DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

DAEN

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SUBJECT: Lynnhaven River Basin Ecosystem Restoration Project, Virginia

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on ecosystem restoration in the Lynnhaven River Basin, Virginia. It is accompanied by the report of the district and division engineers. These reports are an interim response to a resolution by the Committee on Transportation and Infrastructure of the United States House of Representatives, Docket 2558, adopted May 1998. The resolution requested the review of the report of the Chief of Engineers on the Lynnhaven Inlet, Bay, and Connecting Waters, Virginia, published as House Document 580, 80th Congress, 2nd Session, and other pertinent reports to determine whether any modifications of the recommendations contained therein are advisable at the present time in the interest of environmental restoration and protection and other related water resources purposes for the Lynnhaven River Basin, Virginia. Preconstruction, engineering, and design activities for the Lynnhaven River Basin Ecosystem Restoration Project will continue under the authority provided by the resolution cited above.

2. The Lynnhaven River Basin, the southernmost tributary to the Chesapeake Bay in Virginia, is a 64 square mile tidal estuary in the lower Chesapeake Bay Watershed. The Lynnhaven River's three branches, the Eastern, Western, and the Broad Bay/Linkhorn Bay, represent approximately 0.4 percent of the area of Virginia and approximately 0.2 percent of the Chesapeake Bay Watershed. However, the basin encompasses one-fourth of the area of the city of Virginia Beach and provides vital functions to the city and its residents. As has happened throughout the Chesapeake Bay, the Lynnhaven River Basin has seen declines in essential habitat - submerged aquatic vegetation (SAV), wetlands, oysters and scallops - and an overall reduced water quality from alterations to the ecosystem primarily stemming from increased development and population.

3. The significance of this ecosystem is demonstrated on the national, regional, and local level. Five federal and state endangered species occur or potentially occur in the Lynnhaven River Basin, including the hawksbill, Kemp's Ridley and leatherback sea turtles and the roseate tern. Also within the basin there are four additional state endangered species to include the eastern chicken turtle, Wilson's plover, Rafinesque's big-eared bat, and the canebrake rattlesnake. The Lynnhaven River Basin includes essential fish habitats for 19 species of fin fish, which demonstrates the important of estuaries as rearing grounds not only for fin fish sought by commercial and recreational fishermen, but for shell fish as well. During 2012, more than 149,000 pounds of fin fish, 369,000 pounds of blue crabs, 2,400 pounds of conch and 18,500 pounds of hard shell clams were landed in the Lynnhaven River Basin with an approximate value

of $1 million. In 1983, 1987 and 2000, the states of Virginia, Maryland, and Pennsylvania, the District of Columbia, the Chesapeake Bay Commission, and the U.S. Environmental Protection Agency (EPA), representing the federal government, signed historic agreements establishing the Chesapeake Bay Program, a strong partnership to protect and restore the Chesapeake Bay ecosystem. In addition, Section 704(b) of the Water Resources Development Act (WRDA) of 1986, as amended through Section 505 of the WRDA of 1996; the re-authorization of Section 704(b); Section 342 of the WRDA of 2000; and the Section 704(b) as amended by Section 5021 of WRDA 2007 provided for the restoration of oysters within the Chesapeake Bay and its tributaries. Recently, all of the laws and agreements affecting the restoration, protection, and conservation of the Chesapeake Bay have been brought into focus under the Chesapeake Bay Protection and Restoration Executive Order (EO 13508) signed by President Barack Obama on 12 May 2009. Locally, the city of Virginia Beach, The Trust for Public Land, and the Chesapeake Bay Foundation have partnered to purchase and protect 122 acres of natural lands known as Pleasure House Point, one of the largest undeveloped tracts of land on the Lynnhaven River.

4. The reporting officers recommend authorization of a plan to restore approximately 38 acres of wetlands, 94 acres of SAV, reintroduction of the bay scallop on 22 acres of the restored SAV, and construction of 31 acres of artificial reef habitat. The restoration measures, at various sites throughout the basin, will significantly increase three types of habitats, at least two of which are an essential part of the food web for several of the endangered species and form the basis of many of the essential fish habitats. The recommended plan is the National Ecosystem Restoration (NER) Plan. Implementation of the recommended plan will have substantial beneficial impact on the biological integrity, habitat diversity, and resiliency of the Lynnhaven River Basin.

5. Based on an October 2013 FY14 price level, the estimated project first cost of the NER Plan is $35,110,000, which includes a 10-year monitoring and adaptive management program at an estimated cost of $1,750,000, developed to adequately address the uncertainties inherent in a large environmental restoration project and to improve the overall performance of the project. In accordance with the cost sharing provisions contained in Section 103(c) of the WRDA 1986, as amended (33 U.S.C. 2213(c)), ecosystem restoration features are cost-shared at a rate of 65 percent federal and 35 percent non-federal. Thus the federal share of the project first cost is $22,821,500 and the non-federal share is estimated at $12,288,500, which includes the costs of land, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRD) estimated at $740,000. The non-federal sponsor will receive credit for the costs of LERRD toward the non-federal share. The City of Virginia Beach is the non-federal cost-sharing sponsor for the recommended plan. The city would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction, an average annual cost currently estimated at $2,000.

