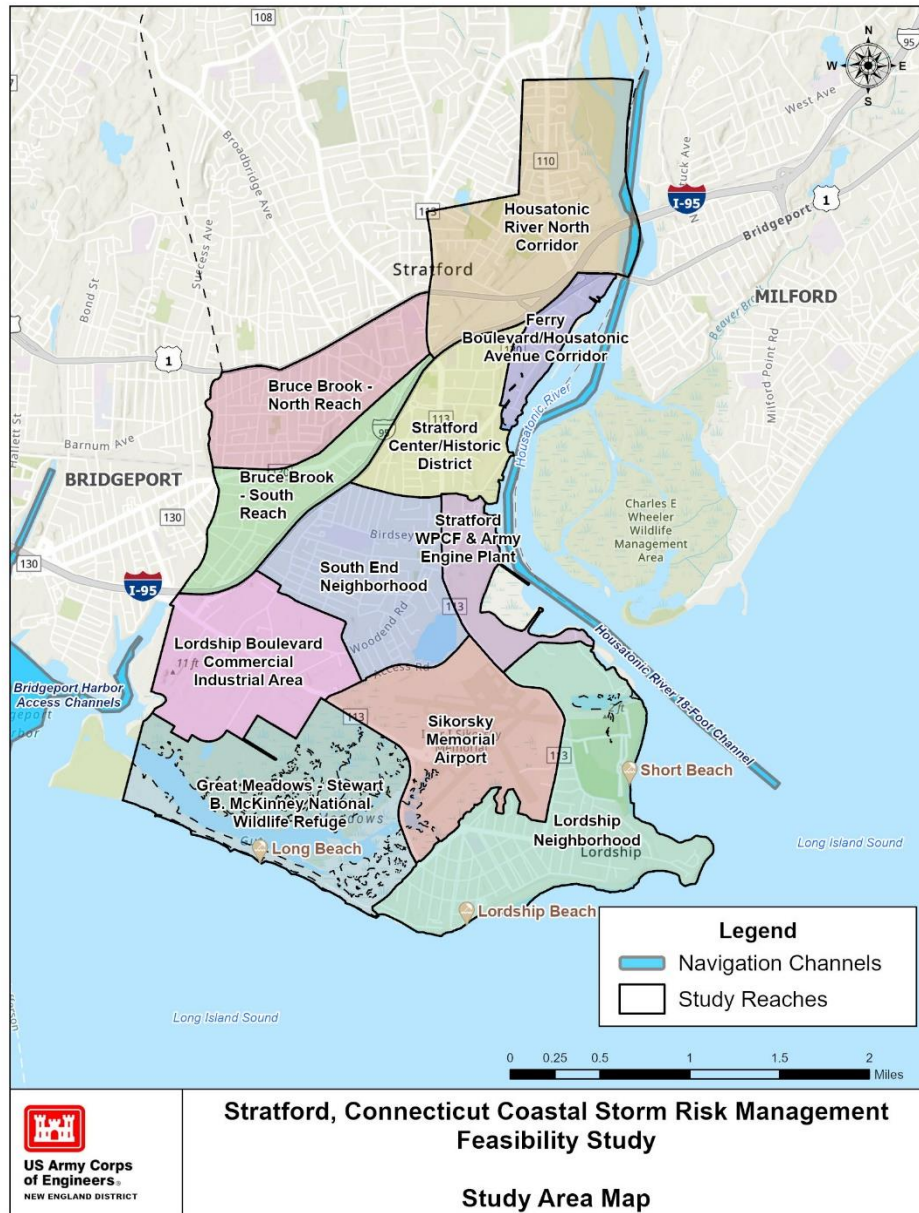


Figure 1 – Study Area Map

Opportunities exist in the study area to:

- Manage flood risk to all at risk communities.
- Enhance economic vitality to the Town of Stratford by managing flood risk and flood-related business disruption to the Lordship Commercial Industrial Area, a significant employment center for the town, and other major employers.
- Maintain or enhance open spaces and recreational features in the study area.
- Enhance the coastal identity of the Town of Stratford by pursuing opportunities that connect residents to the waterfront.
- Enhance the ecological resilience of existing wetlands and beaches, including opportunities to beneficially use suitable dredged materials from nearby navigation projects.
- Improve the resilience of critical infrastructure to coastal storm hazards including transportation infrastructure (highways, transit, school buses, multimodal), local utilities, municipal facilities, emergency services, and important regional services.

