1. INTRODUCTION

Poplar Island is an environmental restoration project located in the Chesapeake Bay, Talbot County, Maryland; 39 miles (34 nautical miles) south-southeast of the Port of Baltimore, and two miles northwest of Tilghman Island (Figure 1-1). Dredged material from the Upper Chesapeake Bay Approach Channels to the Port of Baltimore is being beneficially used to restore 1,140 acres of wetland and upland habitat (Figure 1-2). The Poplar Island Environmental Restoration Project (PIERP) is planned to create approximately 570 acres of wetland and 570 acres of upland habitat, and it is estimated that by 2014 PIERP will provide up to 40 million cubic yards (mcy) of dredged material placement capacity. The island restoration will resemble the approximate 1847 footprint, which, as of 1996, had eroded to three separate islands with an area of less than three acres. To date, approximately 12 mcy of dredged material has been placed at the site.

The goals of the PIERP are to:

- Restore remote island habitat in the mid-Chesapeake Bay using clean dredged material from the Chesapeake Bay Approach Channels to the Port of Baltimore,
- Optimize site capacity for clean dredged material while meeting the environmental restoration purpose of the project, and
- Protect the environment around the restoration site.

The PIERP was developed through the cooperative efforts of Federal and State agencies, along with private, commercial, and environmental organizations. Prior to the start of construction, an *Integrated Feasibility Report and Environmental Impact Statement (EIS) for the PIERP* was completed in 1996 (USACE/MPA, 1996). Phase I (the northern 640 acres) of the exterior dike construction at PIERP started in 1998 and was completed in 2000, and dredged material inflow at PIERP commenced in April 2001. Phase II (the southern 500 acres) construction of the PIERP was completed in 2002.

1.1 STUDY PURPOSE AND NEED

Engineering Regulation (ER) 1105-2-100 requires dredged material management planning for Federal harbor projects to ensure that sufficient dredged material placement capacity is available during the life of a navigation project. This protects the Federal investment and ensures that dredging and placement activities are performed in an environmentally acceptable manner, are conducted using sound engineering techniques, and are economically warranted. The United States Army Corps of Engineers, Baltimore District (USACE-Baltimore) and Philadelphia District (USACE-Philadelphia) are responsible for operating and maintaining approximately 130 miles of dredged Federal navigation channels that serve the Port of Baltimore.