6. Based on a 3.5 percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be $1,554,000, including monitoring estimated at $30,000 and $2,000 for OMRR&R. All project costs are allocated to the authorized purpose of ecosystem restoration and are justified by an increase in species diversity (measured

using a biological index), an increase in secondary production, and an increase in marsh productivity (an average increase of 70 points using the EPA Marsh Assessment Score). The plan would improve essential estuarine habitats in the most cost-effective and sustainable manner.

7. The recommended plan was developed in coordination and consultation with various federal, state, and local agencies using our cost effectiveness and incremental cost analysis techniques to formulate ecosystem restoration solutions and evaluate the impacts and benefits of those solutions. Plan formulation evaluated a wide range of non-structural and structural alternatives under Corps policy and guidelines as well as consideration of a variety of economic, social, and environmental goals. The recommended plan delivers a sustainable approach to solve water resources and ecosystem challenges while contributing towards the goals of the EO 13508 strategy to restore tidal wetlands, enhance degraded wetlands, sustain fish and wildlife by restoring oyster habitat in a tributary of the Chesapeake Bay, and restore priority habitat such as submerged aquatic vegetation.

8. In accordance with the Corps Engineering Circular on sea level change (SLC), three sea level rise rates; a baseline estimate representing the minimum expected SLC, an intermediate estimate, and a high estimate representing the maximum expected SLC were analyzed during the study. Projecting the three rates over the 50-year period provides a predicted low level rise of 0.73 feet (ft), an intermediate level rise of 1.14ft, and a high level rise of 2.48ft. The project is designed based upon the historical, or minimum rate of SLC. The two elements of the project that would be most impacted by SLC are the SAV and wetland restoration, while SLC would have little or no effect on the reef habitat or scallop restoration. Marshes within the Lynnhaven basin have historically sustained themselves from the effect of SLC through vertical accretion, although migration landward is a possibility. Similarly, as the water column becomes deeper due to SLC, the SAV will migrate into shallow waters if allowed by the geography and development of the inundated shoreline. Because a large amount of the Lynnhaven shoreline is developed, the ability of the SAV and marshes to adjust to SLC may be limited.

9. In accordance with Corps Engineering Circular on review of decision documents, all technical, engineering, and scientific work underwent an open, dynamic, and vigorous review process to ensure technical quality. This included District Quality Control, Agency Technical Review (ATR) - coordinated by the Ecosystem Restoration Planning Center of Expertise (ECO-PCX), policy and Legal Compliance Review, Cost Engineering Directory of Expertise Review and Certification, and Model Review and Approval. All concerns of the ATR have been addressed and incorporated in the final report. Given the nature of the project, an exclusion from the requirement to conduct Type I Independent Peer Review was granted on 31 July 2013. Concerns expressed by the ECO-PCX team have been addressed and incorporated in the final report.

10. Washington level review indicates the plan recommended by the reporting officers is technically sound, environmentally and socially acceptable, and on the basis of Congressional directives, economically justified. The plan complies with all essential elements of the U.S. Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for

Water and Land Related Resources Implementation Studies. The recommended plan complies with other administration and legislative policies and guidelines. The views of interested parties, including federal, state, and local agencies, have been considered. State and agency comments received during review of the final report and environmental assessment were addressed. The EPA inquired whether information on sea level rise from another study in the area was considered. The Commonwealth of Virginia expressed concern regarding whether the required leases would be able to be obtained expeditiously; summarized prior coordination with and commitments to Virginia's regulatory and resource agencies; and made recommendations concerning project methods.

11. I concur with the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the plan for ecosystem restoration in the Lynnhaven River Basin, Virginia be authorized in accordance with the reporting officers' recommended plan at an estimated cost of $35,110,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 103 of WRDA 1986, as amended (33 U.S.C. 2213). Accordingly, the non-federal sponsor must agree with the following requirements prior to project implementation.

a. Provide 35 percent of total ecosystem restoration costs as further specified below:

(1) Provide 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;

(2) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements desired on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material as determined by the government to be required or to be necessary for the construction, operation, and maintenance of the project;

(3) Provide, during construction, any additional funds necessary to make its total contribution equal to 35 percent of total project costs.

b. Prior to initiation of construction, obtain approval from the Commonwealth of Virginia of an administrative designation in perpetuity for the river bottom areas required for the artificial reef and aquatic vegetation features of the project that provides sufficient protection to those areas from uses incompatible with the project;

c. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the outputs produced by the project, hinder operation and maintenance of the project, or interfere with the project's proper function;

d. Shall not use project or lands, easements, and rights-of-way required for the project as a wetlands bank or mitigation credit for any other project;

e. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 Code of Federal Regulations Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

f. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the federal government;

g. Hold and save the United States free from all damages arising from the design, construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors.

h. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under the lands, easements, or rights-of-way that the federal government determines to be required for construction, operation, and maintenance of the project. However, for lands that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigation unless the federal government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;

i. Assume, as between the federal government and the non-federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the federal government determines to be required for construction or operation and maintenance of the project;

j. Agree, as between the federal government and the non-federal sponsor, that the non-federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA.

12. The recommendation contained herein reflects the information available at this time and current departmental policies governing the formulation of individual projects. It does not reflect

program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the City of Virginia Beach, Virginia (the non-federal sponsor), the state, interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

THOMAS P. BOSTICK
Lieutenant General, USA
Chief of Engineers