Goals and Objectives

The goal of this study is to identify economically justified, technical feasible, and environmentally acceptable alternatives to address coastal storm risk in the Town of Stratford. All objectives for this study apply to the 50-year period of analysis beginning in 2035 and ending in 2084. Measures are analyzed for resilience and adaptability over the 100-year planning horizon to 2135. The 100-year period is being considered due to potential impacts associated with sea level change in the community.

- To manage coastal storm risk to the Town of Stratford by reducing economic damages to residential, commercial, and industrial structures.
- To manage life safety risk from coastal storm hazards.
- To manage direct and indirect economic impacts from coastal flooding resulting from business disruption to commercial and industrial employers in the study area.
- To improve the resilience of the Town of Stratford's critical infrastructure to coastal storm hazards and sea level change.

Planning Constraints

Constraints are things that alternatives should avoid to reach the desired outcome. Constraints identified for this study include:

- Avoid impacts to superfund sites (Raymark).

Planning Considerations

Planning considerations for this study include:

- Minimize impacts to hazardous, radioactive and toxic waste (HTRW) and brownfield sites in the study area.
- Avoid or minimize project features that require high-cost facility and utility relocations.
- Avoid or mitigate impacts to all at risk communities.
- Minimize impacts to existing transportation infrastructure (roads, rail and bus transit, airport).
- Minimize impacts to railroads and railroad property.
- Avoid or mitigate impacts to wetlands in the study area.
- Avoid or minimize induced flooding impacts.
- Minimize impacts to healthy, mature trees in the study area.

Future Without Project Conditions

The future without project (FWOP) conditions are currently being developed. The following assumptions are included as part of the FWOP condition:

- The Stratford Army Engine Plant will be remediated and re-developed with planned industrial redevelopment being raised above the FEMA base flood elevation (BFE) estimated to be elevation +14ft in the North American Vertical Datum of 1988 (NAVD88).
- The Stratford Water Pollution Control Facility floodwall will be raised above the BFE to elevation +17ft NAVD88.
- The Town of Stratford will raise Broad Street to elevation +11ft NAVD88 and include a tidal gate to address flooding to businesses located along Ferry Creek.
- The Great Meadows Unit of the Stewart B. McKinney Wildlife Refuge will continue to be impacted by coastal storm risk and sea level change. The recent marsh resiliency project extended high marsh habitat, which would allow low marsh migration in the future.
- Stratford Point living shoreline implemented to address erosion and improve nearshore habitat.
- Sea level change under most SLC scenarios will result in significant sunny day flooding in portions of the study area over the 100-year planning horizon including substantial portions of the South End Neighborhood, low-lying parts of the Lordship Neighborhood, the Lordship Boulevard Commercial Industrial Area, and low-lying areas along the Housatonic River.

Types of Measures/Alternatives Being Considered

This study will consider typical coastal storm risk management measures to address the coastal hazards identified in this review plan. An array of structural, nonstructural, and nature-based solutions will be examined to address coastal storm risk objectives and may include a combination of measures listed below.

Structural Measures

Levees/setback levees
Floodwalls/Seawalls/buried seawalls
Surge barriers
Tidal gates
Elevated road berm (road raising)
Pump stations for interior drainage
Beach fill and dunes*
*Measure is also a nature-based solution

Nonstructural Measures

Elevation
Floodproofing (wet and dry)
Buyouts (acquisition or relocation)

Nature-Based Solutions

Wetland restoration
Living shoreline

Programmatic Measures

Evacuation Systems
Flood Warning Systems
Building Code updates
Public Education

Note that revetments, bulkheads, groins, and breakwaters exist all along the Stratford shoreline and no opportunities for siting these measures were identified that would address planning objectives during the planning workshop or charette. These measures were screened from further analysis in the study as they would not meet planning objectives. Programmatic measures are applicable to all alternatives and will be considered as needed to meet planning objectives.