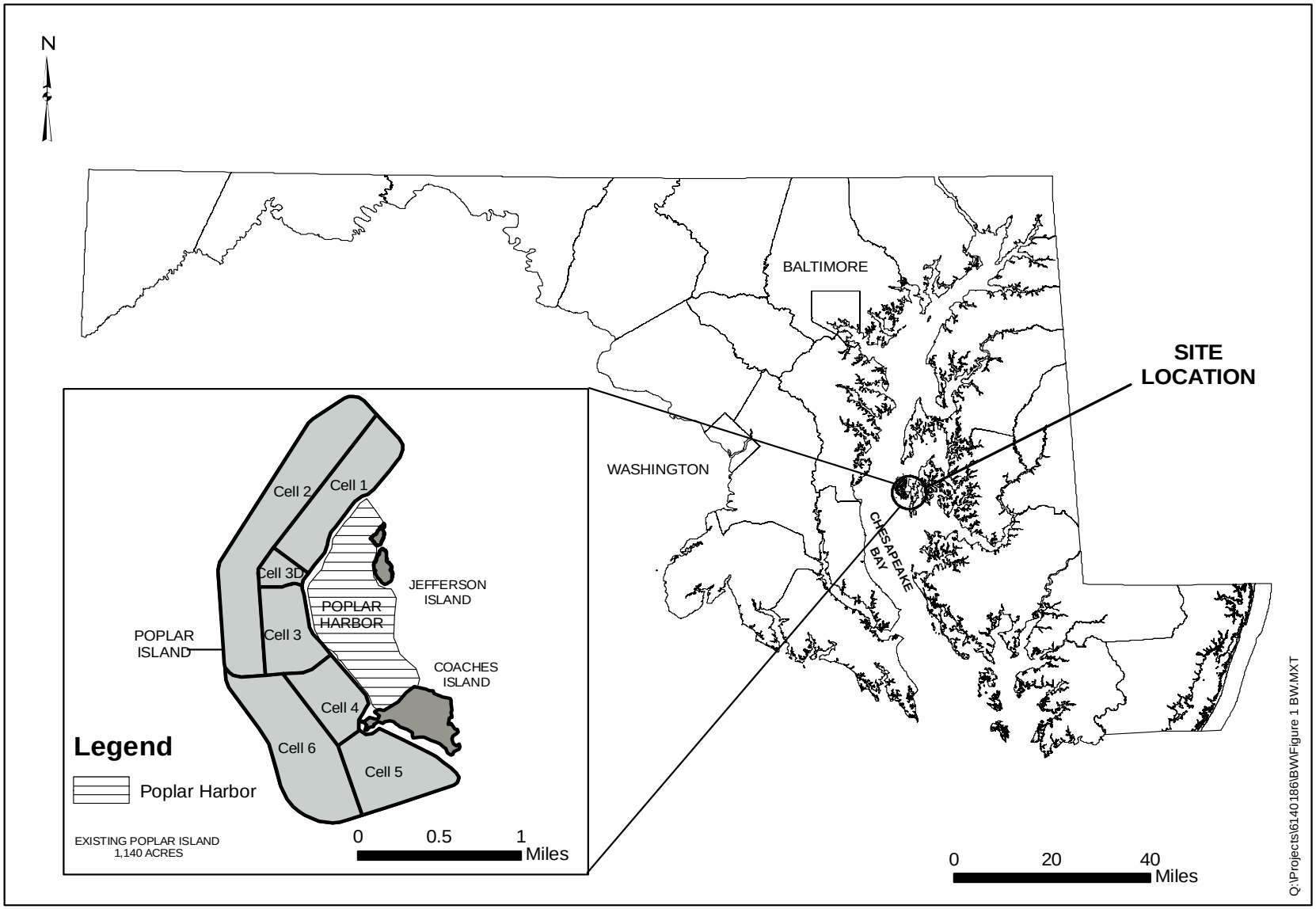

Figure 1-1. Poplar Island Site Location Map

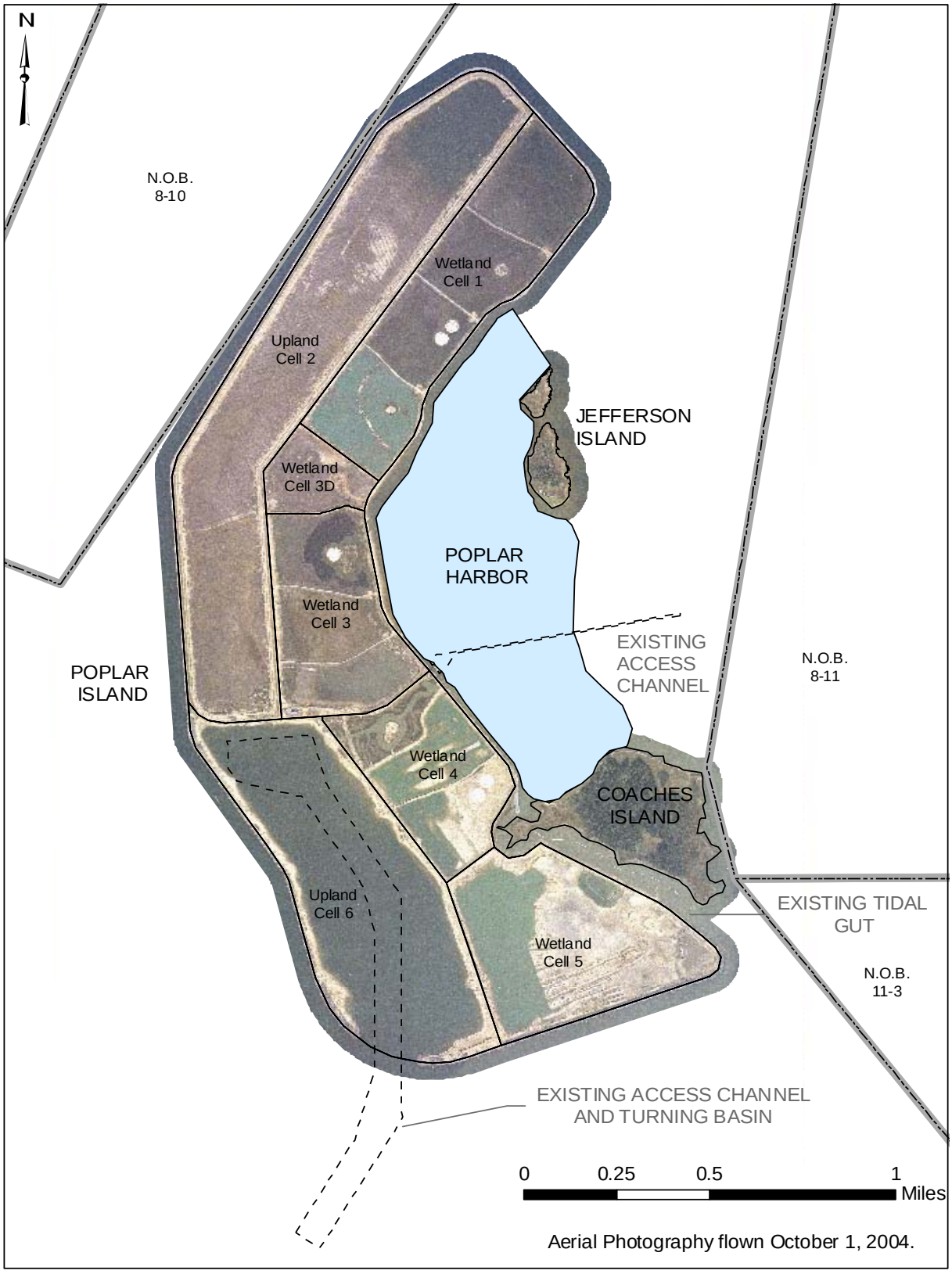

Figure 1-2. Existing Poplar Island Configuration

The *Baltimore Harbor and Channels Dredged Material Management Plan, Preliminary Assessment Draft* (USACE, 2001a) identified insufficient dredged material capacity to meet Federal and State of Maryland needs in the next twenty years, insufficient time to create new placement sites, and the potential for inefficiencies at existing placement sites, if new sites are not constructed. USACE guidance (Policy Guidance Letter No. 40) specifies that the expansion of existing sites should be considered for placement capacity before new placement sites are proposed.

To address the predicted dredged material placement capacity shortfall, USACE-Baltimore and Maryland Port Administration (MPA) initiated the Poplar Island Expansion Study, in order to prepare an Integrated General Reevaluation Report (GRR)/Supplemental Environmental Impact Statement (SEIS). The purpose of the GRR/SEIS was: (1) to investigate the environmental effects of a lateral and/or vertical expansion to the existing PIERP to increase habitat restoration and additional dredged material capacity; (2) to evaluate other project enhancements at both the PIERP and within Poplar Harbor; (3) to evaluate placement of dredged material from other channels; and (4) to assess additional actions for the completion of the existing project.

The expansion of the PIERP was one of five alternatives recommended in the *Baltimore Harbor and Channels Dredged Material Management Plan and Tiered Environmental Impact Statement* (USACE, 2005) that were applicable to the Upper Chesapeake Bay Approach Channels to the Port of Baltimore. The expansion of PIERP was also identified as a high priority based on preliminary dredging needs studies for the Upper Chesapeake Bay Channels that were conducted as part of the State of Maryland's DMMP [*Interim Report to the Maryland General Assembly Concerning Implementation of the Dredged Material Management Act of 2001*, (DMMP, 2001)]. Both the Federal and State DMMP processes are described in detail in Chapter 2.

A General Reevaluation Report (GRR) documents the reassessment of a previously authorized project using current planning criteria and policies when a significant period of time has elapsed or if conditions have changed since the initial feasibility study was completed (ER 1105-2-100). The results of the GRR may affirm the previous plan; reformulate it, as appropriate; or find that no plan is currently justified. Actions associated with a GRR are subject to compliance with the National Environmental Policy Act (NEPA) of 1969 [40 Code of Federal Regulation (CFR) Parts 1500-1508], as amended, and the regulations of the President's Council on Environmental Quality (CEQ). The nature and scope of the changes to the environmental effects of the project identified as a result of new information, of changed conditions, or changes to the project determine the appropriate type of NEPA documentation.

This Integrated GRR/SEIS documents the NEPA compliance for the expansion of the PIERP, provides information specific to the actions of the GRR and supplements the *Poplar Island Restoration Study, Maryland: Integrated Feasibility Report and Environmental Impact Statement* (ERP No. D-COE-D350557-MD) (USACE/MPA, 1996). The objectives of the PIERP GRR/SEIS include increasing habitat restoration, providing additional dredged material capacity, and evaluating other project design modifications. The overall habitat and operational objectives of the expansion (discussed in more detail in Chapter 3) are meant to be

flexible, measurable, attainable, and congruent. The objectives are intended to be consistent with both the existing PIERP and the concurrent Mid-Chesapeake Bay Island Restoration Study. Ultimately, the recommended plan from the Integrated GRR/SEIS is intended to be complementary to, and consistent with, the success of the existing PIERP, and will be based on lessons learned to improve site efficiency and habitat quality.

1.2 STUDY AUTHORITY

In 2003, USACE-Baltimore and Maryland Port Administration (MPA) initiated the Poplar Island Expansion Study under the existing PIERP Congressional Authorization, Section 537 of the Water Resources Development Act (WRDA) of 1996. Authorization for projects identified '*for the protection, restoration, and creation of aquatic and ecologically related habitats, including wetlands, in connection with dredging for construction, operation, or maintenance by the Government of an authorized navigation project*' is included in Section 204 of the WRDA of 1992, as amended by Section 207 of the WRDA of 1996. The Integrated Feasibility Report and EIS for the PIERP was completed in 1996 (USACE/MPA, 1996), and construction began in 1998.

This GRR study is being conducted under the existing Poplar Island project authorization, Section 537 of the WRDA 1996, which reads:

> *"The Secretary shall carry out a project for the beneficial use of dredged material at Poplar Island, Maryland, substantially in accordance with, and subject to the conditions described in, the report of the Secretary dated September 3, 1996, at a total cost of $307,000,000, with an estimated Federal cost of $230,000,000 and an estimated non-Federal cost of $77,000,000. The project shall be carried out under the policies and cooperative agreement requirements of section 204 of the Water Resources Development Act of 1992 (33 U.S.C. 2326), except that subsection (e) of such section shall not apply to the project authorized by this section.*

Section 318 of WRDA 2000, Public Law (PL) 106-541, modifies the authorizing language of Poplar Island to provide that the Non-Federal sponsor's share of the cost of the project may be provided in cash or in the form of in-kind services or materials. It also directs the Government to credit the Non-Federal sponsor share of the cost of the Project prior to the date of execution of the Project Cooperation Agreement (PCA) if the Government determines that the work is integral to the Project.

The PCA for the construction of Poplar Island (USACE/MPA, 1997) between the Department of the Army, represented by the Assistant Secretary of the Army (Civil Works), and the State of Maryland ('the Non-Federal sponsor'), represented by the Secretary of the Maryland Department of Transportation (MDOT) was signed on 4 April 1997 and has been amended twice - on 11 July 1997 and 9 April 2002.

The existing PIERP is also subject to Section 902 of WRDA 1986, which limits cost increases in the authorized project to 20 percent. Section 902 reads, in part:

> *"In order to insure against cost overruns, each total cost set forth in this Act, or an amendment made by this Act, for a project shall be the maximum cost of that project, except that such maximum amount - (1) may be increased by the Secretary for modifications which do not materially alter the scope or functions of the project as authorized, but not by more than 20 percent of the total cost stated for the project in this Act or in an amendment made by this Act…."*

A Notice of Intent (NOI) to initiate the Integrated GRR/SEIS was published in the Federal Register: June 5, 2003 (Volume 68, Number 108) Page 33685-33687. The PIERP Integrated GRR/SEIS is sponsored by a Federal agency, the USACE–Baltimore District, and a non-Federal sponsor, MPA, under the auspices of the Maryland Department of Transportation (MDOT). Throughout the GRR/SEIS, the non-Federal sponsor is referred to as either the "MPA" or the "State of Maryland".

Authority to include recreational components as part of the project purpose is found in the Flood Control Act of 1944, as amended, the Federal Water Project Recreation Act of 1965 (PL 89-72) and the WRDA 1986. These acts each grant broad authority to include recreation as a project purpose, however USACE policy (ER1105-2-100) limits the exercise of these authorities.

1.3 PROJECT LOCATION

Poplar Island is located in Talbot County, Maryland, in the upper-middle portion of the Chesapeake Bay (Figure 1-1). The PIERP is located between the mouth of Eastern Bay to the north, and the Choptank River to the south. The existing PIERP and Study Area evaluated in this Final Integrated GRR/SEIS are located within the mid-Chesapeake Bay mainstem, close to the Eastern Shore of Maryland, in the South Central Bay segment [Maryland Department of Natural Resources (MDNR) waterbody code 027].

Two privately-owned islands, Coaches Island and Jefferson Island are located adjacent to Poplar Island and Poplar Harbor (Figure 1-2). Poplar Island is separated from Coaches Island by a narrow tidal gut, and Jefferson Island is located within Poplar Harbor. Natural oyster bars (NOBs) are located to the northwest, north, and east of Poplar Island. Poplar Harbor is defined as the quiescent area located from the eastern shoreline of central Poplar Island to the extent of Jefferson Island to the east, and from the northern tip of Jefferson Island to the northern tip of Coaches Island (Figure 1-2). Poplar Harbor encompasses a total of 282 acres [as defined by the United States Fish and Wildlife Service (USFWS), 2003].