Initial Array of Alternatives

Alternative Plan Name	Measures
No Action	See FWOP Conditions
1 – Stratford Perimeter Barrier Plan	This plan consists of outer perimeter features around the Town of Stratford to include risk management to most damage areas including levees, floodwalls/seawalls, elevated road berms, beach fill and dunes, and a surge barrier. Nonstructural measures are included to address risk in areas outside of the perimeter including elevation of residential and commercial structures and floodproofing of commercial and industrial structures.
2 – Economic Damage Centers Plan	This plan consists structural measures to address risk to the economic damage centers of South End Neighborhood and Lordship Boulevard Commercial Industrial Area and includes floodwalls, elevated road berms, and tidal gates. Nonstructural measures are included to address risk in Lordship neighborhood, Sikorsky Memorial Airport and along the Housatonic River including elevation and floodproofing of structures. Phased acquisition of structures is also a proposed measure for structures along the shoreline in Lordship neighborhood, which will be severely degraded under the FWOP condition due to sea level change.
3 – Nature Based Solutions Plan	This plan combines nature-based solutions emphasized during the planning charette with traditional CSRM measures. The purpose of this plan is to enhance the existing wetland at Great Meadows while providing CSRM to the South End neighborhood and Lordship Boulevard Commercial Industrial Area. The CSRM features include levees/levee setbacks, floodwalls, elevated road berms, and tidal gates. Similar to Alternative 2, nonstructural measures are proposed in Lordship neighborhood and along the Housatonic River. This plan consists of acquiring Sikorsky Memorial Airport by the Town of Stratford and restoration of portions of the airport as floodplain features including wetland restoration, remediation of HTRW sites, and recreation features as actions by others. This plan would also remove elevation restrictions associated with flight zones that would impact proposed CSRM features.
4 – Adaptation Core and Coastal Retreat Plan	This plan includes a core adaptation zone where risk is managed by continuous line of structural measures consisting of elevated road berm, floodwalls, and tidal gates. Nonstructural measures are used outside of the core zone to accommodate or retreat from the coastal hazard, which will be exacerbated by sea level change in the future, including elevation and floodproofing of structures, and phased buyouts along the shoreline in Lordship neighborhood.
5 - Resilient Stratford Plan	This plan was proposed in the Resilient Stratford South End Plan (2023) and consists of levees/setback levees, floodwalls, elevated road berms with floodwalls, tidal gates, and limited wetland restoration features to manage risk to much of the developed portions of Stratford including South End Neighborhood, Sikorsky Memorial Airport, and Lordship Boulevard Commercial Industrial Area. Nonstructural measures are included to address risk in Lordship neighborhood and along the Housatonic River.

Estimated Cost/Range of Costs

The array or cost of all alternative plans have not been generated at this time. The Town of Stratford's Resilience Stratford South End Plan including the evaluation of a conceptual design for a perimeter risk management plan that is estimated at \$297 million dollars that will be examined in this feasibility study therefore alternatives are likely to exceed \$200 million.

The complexity associated with coastal storm and riverine flooding impacts in addition to sea level change in the study area is indicative of a complex hydrology and hydraulic modeling effort which is likely to exceed the 3x3x3 requirements of SMART Planning (33 USC 2282c). As such, this study is anticipated to require an additional resource request for an increase in schedule and budget due to the scope and complexity of modeling associated with the study.

6. Models to be Used in the Study

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are any models and analytical tools used to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making.

The following planning models may be used to develop the decision document:

Table 3: Planning Models, Tools and Data

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification/ Approval
G2CRM 0.4.564.3	Generation II Coastal Risk Model (G2CRM) is a desktop computer model oriented specifically toward analysis of coastal storm risk management systems in a risk-based life cycle context. It is a desktop computer model that implements an object-oriented probabilistic life cycle analysis model using event-driven Monte Carlo simulation. G2CRM will be used as the primary economic model to evaluate and compare the existing conditions, future without conditions, and future with-project alternative plans.	Certified
RECONS 2.0	The Regional Economic Systems (RECONS) model is a regional economic impact modeling tool developed by the USACE Institute for Water Resources (IWR) to provide estimates of regional economic impacts associated with Federal expenditures. This modeling tool automates calculations and generates estimates of jobs and other economic measures such as income and sales associated with USACE spending on Civil Works programs and projects. RECONS will be used to estimate the regional economic impact of alternatives.	Certified
Expected Annual Damages (EAD) Tool – GIS-based Python Script developed by Paul Morelli	The EAD Tool is a simple damage calculation model developed using python script in GIS to determine preliminary federal interest in a project. The tool uses water surface elevations, a structure inventory, and damage functions to estimate EADs for a range of storm frequencies. The tool is used to identify federal interest in the project at the AMM.	Not Certified for Use

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. For example, HH&C models need to comply with the requirements of HH&C CoP Enterprise Standard 08101.