1.4 STUDY TEAM

To optimize the environmental restoration alternatives developed through this study and to ensure the final recommended plan would be supported by the other resource agencies, a multi-agency approach was developed to complete the formation of the study team. Multi--

agency interaction during the design phase and GRR/SEIS preparation was essential to facilitate the flow of necessary information among agencies and to achieve project support by the key public agencies. Agency representatives for the study team were drawn from the Poplar Island Working Group, a multi-agency group that provides recommendations to the PIERP Ecosystem Restoration Project Coordination Team (ERPCT) on regulatory compliance, habitat development and management, and resource monitoring.

The study team for the PIERP Final Integrated GRR/SEIS, the Project Delivery Team (PDT), was comprised of Federal, State, and local organizations and stakeholders. These agencies and groups have shown a special interest in the study, have a certain area of expertise required for the study, or have planning or regulatory responsibilities. Since the PIERP is an on-going project with operations, maintenance, and monitoring constantly in progress, the study team assembled to complete the GRR/SEIS for PIERP included staff from Federal and State agencies, universities, and other interested groups and individuals that have participated in other phases of the PIERP. A more detailed description of the PDT is included in Section 9.1.2 and Figure 9-1. The purpose of the PDT was to provide input and technical expertise and to guide the preparation and information required for the PIERP GRR/SEIS. This group, which was directed by the USACE-Baltimore District (lead agency), included personnel from agencies including MPA (local sponsor), Maryland Department of the Environment (MDE), MDNR, Maryland Environmental Services (MES), Maryland Geological Survey (MGS), National Oceanic and Atmospheric Administration (NOAA), NOAA Fisheries [National Marine Fisheries Service (NMFS)], U.S. Environmental Protection Agency - Region III (USEPA), USFWS, U.S. Geological Survey (USGS), U.S. Environmental Protection Agency - Chesapeake Bay Program (CBP), Citizen's Advisory Committee (CAC), University of Maryland Center for Environmental Science – Horn Point Environmental Laboratory (UMCES/HPEL), University of Maryland Center for Environmental Science – Chesapeake Biological Laboratory (UMCES/CBL), Ohio University, Anne Arundel Community College (AACC), USACE- Philadelphia District, and various other private-interest groups and organizations that are stakeholders in the Bay, such as conservation groups, sportsmen, boaters, and watermen.

USACE team members were drawn from the staff of the Baltimore District and included representatives from the Programs and Project Management Division (PPMD), the Planning Division, the Operations Division, the Engineering Division, the Real Estate Division, and the Office of Counsel. Representatives from USACE Headquarters (HQ) were involved in the alternative formulation briefing (AFB), project planning discussions, and the final review and approval of the document. MPA team members were drawn from the staff of the Harbor Development Branch of the MPA. Maryland Environmental Service (MES) provided environmental, dredged material management, and project management expertise. In addition, representatives from USACE-Philadelphia District were involved in the AFB and project planning discussions, conducted the independent technical review (ITR) and were included in discussions to evaluate accepting dredged material from additional channels, specifically with respect to the southern approach channels to the Chesapeake and Delaware (C&D) Canal.

1.5 STUDY COMPONENTS

This Integrated GRR/SEIS addresses the environmental effects of proposed expansion activities at the PIERP. Alternatives evaluated in the Final Integrated GRR/SEIS include constructing a lateral expansion of the existing PIERP and/or raising the final design height of the existing upland cells. Also to be considered along with the expansion are environmental enhancements at PIERP and within Poplar Harbor, increased recreational and educational opportunities, and the potential for accepting dredged material from additional Federal, State, and local channels. Accepting dredged material from the southern approach channels to the C&D Canal is specifically considered for inclusion in the re-authorization of PIERP. Dredged material from Federal navigation channels within Baltimore Harbor/Patapsco River (west of the North Point-Rock Point line) are **not** being considered for placement at PIERP.

1.5.1 Expansion of Existing PIERP

To investigate increasing the dredged material placement capacity at PIERP, three initial options for expansion were considered: 1) vertical expansion only, 2) lateral expansion only, and 3) lateral expansion plus vertical expansion. The vertical expansion was only considered for the existing upland cells (Cells 2 and 6) at the PIERP. A vertical expansion of the existing wetland cells at PIERP was not considered; the existing upland Cells 2 and 6 at PIERP can be raised without additional impacts to the existing wetland cells.

1.5.2 Environmental Enhancements

1.5.2.a Poplar Harbor Poplar Harbor is located east of PIERP and is protected from the wave energy of the open Chesapeake Bay by the PIERP to the west, Coaches Island to the south, and Jefferson Island to the north (Figure 1-2). Submerged aquatic vegetation (SAV) was documented within Poplar Harbor in 2004. It is likely that SAV growth will continue because of the quiescent nature of the shallow water habitat, although the sustained recovery and colonization of SAV in Poplar Harbor cannot yet be declared. It is anticipated that additional protection to Poplar Harbor SAV habitat could be afforded by a lateral expansion.

1.5.2.b Jefferson Island Jefferson Island is a privately-owned island that was most likely once part of the original Poplar Island archipelago that existed prior to the construction of PIERP. Although erosion to Jefferson Island has probably been reduced since the construction of PIERP, the island is subject to continued erosion from wind generated waves from the north-northeast and south-southeast that has reduced its landmass and increased the both the water column turbidity and sedimentation in Poplar Harbor. Adverse water clarity could hinder the on-going SAV restoration efforts in Poplar Harbor. For these reasons, protection of Jefferson Island to reduce shoreline erosion was evaluated as an environmental enhancement in the SEIS.

1.5.2.c Diamondback Terrapin Habitat The diamondback terrapin (*Malaclemys terrapin*) is an important species in the Chesapeake Bay that prefers remote, sandy beaches for nesting. Ideal habitat for the diamondback terrapin is becoming scarce throughout the Chesapeake Bay region because of the cumulative impacts of shoreline hardening. The construction of

shoreline structures has decreased the amount of terrapin nesting habitat by converting natural shoreline habitat to structures. Indirect losses of natural terrapin nesting habitat has occurred from a combination of impacts related to sea-level rise and erosion. However, diamondback terrapins have had success nesting along the sandy beaches that resulted from the construction of the PIERP. Therefore, the GRR/SEIS considered the incorporation of features to enhance terrapin habitat.

1.5.3 Recreational/Educational Opportunities

The Talbot County government requested that the PIERP GRR/SEIS include an evaluation of recreational and educational opportunities, such as interpretive nature trails and other passive recreation. Such features could be incorporated into the design of the island without compromising the intent and restoration goals of the project, specifically to create remote island habitat. According to USACE guidance (ER 1105-2-100 and Policy Guidance Letter No. 59), the Federal cost for recreational and educational features must be less than 10 percent of the project total cost. Any recreational and educational features implemented at PIERP would be coordinated extensively with interested agencies and local jurisdictions.

1.5.4 Acceptance of Dredged Material from Other Channels

Currently, only dredged material from Federally authorized approach channels to the Port of Baltimore specifically authorized in the Poplar Island EIS (USACE/MPA, 1996) and the PCA for PIERP (April 1997) is accepted for placement at PIERP. Dredged material approved for placement at PIERP is limited to the following Upper Chesapeake Bay Federal navigation channels: the Craighill Entrance Channel, the Craighill Channel, the Craighill Angle, the Craighill Upper Range, the Cutoff Angle, the Brewerton Channel Eastern Extension, the Tolchester Channel, and the Swan Point Channel (Figure 1-3). Dredged material from Federal navigation channels north of Tolchester Channel, specifically the southern approach channels to the Chesapeake and Delaware (C&D), is currently placed at the Pooles Island open-water site (Figure 1-4). The Pooles Island open-water placement site is set to close by 2010 (by State of Maryland law), necessitating another option for dredged material placement for these channels beginning in 2010. However, Pooles Island will close sooner than 2010 if the remaining capacity of 7.5 mcy is achieved before the site is mandated to close by State law.

The PIERP Final Integrated GRR/SEIS investigated both the sediment quality and environmental considerations to provide a recommendation to accept dredged material from the southern approach channels to the C&D Canal and to develop sediment quality guidelines/protocols for accepting dredged material from other projects (including Federal, State, and local channels) for placement at PIERP. The project authorization and PCA will require modification to accept dredged material from additional channels for placement at PIERP.

1.5.5 Additional Actions for Completion of Existing Project

Under the auspices of the GRR, USACE-Baltimore District assessed the current project and identified several additional actions required to complete the existing project. These actions were not specifically evaluated in the initial EIS for the existing project (USACE/MPA, 1996), and are, therefore, included in the GRR/SEIS (NEPA evaluation). These actions include raising the existing upland temporary dikes from +23 ft MLLW to +25 ft MLLW and Cell 6 closure and additional cell activities.

1.5.5.a Raising the Existing Upland Cells from +23 ft MLLW to +25 ft MLLW In the EIS for the existing project (USACE/MPA, 1996), the upland dikes were limited to a temporary height 3 feet above the final design height of +20 ft MLLW (+23 ft MLLW). However, based on both the on-going site operations and studies conducted subsequent to the 1996 EIS, a temporary dike height of +25 ft MLLW is needed to achieve proper consolidation of the dredged material. Therefore, a design modification to raise existing upland cells temporarily from +23 ft MLLW to +25 ft MLLW was evaluated. The final design height of the existing cells at the PIERP would remain at +20 ft MLLW.

1.5.5.b Cell 6 Closure and Additional Cell Activities Cell 6 is currently an open-water basin with free, unrestricted tidal exchange with the Chesapeake Bay (Figure 1-2). The access channel in Cell 6 is used to bring equipment and dredged material into the project. To close Cell 6 off from the Bay and allow dredged material placement within the cell, additional construction is necessary. Actions required for Cell 6 closure include: relocation of the existing access channel opening at the southern end of Cell 6, dredging of a turning basin, sand borrow excavation south of the existing project, raising the Cell 6 perimeter dike to elevation +25 ft MLLW, relocating the existing offloading facilities and fuel farm, and constructing a new pier. Additional cell activities required to complete the project include the restoration of internal borrow sites within wetland Cell 4 and construction of temporary cross dikes within wetland Cell 5.

1.6 STUDY PROCESS

The Poplar Island Final Integrated GRR/SEIS followed a process that integrated the NEPA process into the USACE's six-step planning process (ER 1105-2-100), as described below. It is important to note that the steps in the planning process usually occur iteratively, and sometimes concurrently, in order to formulate efficient, effective, complete, and acceptable alternative plans.

NEPA requires Federal agencies to analyze and consider the direct and indirect environmental and socioeconomic impacts associated with proposed Federal projects, including when a Federal agency takes an action, when a Federal permit or authorization is needed, and/or when Federal funding is used. Compliance with NEPA requires that projects undergo a rigorous process of stakeholder input, alternatives and impact analysis, and review by Federal and State agencies– this process is generally termed the "NEPA Process." For larger projects with anticipated significant impacts, the NEPA process is documented in the form of an EIS or SEIS.

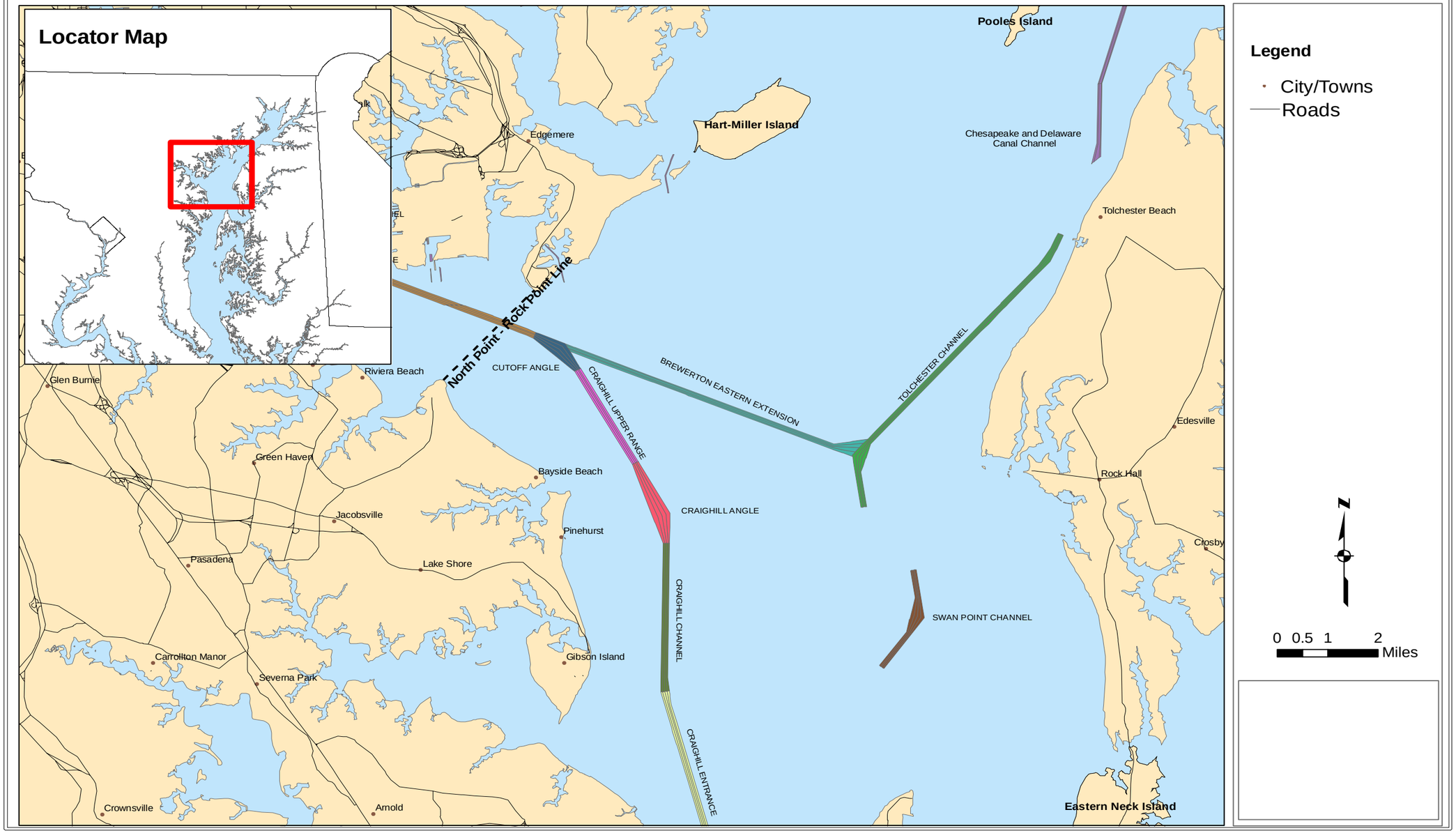

Figure 1-3. Upper Chesapeake Bay Approach Channels to the Port of Baltimore Authorized for Placement at Poplar Island