These engineering models may be used to develop the decision document:

Table 4: Engineering Models, Tools and Data

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
Microcomputer Aided Cost Engineering System (MCACES) 2 nd Generation (MII)	The MCACES MII construction cost estimating software, developed by Building Systems Design, Inc., is a tool used by cost engineers to develop and prepare all USACE Civil Works cost estimates. Using the features in this system, cost estimates are prepared uniformly allowing cost engineering throughout USACE to function as one virtual cost engineering team.	Cost Engineering MCX Required Model
Crystal Ball	Per ECB No. 2007-17, cost risk analysis methods will be used for the development of contingency for the total project cost estimate. Crystal Ball software is approved for use to conduct the total project cost and schedule risk analysis.	Cost Engineering MCX Approved for use
CHS-NACCS	The Coastal Hazards System (CHS) is a national coastal storm hazard data resource for probabilistic coastal hazard assessment (PCHA) results and statistics, storing numerical and probabilistic modeling results including storm surge, astronomical tide, waves, currents, and wind. CHS is an up-to-date and easily accessible environment for development, storage, and rapid access to PCHA hazard results, additional information such as tides, wind and rainfall, and documentation of the results. Based on high-resolution numerical modeling of coastal storms spanning practical probability and forcing-parameters, PCHA results directly support probabilistic design or risk assessment. The North Atlantic Coast Comprehensive Study (NACCS) included coastal storm hazards from Virginia to Maine.	HH&C CoP Preferred
CSTORM-MS Coupler – Version 1.1	CSTORM-MS is an integrated system of fully coupled coastal process modeling tools. CSTORM-MS links the simulation of winds, water levels, waves, and currents during extreme events by coupling the ADCIRC and STWAVE models. The computational coupler employs a two-way coupling scheme that not only enhances the represented physics but also results in significant improvements in computational time when compared to file-based approaches.	HH&C CoP Preferred
Advanced Circulation Model (ADCIRC) - Version 56	This finite element, numerical model is used to simulate depth averaged hydrodynamics of coastal water bodies. ADCIRC can be forced with astronomical tidal constituents, atmospheric wind and pressure fields, wave induced radiation stresses, and river discharge. It will be used to compute the flow fields associated with tides and storm conditions for with and without project conditions. The ADCIRC modeling effort represents the primary forcing for all subsequent modeling applications and builds off the NACCS. ADCIRC will be used with STWAVE to conduct coastal modeling and evaluate the future with project conditions in the study.	HH&C CoP Preferred Model
Steady State Spectral Wave (STWAVE) - Version 6.2	This steady state wave model will be used to simulate regional wave conditions. Forced with wind fields and/or an offshore wave spectrum, the model will compute wave transmission to the project site accounting for processes like directional spreading, refraction	HH&C CoP Preferred Model

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
	and breaking. STWave output at selected locations are used to force higher resolution wave models such as CMSWave or MIKE21.	
HEC-RAS 6.6	The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. USACE has an existing HEC-RAS model for the Housatonic River that will be used to conduct riverine sensitivity analyses and if needed, conduct correlation analysis and unsteady flow analysis. The Town of Stratford will provide a HEC-RAS model to be used to evaluate flood risk management measures along Bruce Brook, a small tributary that contributes to coastal and riverine storm risk.	HH&C CoP Preferred Model
HEC-HMS 4.12	HEC's Hydrologic Modeling System (HMS) is used to simulate hydrologic processes in watersheds. HEC-HMS may be used to estimate flows for areas not covered by the PCSWMM model area and areas impacted by riverine flows.	HH&C CoP Preferred Model
HEC-SSP 2.3	The Hydrologic Engineering Center's Statistical Software Package (HEC-SSP) is used to perform statistical analysis on hydrologic data.	Allowed for Use
PCSWMM 7.7.3910	Personal Computer Storm Water Management Model will be used for interior drainage analysis of the recommended plan if it is a structural plan.	Allowed for Use

All civil works planning studies must document compliance with CECW-P memo (28 July 2023), Model Coordination for Civil Works Planning Studies, to coordinate models and confirm assigned modelers possess the requisite knowledge and experience to complete modeling tasks. A questionnaire for each model is attached in Appendix G.