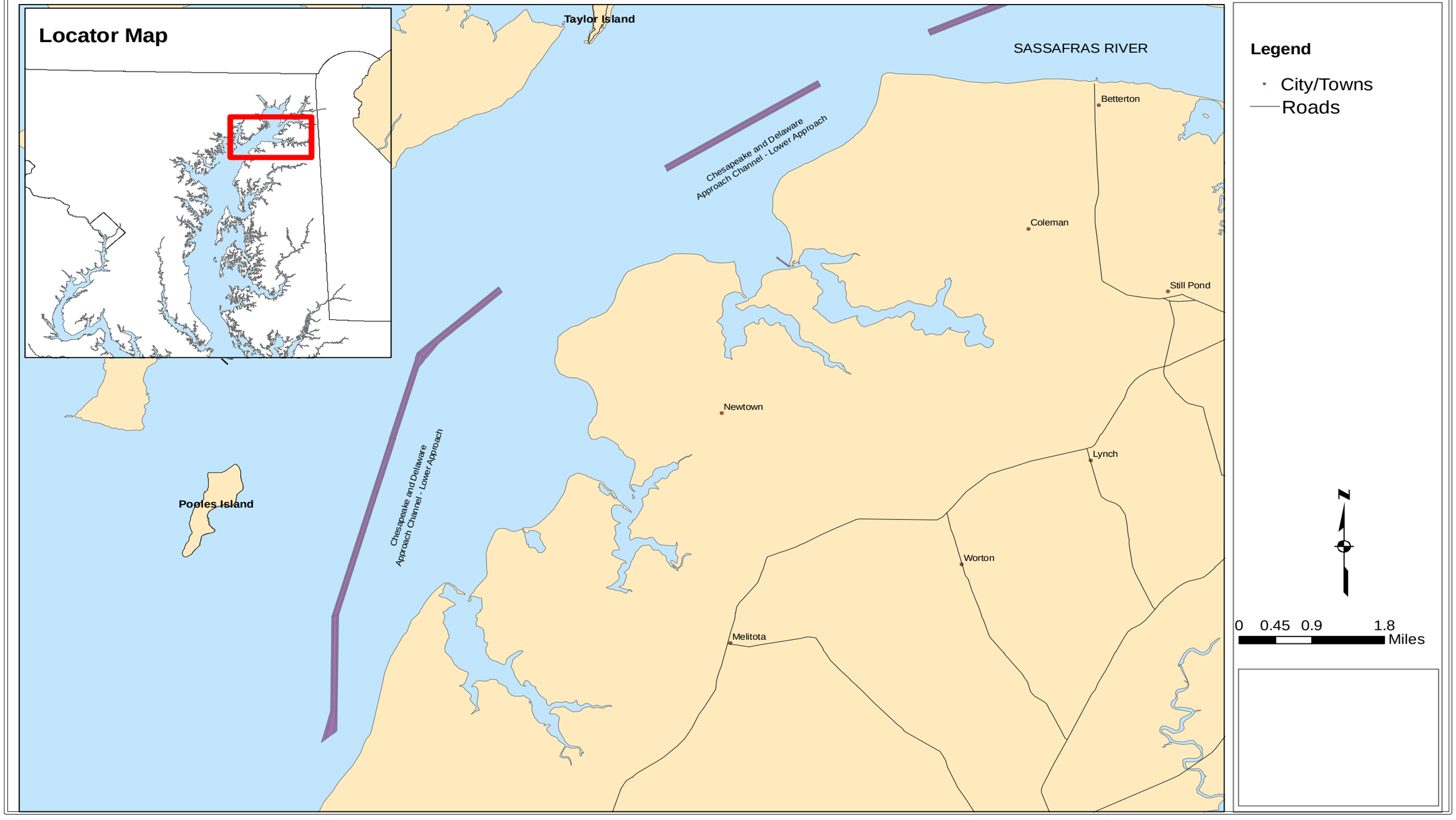

Figure 1-4. Approach Channels to the Chesapeake and Delaware (C&D) Canal

The NEPA process incorporates input from the public during the various stages of development by providing stakeholders (Federal, State, and local agencies as well as private interest groups and the general public) with an opportunity to participate and comment. The NEPA process requires the evaluation of a "no-action (without proposed project) alternative" in addition to considering alternatives to the proposed action. When selecting a preferred alternative, the Federal agency is required to consider not only the environmental impacts associated with the proposed action and action alternatives, but also the cumulative impacts of the project in the reasonably foreseeable future and to balance them with the agency's statutory mission, needs, responsibilities, and relevant technical and economic factors. Therefore, this document analyzes the direct effects (those caused by the proposed action and occurring at the same time and place), the indirect effects (those caused by the proposed action and occurring later in time or farther removed in distance but still reasonably foreseeable), and the cumulative effects (the combined effects on quality of the human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions) of the proposed action and the no-action alternative.

The NEPA process is initiated through scoping, and followed by a development of alternatives, an alternatives impact analysis, a draft EIS/SEIS and public review period, and ultimately a final EIS/SEIS. This process is detailed below and included in Figure 1-5. At the conclusion of the NEPA process, appropriate Federal findings will be documented in a Record of Decision (ROD).

1.6.1 USACE Six-Step Planning Process

Step 1: Identify problems and opportunities (project scoping)

Problems and opportunities are defined in order to consider all potential alternatives to solve the problems and achieve the opportunities. Once the problems and opportunities are properly defined, the study planning objectives and constraints can be clearly defined. Project constraints are known limitations in the planning process, and can be associated with resources (limitations on knowledge, expertise, experience, ability, data, information, money, and time) or with legal and policy limits (as defined by law, USACE policy and guidance). The information on problems and opportunities will help to identify primary issues that need to be addressed in subsequent stages of the planning process. Step 1 of the planning process can be combined with the NEPA scoping process, which determines the scope of issues to be addressed and identifies the significant issues related to a proposed action.

Public participation is an integral part of the scoping process. The proposed project is announced to the public by issuing a Notice of Intent in the Federal Register and press releases. Public comments are solicited about details that should be included in the study. One or more public meetings in the local communities that might be affected by the proposed action are normally scheduled (but not required) to solicit additional comments about the project. The purpose of soliciting public input is to properly identify relevant issues, alternatives, and mitigation measures, such that these issues, concerns, or needs can be incorporated and addressed in the EIS/SEIS.

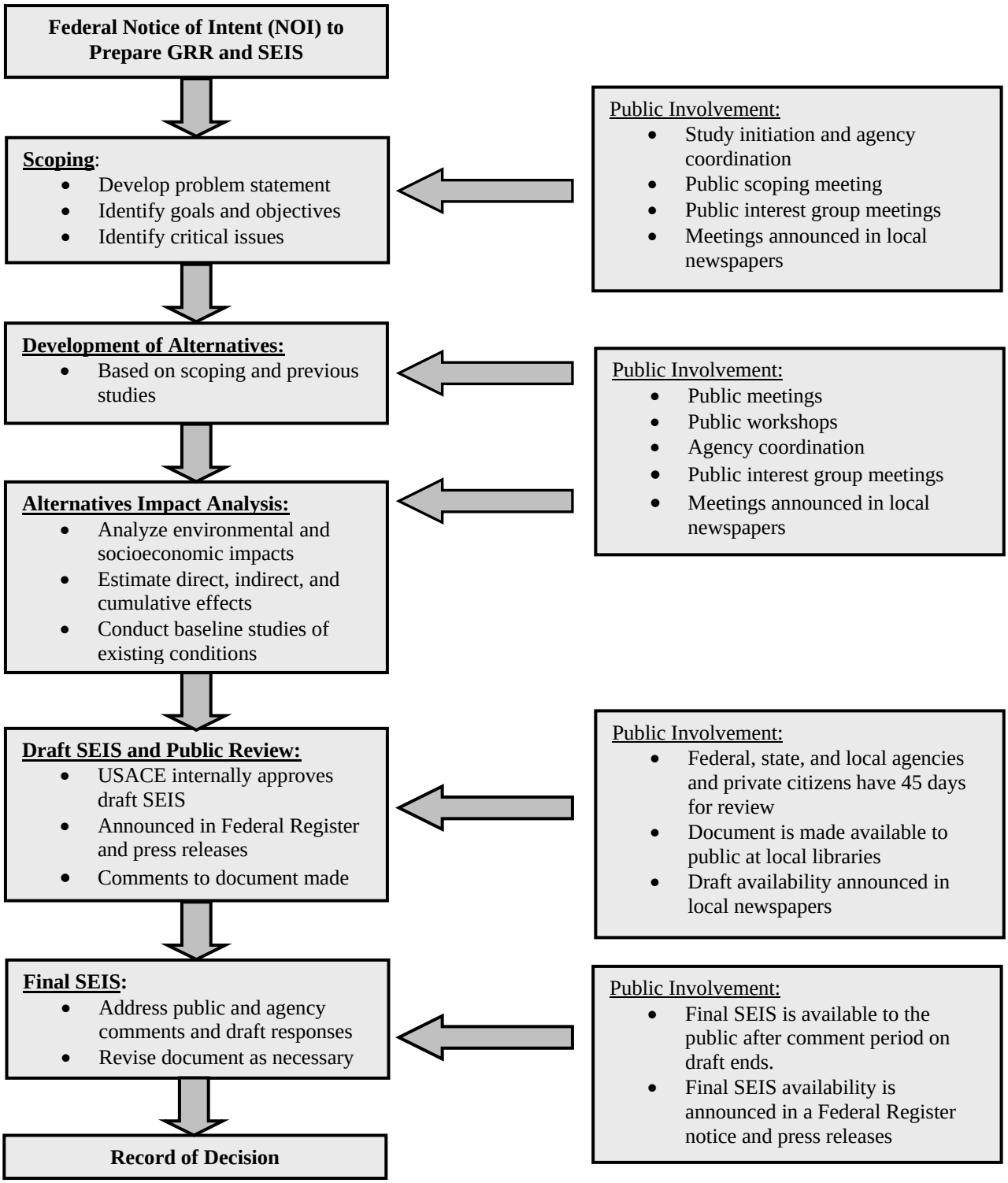

Figure 1-5. National Environmental Policy Act (NEPA) Study Process Flowchart

Interested parties solicited for input include:

- Citizens who live or work in the area of the proposed project;
- Public interest groups and communities that have concerns about possible impacts to environmental or socioeconomic resources;
- Federal, State, and local government agencies that have responsibilities for managing public resources or services; and
- Scientists and other technical experts with knowledge of the area's natural resources and the possible impacts of the proposed project

An important objective of the scoping process is to identify specific elements of the environment that might be affected if the proposed project is carried out. If impacts are associated with a concern that is raised during scoping, these concerns are analyzed in detail in the EIS/SEIS.

Step 2: Inventory and forecast conditions

A quantitative and qualitative inventory and forecast of critical resources (i.e., physical, demographic, economic, and social) relevant to the problems and opportunities under consideration is used to define existing and future without-project conditions. Existing conditions are those at the time the study is conducted. The future without-project condition reflects the conditions expected during the period of analysis, and provides the basis from which alternative plans are formulated and impacts are assessed.

Step 3: Formulate alternative plans

Alternative plans, including a no-action (no build) alternative, are formulated to identify specific ways to achieve planning objectives within the constraints. In addition to the alternatives that can be directly implemented by the USACE under current authorities, alternatives that could be implemented under the authorities of other Federal agencies, State and local entities, and non-government interests should also be considered. The public is invited to participate in the development of alternatives in the form of public meetings and/or public workshops. Agency coordination meetings may also occur when developing alternatives for the project.

Step 4: Evaluate alternative plans

The evaluation of effects is a comparison of the with-project and without-project conditions, and includes identifying the most likely with-project condition for each alternative, comparing each alternative to the no-action alternative, and characterizing the beneficial and adverse effects of each alternative.

Step 5: Compare alternatives (impacts analysis)

The EIS/SEIS analyzes and compares the potential environmental and socioeconomic adverse and beneficial impacts of all alternatives, including the no-action alternative, developed in the previous steps. The objective of the analysis is to estimate the direct, indirect, and cumulative impacts that might occur, and to compare the impacts of the proposed action with

each of the alternatives. The alternatives impact analysis may require collection of scientific or economic data from the region of influence, or the area potentially impacted by the proposed project.

Step 6: Select and describe the recommended plan

A single alternative plan is selected as the recommended plan from the alternatives that were considered. The recommended plan is the alternative that is preferable to taking no action or implementing any of the other alternatives considered during the planning process.

1.6.2 Documentation of the NEPA Process

Draft EIS and Public Review

The impacts analysis is first documented in a draft EIS/SEIS. After the USACE internally approves the draft EIS/SEIS, the document is made available to the public and the applicable Federal, State, and local agencies for a minimum of 45 days for review and comment. The availability of the draft EIS/SEIS is announced in a Federal Register notice and in press releases. Copies of the document are made available to the public through individual mailings and public libraries. The public may either comment in writing to the USACE or by making oral comments at one of the public hearings that are held in areas most likely to be affected by the proposed project.

Final EIS

The main component in developing the final EIS/SEIS is to address the public and Federal, State and local agency comments on the draft EIS in a responsive and meaningful manner. The final EIS/SEIS includes a summary of all comments and the responses of the Federal agency. The USACE is tasked with preparing the EIS/SEIS and is responsible for drafting responses. After the comments on the draft EIS/SEIS are reviewed, the document is revised to address the comments and to add any relevant new information that became available since the draft EIS/SEIS was published. New information may include new modeling results, updated design plans of the proposed project, or new mitigative measures. A summary of the comments received on the draft EIS/SEIS and the USACE responses to the comments are incorporated into the final document. Normally, a final EIS/SEIS is made available to the public within six months after the comment period on the draft EIS/SEIS ends. Again, the availability of the final EIS/SEIS is announced in a Federal Register notice and press releases.

Record of Decision

At the conclusion of the NEPA process, appropriate Federal findings are documented in a ROD. The USACE will prepare documentation to support and explain the decision on the proposed project, or consideration of funding for the proposed project. The ROD will contain findings, explanations of findings, and a decision on whether the USACE may or may not provide the approvals and Federal Actions necessary to facilitate the proposed project based on projected environmental and socioeconomic impacts.

1.7 APPLICABLE STATUTES AND REGULATIONS

The National Environmental Policy Act of 1969

Public Law 91-190 establishes a broad national policy to improve the relationship between humans and their environment, and sets out policies and goals to ensure that environmental considerations are given careful attention and appropriate weight in all decisions of the Federal Government.

Federal Statutes

- The American Indian Religious Freedom Act
- Antiquities Act of 1906, as amended
- Archaeological and Historic Preservation Act of 1974, as amended
- Archaeological Resource Protection Act of 1979, as amended
- Bald Eagle Act of 1972
- Barrier Resources Act of 1982
- Clean Air Act of 1972, as amended
- Clean Water Act of 1972, as amended
- Coastal Zone Management Act of 1972, as amended
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Endangered Species Act of 1973
- Estuary Protection Act of 1968
- Farmland Protection Policy Act
- Federal Environmental Pesticide Act of 1972
- Federal Water Project Recreation Act of 1965, as amended
- Fish and Wildlife Coordination Act of 1958, as amended
- Fishery Conservation and Management Act
- Historic Sites Act of 1935
- Land and Water Conservation Fund Act of 1965
- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Mammal Protection Act of 1972, as amended
- Marine Protection, Research, and Sanctuaries Act of 1972
- Migratory Bird Conservation Act of 1928, as amended
- Migratory Bird Treaty Act of 1918, as amended
- National Historic Preservation Act of 1966, as amended
- National Historic Preservation Act Amendments of 1980
- Native American Graves Protection and Repatriation Act
- Noise Control Act of 1972, as amended
- North American Wetlands Conservation Act
- Occupational Health and Safety Act
- Resource Conservation and Recovery Act of 1976
- River and Harbor Act of 1899
- River and Harbor and Flood Control Act of 1962, Section 207
- Safe Drinking Water Act of 1974, as amended
- Solid Waste Disposal
- Superfund Amendments and Reauthorization Act of 1986

- Toxic Substances Control Act of 1976
- Water Resources Development Acts of 1986, 1988, 1990, 1992, and 1996
- Water Resources Planning Act
- Watershed Protection and Flood Prevention Act of 1954, as amended
- Wild and Scenic Rivers Act of 1968, as amended
- Wilderness Act

Executive Orders (EO)

- Protection and Enhancement of Environmental Quality (EO 11514)
- Protection and Enhancement of Cultural Environment (EO 11593)
- Floodplain Management (EO 11988)
- Protection of Wetlands (EO 11990)
- Compliance with Pollution Control Standards (EO 12088)
- Prime and Unique Farmlands (Memorandum, Council on Environmental Quality, 11 August 1980)
- Environmental Justice (EO 12898)
- Protection of Children from Health and Safety Risks (EO 13045)
- Recreational Fisheries (EO 12962)
- Environmental Effects of Major Federal Actions (EO 12114)
- Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186)
- Facilitation of Cooperative Conservation (EO 13352)

Other Federal Policies

- Council on Environmental Quality Memorandum of August 11, 1980: Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing the National Environmental Policy Act

- Council on Environmental Quality Memorandum of August 10, 1980: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory

- Migratory Bird Act Treaties and other international agreements listed in the Endangered Species Act of 1973, as amended, Section 2 (a)(4)

United States Army Corps of Engineers Regulations and Guidance

- Engineering Regulation 1105-2-100 *Planning Guidance Notebook* (22 April 2000)
- Engineering Regulation 200-2-2 *Procedures for Implementing NEPA* (33 CFR 230)
- Engineering Regulation 1110-2-1302 *Engineering and Design - Civil Works Cost Engineering* (31 March 1994)
- Engineering Regulation 1110-2-1806 *Engineering and Design - Earthquake Design and Evaluation for Civil Works Projects* (1995)
- USACE Policy Guidance Letter No. 40 *Development and Financing of Dredged Material Management Studies*
- USACE Policy Guidance Letter No. 56 *Section 207 of the Water Resources Development Act of 1996, Beneficial Use of Dredged Material*

- USACE Policy Guidance Letter No. 59 *Recreational Development at Ecosystem Restoration Projects*
- Engineering Manual 1110-2-1100 *Coastal Engineering Manual – Part 1 through Part V* (30 April 2002)
- Engineering Manual 1110-2-5027 *Engineering and Design - Confined Disposal of Dredged Material* (1987)
- Engineering Manual 1110-2-1902 *Slope Stability* (2003)
- Engineering Manual 1110-1-1904 *Settlement Analysis* (1990)
- Engineering Manual 1110-2-1906 *Laboratory Soils Testing* (1986)
- Engineering Circular 1105-2-210 *Ecosystem Restoration in Civil Works Programs*

State of Maryland Compliance

- Maryland Environment Act
- Water Quality Certification (COMAR 26.08.02.10)
- Tidal Wetlands License (COMAR 26.24)
- Sediment and Erosion Control (COMAR 26.17.01)
- Stormwater Management (COMAR 26.17.02)
- Water Appropriation and Use (COMAR 26.17.06)
- Oil Control Program (COMAR 26.10)
- Maryland Coastal Zone Management Program
- Critical Area Act
- Chesapeake Bay Critical Area Program (COMAR 27.02)
- Nongame and Endangered Species Conservation Act
- Natural Heritage Program (COMAR 08.02.12, 08.03.08)
- Maryland Historical Trust (MHT) / State Historic Preservation Officer (SHPO) (COMAR 05.08)
- Water Quality Improvement Act of 1998
- Maryland's Conservation Reserve Enhancement Program
- Economic Growth, Resource Protection, and Planning Act
- Maryland Environmental Policy Act
- Maryland Environmental Trust
- Dredged Material Management Act of 2001

1.8 OTHER PROJECTS

1.8.1 Navigation Projects

1.8.1.a Baltimore Harbor and Channels Federal Navigation Project The Baltimore Harbor and Channels Federal navigation project was authorized by the River and Harbor Act of August 8, 1917, and modified by the River and Harbor Acts of January 21,1927; July 3, 1930; October 7, 1940; March 2, 1945; July 3, 1958; and December 31, 1970.

The existing navigation project includes a main channel, 50-ft deep, between Cape Henry, Virginia, and Fort McHenry at Baltimore. The authorized dimensions of the channels are as follows:

1. Cape Henry Channel (Figure 1-6): The Cape Henry Channel is authorized to a depth of 50-ft MLLW and a width of 1,000-ft from the 50-foot depth curve in the Atlantic Ocean to that depth in the Chesapeake Bay. The Cape Henry Channel is approximately three miles long.

2. York Spit Channel (Figure 1-6): The York Spit Channel is authorized to a depth of 50-ft MLLW and a width of 1,000-ft, connecting the 50-foot depth curves in the Chesapeake Bay opposite the York River near York Spit. The York Spit Channel is constructed to a width of 800-ft and is 18.4 miles long.