7. Factors Affecting Level and Scope of Review

All planning products are subject to the conduct and completion of District Quality Control. Most planning products are subject to Agency Technical Review and a smaller sub-set of products may be subject to Independent External Peer Review and/or Safety Assurance Review. Information in this section helps in the scoping of reviews through the considerations of various potential risks.

Objectives of the Reviews

The DQC, ATR, IEPR, and Policy and Legal Compliance (P&LC) Review are further described in Appendix A. The objectives of the DQC, ATR, IEPR, and the P&LC Review are to:

1. Ensure the quality and completeness of all study products and decision document.
2. Ensure decision document is compliant with federal laws and policies including NEPA, as well as USACE policies and plan formulation standards for coastal storm risk management feasibility studies.
3. Ensure sound assumptions, modeling and analyses methods, feasibility-level design, and plan formulation methods were utilized to develop the recommended measures/alternatives and appropriately documented in the decision document and supporting appendices.
4. Ensure external coordination with the non-Federal Sponsor, stakeholders, environmental resource agencies, and public throughout the study are appropriately documented in the decision document.

Assessing the Need for IEPR

Mandatory IEPR Triggers

- Has the Chief of Engineers determined the project is controversial?
No, the Chief of Engineers has not determined that the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project.
- Has the Governor of an affected state requested an IEPR?
No, the Governor of Connecticut has not requested a peer review by independent experts.
- Is the cost of the project more than \$200 million?
Yes, the Town of Stratford's Resilience Stratford South End Plan includes the evaluation of a conceptual design for a perimeter risk management plan that is estimated at \$297 million dollars that will be examined in this feasibility study, therefore alternative are likely to exceed \$200 million.

Discretionary IEPR

- Has the head of another Federal agency requested an IEPR?
No, the head of another Federal agency has not requested an IEPR.

Potential IEPR Exclusion

- Is the project cost greater than \$200 million?
Yes, the project is likely to exceed \$200 million.
- Does the project have an Environmental Impact Statement (EIS)?
Yes. An EIS is likely to be prepared for proposed alternatives being examined in the study due to the scope and complexity of proposed measures and potential controversy with proposed alternatives.

Since the answers to both questions are Yes, IEPR is required.

Assessing Other Risk Considerations

- Will the study likely be challenging? If so, describe how?
The study is likely to be challenging as it will include an evaluation of multiple sources of risk from coastal hazards and may include complex coastal storm modeling, riverine modeling, and coastal erosion modeling. Additionally, the study will require an evaluation of different sea level change scenarios and risk assessments for alternative plans with potential life safety impacts.
- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.
The anticipated project risks are associated with engineering modeling that will be needed to assess existing and future without/with project conditions for the study area. There is a potential for three different models to assess coastal hazards and address identified problems in the study area. The engineering models will require additional time prior to the Tentatively Selected Plan (TSP) (approximately 2 -years from the Alternative Milestone) to adequately develop and run models to evaluate with-project conditions for alternative plans. These same models will also be a significant cost driver as they will require resources beyond the baseline \$3.2 million study budget. Additional risks include issues with potential real estate acquisition for proposed alternative plans including existing federal land ownership at the National Wildlife Refuge and by the City of Bridgeport at Sikorsky Regional Airport. These real estate concerns are likely to substantially impact the project

schedule due to the need for coordination with property owners and to coordinate viable alternative siting locations for alternative plans. The Town of Stratford and surrounding areas also include significant areas with known contamination by hazardous, toxic, radioactive waste (HTRW) material that would impact the design and implementation of proposed alternatives including at the Stratford Army Engine Plant, the Raymark site, and other sites along the Housatonic River with previous industrial activity.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? Briefly describe the life risk, including the District Chief of Engineering's assessment as to whether there is a significant threat to human life associated with aspects of the study or failure of the project or proposed projects.

Based on the preliminary analysis performed, Town of Stratford experiences life safety risk due to coastal storms. A majority of the town to the south of Interstate 95 consists of densely populated residential and commercial zones. These areas experience dangerous levels of inundation, one recent example being Hurricane Sandy. The PDT will utilize the principles in Planning Bulletin 2019-04 to help develop alternatives and measures that could reduce risk relative to Tolerable Risk Guidelines 1 and 4. The team will perform a baseline screening level life safety risk assessment in order to understand the future without project life safety risk. This is critical for Stratford CSRA due to the presence of existing flood risk management structures that currently act as part of a larger CSRM system. The team will use the baseline risk assessment as a tool to help in the development of measures and alternatives, and to measure the impact to life safety risk that alternatives and measures would pose.

- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? If so, how?

No, the decision document or anticipated project design is not likely to be based on novel methods, innovative materials or techniques, or present complex challenges, or precedent setting models or conclusions.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? If so, how?

The project may require consideration for redundancy, resiliency and robustness and will include formulation for resiliency features for critical infrastructure assets and the various study reaches. There is the potential for overlapping design and construction schedule for a perimeter risk management alternative that will require concurrent implementation at multiple locations.

- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? If so, what are the anticipated impacts?

No. The Town of Stratford is developed and there are existing surveys and information to document the location of historic, tribal, and cultural resources in the study area.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? If so, describe the impacts?

No. The project is not expected to have substantial adverse impacts on fish and wildlife species. ‘

- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? If so, what are the anticipated impacts?

No. The project is not expected to have more than a negligible adverse impact on endangered or threatened species.

8. Risk Informed Decisions on Level and Scope of Review

Targeted ATR. Will a targeted ATR be conducted for the study? Yes. Targeted ATR is being recommended for hydrology and hydraulic modeling and economic modeling prior to the Tentatively Selected Plan (TSP) milestone to reduce uncertainty with associated decisions. The costs of the targeted ATR are included in this plan.

IEPR Decision. Based on ER 1165-2-217 requirements analyzed in reference c, an IEPR is required for the Stratford CSRSM study because the construction costs for at least one of the project alternatives exceeds the \$200 million threshold and an EIS is being performed. Additionally, although only a discretionary criteria for conducting an IEPR, the District Chief of Engineering has made a risk-informed decision to recommend an IEPR for this study due to the potential risk to life safety. Since a plan has not been selected, the risk informed assessment of the significant threat to human life may be revisited once the TSP is identified.

Safety Assurance Review. Safety Assurance Reviews are managed outside of the USACE and are conducted on design and construction products for hurricane, storm and flood risk management projects, or other projects where existing and potential hazards pose a significant threat to human life. In some cases, significant life safety considerations may be relevant to planning decisions. These cases may warrant the development of relevant charge questions for consideration during reviews such as ATR or IEPR. In addition, if the characteristics of the recommended plan warrant a Safety Assurance Review, a panel will be convened to review the design and construction activities on a regular schedule before construction begins and until construction activities are completed.

Decision on Safety Assurance Review. The District has not made a determination on whether to conduct safety assurance review at this time. The decision to conduct a safety assurance review will be reevaluated in the Pre-construction Engineering and Design (PED) phase.

9. Policy and Legal Compliance Review

Policy and legal compliance review of draft and final planning decision documents are the responsibility of the study approval authority (see EP 1105-2-61), currently delegated to the MSC. As this study is seeking a Section 1001 policy exception for additional resources, to be granted by the Assistant Secretary of the Army for Civil Works (ASA(CW)), study approval authority will return to Headquarters (HQUSACE) upon approval of the request.

(i) Policy Review.

The policy review team is identified through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The makeup of the Policy

Review team will be drawn from HQUSACE, the MSC, the Planning Centers of Expertise, and other review resources as needed.

- The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.
- The input from the Policy Review team should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.
- Teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

(ii) Legal Review.

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

- In some cases, legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.

Each participating Office of Counsel will determine how to document legal review input.

10. Vertical Alignment Memo

The Vertical Team Alignment Memo (VTAM) is established in the CECW Memorandum, Subject: “Vertical Team Alignment Memorandum Guidance”, 29 July 2022, clarified in CECW Memorandum, Subject: “Feasibility Study Vertical Team Alignment and Command Validation,” 07 May 2025, and procedurally documented in EP 1105-2-61, “Feasibility and Post-Authorization Study Procedures and Report Processing Requirements,” 1 July 2023.

The VTAM is to ensure development of an adequate study scope, establish a realistic schedule and budget early in the study process, and actively manage towards achieving the schedule and budget. The VTAM establishes alignment on study path forward and either verifies the study is within 3x3x3 requirements or explains the need and path ahead for a policy exception request (Additional Resource Request).