3. Rappahannock Shoal Channel (Figure 1-6): The Rappahannock Shoal Channel is authorized to a depth of 50-ft MLLW and a width of 1,000-ft, connecting the 50-foot depth curves in the Chesapeake Bay opposite the Rappahannock River. The Rappahannock Shoal Channel is constructed to a width of 800-ft and is 10.3 miles long.

4. Craighill Approach Channel to Fort McHenry: This series of channels is authorized to a depth of 50-ft MLLW and a width of 800 ft. However, the channels are constructed to 700 ft wide, widened at the entrance and bends, from the 50-foot depth curve in the Chesapeake Bay opposite the mouth of the Magothy River to Fort McHenry on the Patapsco River, a distance of 20.7 miles.

   (a) Craighill Entrance (Figure 1-3): The Craighill Entrance Channel is 3.6 miles long, 700-ft wide, and authorized to a depth of 50-ft MLLW.
   (b) Craighill Channel (Figure 1-3): The Craighill Channel connects the Craighill Entrance with Craighill Angle, and is approximately 3.2 miles long, 700-ft wide, and authorized to a depth of 50-ft MLLW.
   (c) Craighill Angle (Figure 1-3): The Craighill Angle is approximately 1.8 miles long, ranges in width from 700 to 1,830-ft, and is authorized to a depth of 50-ft MLLW.
   (d) Craighill Upper Range (Figure 1-3): The Craighill Upper Range is approximately 2.4 miles long, 700-ft wide, and authorized to a depth of 50-ft MLLW.
   (e) Cutoff Angle (Figure 1-3): The Cutoff Angle connects the Craighill Upper Range to Brewerton Channel, and is approximately 1.1 miles long, ranges in width from 700 to 1,650-ft, and is authorized to a depth of 50-ft MLLW.
   (f) Brewerton Channel (Figure 1-7): The Brewerton Channel is located within the Patapsco River and is approximately 3.4 miles long, 700-ft wide, and authorized to a depth of 50-ft MLLW.
   (g) Brewerton Angle (Figure 1-7): Brewerton Angle connects the Brewerton Channel and the Fort McHenry Channel, and is approximately 1.0 mile long, ranges in width from 700 to 1,375-ft, and is authorized to a depth of 50-ft MLLW.

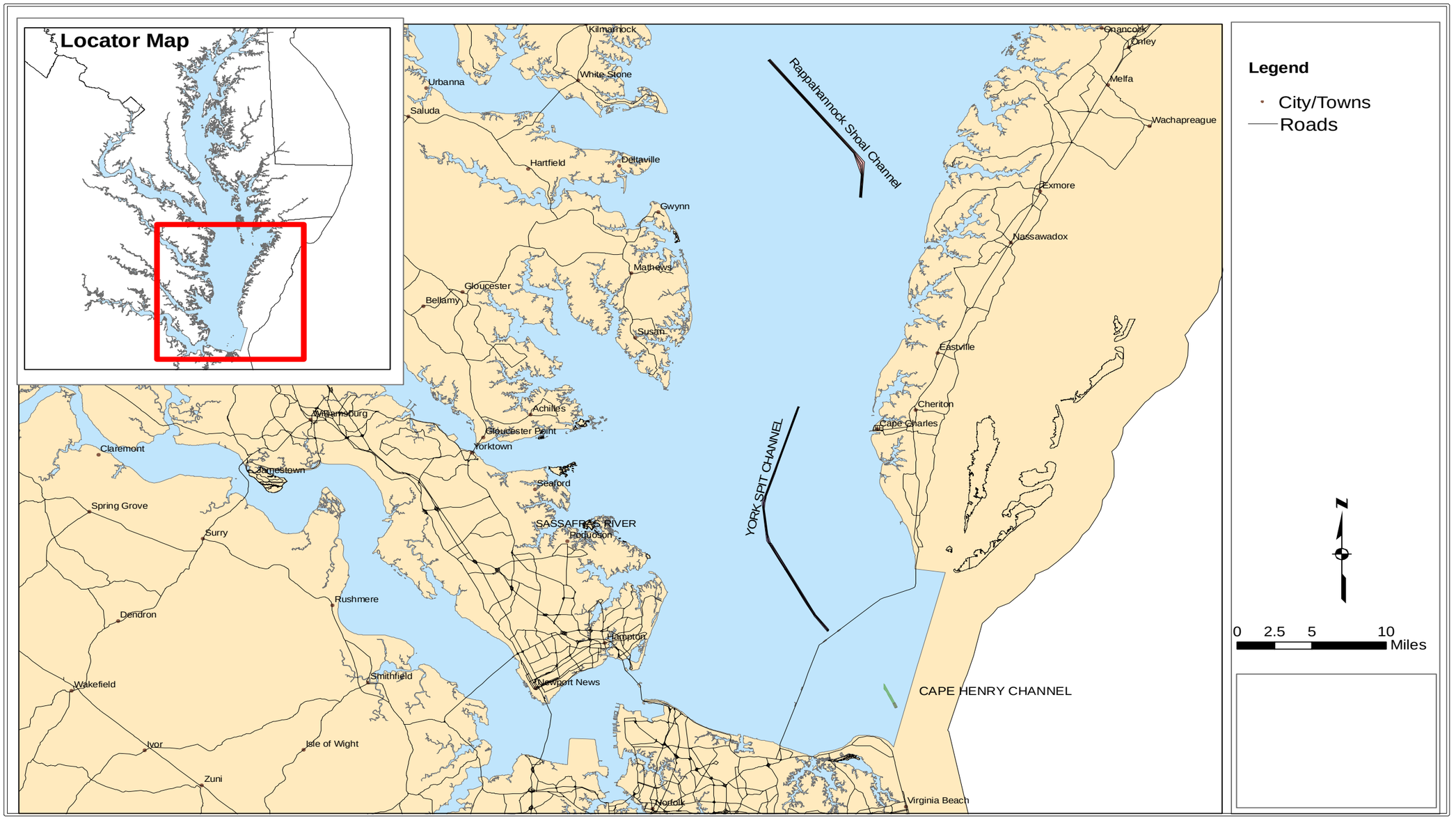

Figure 1-6. Approach Channels to the Port of Baltimore located in Virginia Portion of the Chesapeake Bay