Timelines for initial VTAM submission:

- The initial VTAM for the entire study schedule and funding stream for feasibility studies, limited reevaluation studies, and general reevaluation studies will be signed and transmitted to Headquarters within 60 days of the Alternatives Milestone Meeting. If the study's

Alternatives Milestone Meeting is delayed beyond nine months of study initiation, the planned milestone date will be communicated to the Headquarters Chief of the Office of Water Project Review (OWPR).

- o The initial VTAM for the entire study schedule and funding stream for validation studies will be signed and transmitted to Headquarters within 120 days of the study initiation.
- o The initial VTAM for the entire study schedule and funding stream for watershed studies will be signed and transmitted to Headquarters within six months of the study initiation (ER 1105-2-102).
- o If the VTAM will be transmitted later than the timelines above, the District Planning Chief will notify the Headquarters Chief of OWPR of the delay as soon as practicable. In no cases will VTAM submittals be delayed more than 30 days beyond the timelines above.

11. Public Comment

This Review Plan will be posted on the District's website. Public comments on the scope of reviews, technical disciplines involved, schedules and other considerations may be submitted to the District for consideration. If the comments result in a change to the Review Plan, an updated plan will be posted on the District's website.

12. Documents Distributed Outside the Government

For information distributed for review to non-governmental organizations, the following disclaimer shall be placed on documents:

“This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It has not been formally disseminated by USACE. It does not represent and should not be construed to represent any agency determination or policy.”

Appendix A - Brief Description of Each Type of Review

This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

District Quality Control. All decision documents and accompanying components will undergo DQC. This internal review covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan. The DQC team will read all reports and appendices. The review must evaluate the correct application of methods, validity of assumptions, adequacy of basic data, correctness of calculations (error-free), completeness of documentation, and compliance with guidance and standards. Districts are required to check all computations and graphics by having the reviewer place a highlight (e.g., place a “red dot”) on each annotation and/or number indicating concurrence with the correctness of the information shown.

Agency Technical Review. ATR will be performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC.

Independent External Peer Review. IEPR is required for this decision document. This is the most independent level of review and is applied in cases that meet criteria where the risk and magnitude of the project are such that a critical examination by a qualified team outside of USACE is warranted. Certain criteria dictate mandatory performance of IEPR and other considerations may lead to a discretionary decision to perform IEPR. For this study, a risk-informed decision has been made that IEPR is appropriate. The information in Section 1 – Factors Affecting the Scope of Review – informed the decision to conduct IEPR.

Cost Engineering Review. All decision documents will be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX assisted in determining the expertise needed on the ATR and IEPR teams. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews occur as part of ATR.

Policy and Legal Compliance Review. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander.

Public Review. The District will post the Review Plan and approval memo on the District’s internet site. Public comment on the adequacy of the Review Plans will be accepted and considered. Additional public review will occur when the report and environmental compliance document(s) are released for public and agency comment.



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

CENAE-ED

2 April 2025

MEMORANDUM FOR RECORD

FOR Chief of Engineering, US Army Corps of Engineers, New England District

SUBJECT: Stratford, Connecticut Coastal Storm Risk Management (CSRM) Feasibility Study
Independent External Peer Review (IEPR) - Risk Informed Assessment of Significant Threat to
Human Life

1. REFERENCES.

- a. ER1165-2-217, Civil Works Review Policy
- b. PR 2019-04, Incorporating Life Safety into Flood and Coastal Storm Risk Management Studies
- c. Independent External Peer Review Requirement Assessment – Stratford, Connecticut Coastal Storm Risk Management Feasibility Study

2. PURPOSE. The purpose of this memorandum is to document the decision on implementation of an IEPR for Stratford CSRM.

3. DETERMINATION: Based on the ER 1165-2-217 requirements analyzed in reference c, an IEPR is required for the Stratford CSRM study. Since a plan has not been selected, the risk informed assessment of the significant threat to human life, which drives the requirement to perform an IEPR, may be revisited once the tentatively selected plan is identified.

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DAVID R. MARGOLIS, PE
Chief of Engineering

Independent External Peer Review Requirement Assessment – Stratford, Connecticut Coastal Storm Risk Management Feasibility Study

1. ASSESSING THE NEED FOR IEPR. In utilizing the IEPR decision flowchart found in ER 1165-2-217, the following are the mandatory IEPR triggers:

- Is the estimated total project cost, including mitigation, greater than \$200 million?

Yes, the Town of Stratford's *Resilience Stratford South End Plan* includes the evaluation of a conceptual design for a perimeter protection plan that is estimated at \$297 million dollars that will be examined in this feasibility study, therefore alternatives are likely to exceed \$200 million.

- Has the Governor of an affected state requested a peer review by independent experts?

No, the Governor of Connecticut has not requested a peer review by independent experts.

- Has the Chief of Engineers determined the project study is controversial due to significant public dispute over the size, nature or effects of the project or the economic or environmental costs or benefits of the project (including but not limited to projects requiring an Environmental Impact Statement)?

No, the Chief of Engineers has not determined that the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project.

The following are the discretionary IEPR Triggers:

- Has the head of another Federal agency requested an IEPR?

No, the head of another Federal agency has not requested an IEPR.

Other considerations:

- Does the project have an Environmental Impact Statement (EIS)?

An EIS is likely to be prepared for proposed alternatives being examined in the study due to the scope and complexity of proposed measures and potential controversy with proposed alternatives.

2. ASSESSING OTHER RISK FACTORS

- Will the study likely be challenging? If so, describe how.

The study is likely to be challenging as it will include an evaluation of multiple sources of risk from coastal hazards and may include complex coastal storm modeling, riverine modeling, and coastal erosion modeling. Additionally, the study will require an evaluation of different sea level change scenarios and risk assessments for alternative plans with potential life safety impacts.

- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.

The anticipated project risks are associated with engineering modeling that will be needed to assess existing and future without/with project conditions for the study area. There is a potential for three different models to assess coastal hazards and address identified problems in the study area. The engineering models will require additional time prior to the Tentatively Selected Plan (TSP) (approximately 2-years from the Alternative Milestone) to adequately develop and run models to evaluate with-project conditions for alternative plans. These same models will also be a significant study cost driver as they will require resources beyond the baseline \$3.2 million study budget. Additional risks include issues with potential real estate acquisition for proposed alternative plans including existing federal land ownership at the National Wildlife Refuge and by the City of Bridgeport at Sikorsky Regional Airport. These real estate concerns are likely to substantially impact the project schedule due to the need for coordination with property owners and to coordinate viable alternative siting locations for alternative plans. The Town of Stratford and surrounding areas also include significant areas with known contamination by hazardous, toxic, radioactive waste (HTRW) material that would impact the design and implementation of proposed alternatives including at the Stratford Army Engine Plant, the Raymark site, and other sites along the Housatonic River with previous industrial activity.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues? Briefly describe the life risk, including the District Chief of Engineering's assessment as to whether there is a significant threat to human life associated with aspects of the study or failure of the project or proposed projects.

Based on the preliminary analysis performed, Town of Stratford is under life safety risk due to coastal storms. Majority of the town to the south of Interstate 95 consists of densely populated residential and commercial zones. These areas experience dangerous levels of inundation, one recent example being Hurricane Sandy.

The PDT will utilize the principles in Planning Bulletin 2019-04 to help develop alternatives and measures that could reduce risk relative to Tolerable Risk Guidelines 1 and 4. The team will perform a baseline screening level life safety risk assessment in order to understand the future without project life safety risk. This is critical for Stratford CSRA due to the presence of existing flood risk management structures that currently act as part of a larger CSRM system. The team will use the baseline risk assessment as a tool to help in the development of measures and alternatives, and to measure the impact to life safety risk that alternatives and measures would pose.

- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? If so, how?

No, the decision document or anticipated project design is not likely to be based on novel methods, innovative materials or techniques, or present complex challenges, or precedent setting models or conclusions.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule? If so, how?

The project may require consideration for redundancy, resiliency and robustness and will include formulation for resiliency features for critical infrastructure assets and the various study reaches. There is the potential for overlapping design and construction schedule for a perimeter protection alternative that will require concurrent implementation at multiple locations.

- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources? If so, what are the anticipated impacts?

No. The town is developed and there are existing surveys and information to document the location of historic, tribal, and cultural resources in the study area.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures? If so, describe the impacts?

No. The project is not expected to have substantial adverse impacts on fish and wildlife species.

- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat? If so, what are the anticipated impacts?

No. The project is not expected to have more than a negligible adverse impact on endangered or threatened species.

3. RECOMMENDATION – Given that one of the project alternative construction cost exceeds the \$200 million threshold and considering the potential risks to life safety, it is recommended to conduct an Independent External Peer Review (IEPR)

The POC for this assessment is the Engineering Technical Lead, Hande McCaw.