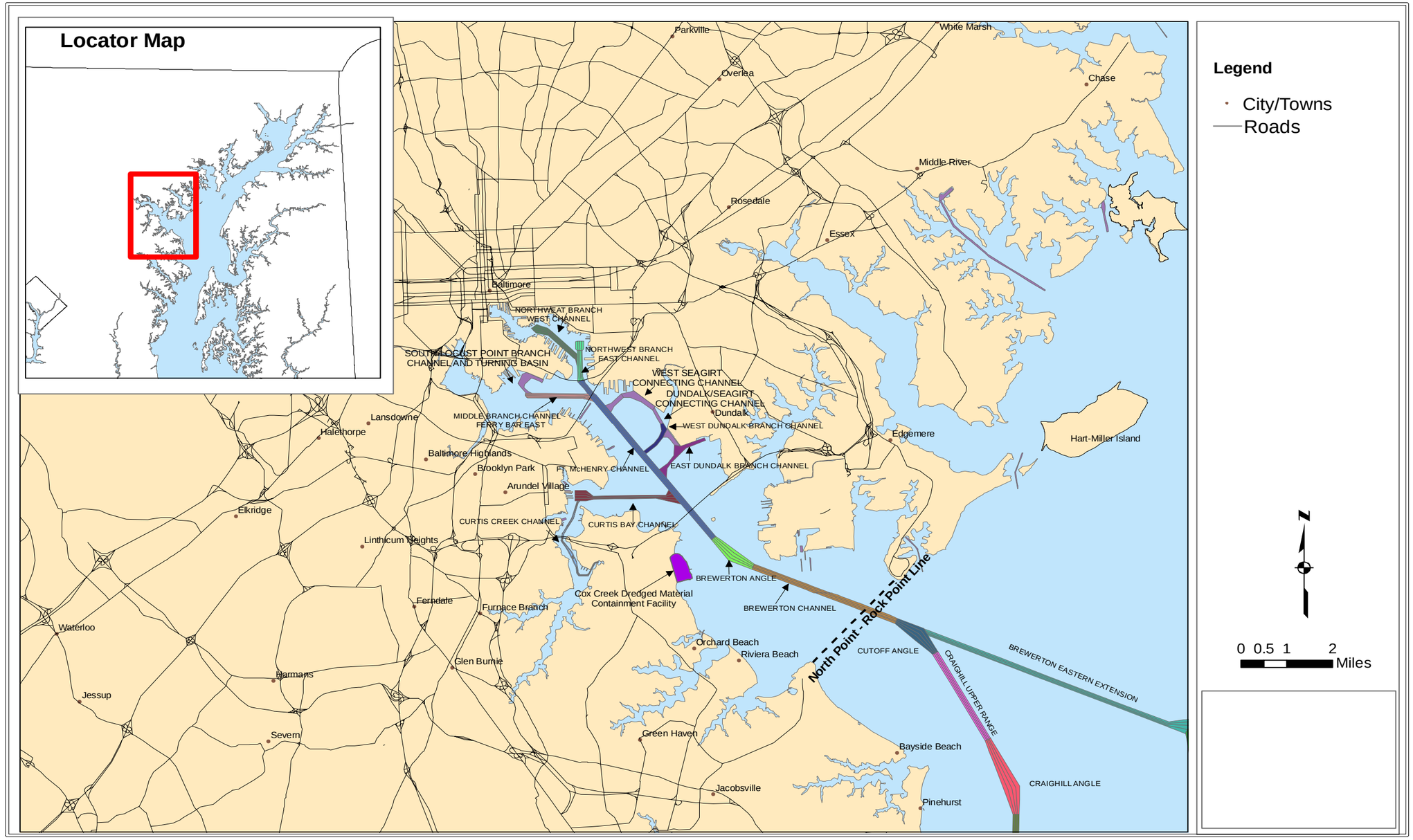

Figure 1-7. Baltimore Harbor Channels

5. Fort McHenry Channel (Figure 1-7): The Fort McHenry Channel is approximately 4.2 miles long, 700-ft wide, and authorized to a depth of 50-ft MLLW. The Fort McHenry Channel is the main channel in the Patapsco River.

The existing navigation project also authorizes a series of branch channels that provide access to the various public and private terminals serving the Port of Baltimore and that connect the main channel with the C&D Canal. The dimensions of the branch channels are as follows:

1. Connecting Channel to C&D Canal Approach Channel: This series of channels are authorized to a depth of 35-ft MLLW, a width of 600-ft, and are approximately 15.6 miles long from the Cutoff Angle in the main channel to the 35-foot depth curves in the natural channel on the east side of the Chesapeake Bay, which is part of the inland waterway from the Delaware River to the Chesapeake Bay. The connecting channel includes the Brewerton Channel Eastern Extension, and the Swan Point and Tolchester Channels.

   (a) Brewerton Channel Eastern Extension (Figure 1-3): The Brewerton Channel Eastern Extension is approximately 6.3 miles long, 600-ft wide, and is authorized to a depth of 35-ft MLLW.
   (b) Swan Point Channel (Figure 1-3): Swan Point Channel is approximately 2.8 miles long, 600-ft wide, and is authorized to a depth of 35-ft MLLW.
   (c) Tolchester Channel (Figure 1-3): Tolchester Channel connects with the Brewerton Channel Eastern Extension, and is approximately 7.2 miles long, 600-ft wide, and is authorized to a depth of 35-ft MLLW.

2. Curtis Bay Channel (Figure 1-7): Curtis Bay Channel is authorized at 600-ft wide (constructed to 400-ft wide), 50-ft deep, and 2.2 miles long from the main channel to, and including, a 1,275-foot-wide turning basin at the head of Curtis Bay. Curtis Bay Channel is authorized to a depth of 50-ft MLLW.

3. Curtis Creek (Figure 1-7): Curtis Creek Channel is a total of approximately 2.3 miles long, and includes three channel reaches and two basins, as described below:

   (a) The lower reach of the Curtis Creek Channel is authorized to a depth of 35-ft MLLW and a width of 200-ft, from the 50-foot channel in Curtis Bay to 750 ft downstream of the Pennington Avenue Bridge, a distance of 0.9 mile.
   (b) The middle reach of the Curtis Creek Channel is authorized to a depth of 22-ft MLLW and a width of 200-ft from the 35-foot channel to, and along, the marginal wharf of the Curtis Bay Ordnance Depot.
   (c) An irregularly shaped basin 18-ft deep and 320-ft wide, adjacent to the head of the 22-foot channel, a distance of 600-ft.
   (d) A basin 15-ft deep and 450-ft wide, from the end of the 22-foot channel to the end of the marginal wharf, a distance of 0.2 mile.
   (e) The upper reach of the Curtis Creek Channel is authorized to a depth of 22-ft MLLW and a width of 200-ft, from the 22-foot channel of the CSX Rail Transport bridge to the vicinity of Arundel Cove, a distance of 2,800 ft, then 100-ft wide in

Arundel Cove for a distance of 2,100 ft, with an anchorage basin 700-ft square adjacent to the channel and southwest of the wharf of the Coast Guard Depot at Curtis Bay.

4. Middle Branch (Ferry Bar East Section) (Figure 1-7): The Ferry Bar East Section of the Middle Branch is authorized to a depth of 42-ft MLLW and 600-ft wide, from the main channel at Fort McHenry to Ferry Bar, a distance of 1.4 miles. NOTE: The West Ferry Bar and Spring Garden Sections of the existing project were deauthorized by Section 1001 of the WRDA of 1986, PL 99-662.

5. Northwest Branch (Figure 1-7):

   (a) East Channel: The East Channel connects to the Fort McHenry Channel and is authorized to a depth of 49-ft MLLW, a width of 600-ft, and is 1.3 miles long with a 950-foot-wide turning basin at the head of the channel.
   (b) West Channel: The West Channel is authorized to a depth of 40-ft MLLW, a width of 600-ft, and is 1.3 miles long, with a 1,050-foot-wide turning basin at the head of the channel.

1.8.1.b Baltimore Harbor Anchorages and Channels Project The Baltimore Harbor Anchorages and Channels Project was authorized by Section 101a(22) of the Water Resources Development Act (WRDA) 1999 and provides for:

1. The Dundalk West Channel (Figure 1-7): The Dundalk West Channel is authorized to a depth of 42-ft MLLW, a width of 500-ft wide, and is approximately 3,800 ft long, with widening at the bends and entrances.

2. The Seagirt West Channel (Figure 1-7): The Seagirt West Channel is authorized to a depth of 42-ft MLLW, a width of 500-ft wide, and is approximately 5,600 ft long, with widening at the bends and entrances.

3. The Seagirt-Dundalk Connecting Channel (Figure 1-7): The Seagirt-Dundalk Connecting Channel is authorized to a depth of 42-ft MLLW, a width of 500-ft wide, and is approximately 2,500 ft long, with widening at both ends;

4. The East Dundalk Channel (Figure 1-7): The Dundalk East Channel is authorized to a depth of 38-ft MLLW, a width of 400-ft wide, and is approximately 3,800 ft long, with widening at the bends and entrances.

5. The South Locust Point Channel (Figure 1-7): The South Locust Point Channel is authorized to a depth of 36-ft MLLW, a width of 400-ft, and is approximately 5,600 ft long, with widening at the bends and entrances.

6. Deepening of Anchorage #3 to 42-ft MLLW for a width of 2,200 ft and a length of 2,200 ft, and an additional length of 1,800 ft and width of 1,800 ft. The remaining

portion of Anchorage #3, just west of the improved areas, will remain at its currently authorized depth of 35-ft MLLW, for a width of 1,500 ft and a length of 300 ft;

7. Deepening of Anchorage #4 to 35-ft MLLW for a width of 1,800 ft and a length of 1,800 ft;

8. A turning basin at the head of the Fort McHenry Channel, 1,200 ft wide by 1,200 ft long, and a depth of 50-ft MLLW.

9. Deauthorization of Anchorage #1.

10. Federal assumption of maintenance of the existing Seagirt Marine Terminal, Dundalk Marine Terminal, and South Locust Point Marine Terminal channels, exclusive of berthing areas, and Federal maintenance of a 42-foot depth (MLLW) in the area between the Connecting Channel and the proposed Seagirt Marine Terminal Berth 4 upon completion of dredging to that depth by the State of Maryland.

1.8.1.c Inland Waterway, Delaware River to Chesapeake Bay, Delaware and Maryland, Chesapeake and Delaware (C&D) Canal Project The Chesapeake and Delaware Canal Project authorizes maintenance of the approach channels to the C&D Canal. The C&D Canal Project is under the jurisdiction of USACE-Philadelphia District, and was adopted as House Document 63-196 in 1919 and modified by Section 3 of the River and Harbor Act of 1927, by River and Harbor Committee Document 71-41 and Senate Document 71-151 in 1930, by House Document 72-201, House Document 73-18, and House Document 73-24 in 1935, and Senate Document 83-123 in 1954.

The approach channels to the C&D Canal extend approximately 30 miles from Town Point near the western end of the C&D Canal southwest to the vicinity of Pooles Island. The project provides a channel 35-ft deep (MLLW) and 450-ft wide from the Delaware River through Elk River and the Chesapeake Bay, to water of natural 35-ft depth in the Chesapeake Bay. The southern approach channels to the C&D Canal extend approximately 15 nautical miles from the mouth of the Sassafras River southwest to the natural 35-ft contour of the Chesapeake Bay (Figure 1-4) near Pooles Island.

1.8.1.d Other Federal Navigation Channels Other Federal navigation channels that require periodic maintenance dredging which are located between the William Preston Lane, Jr. Memorial Bridge (Bay Bridge) and the Virginia State line include (Figure 1-8):

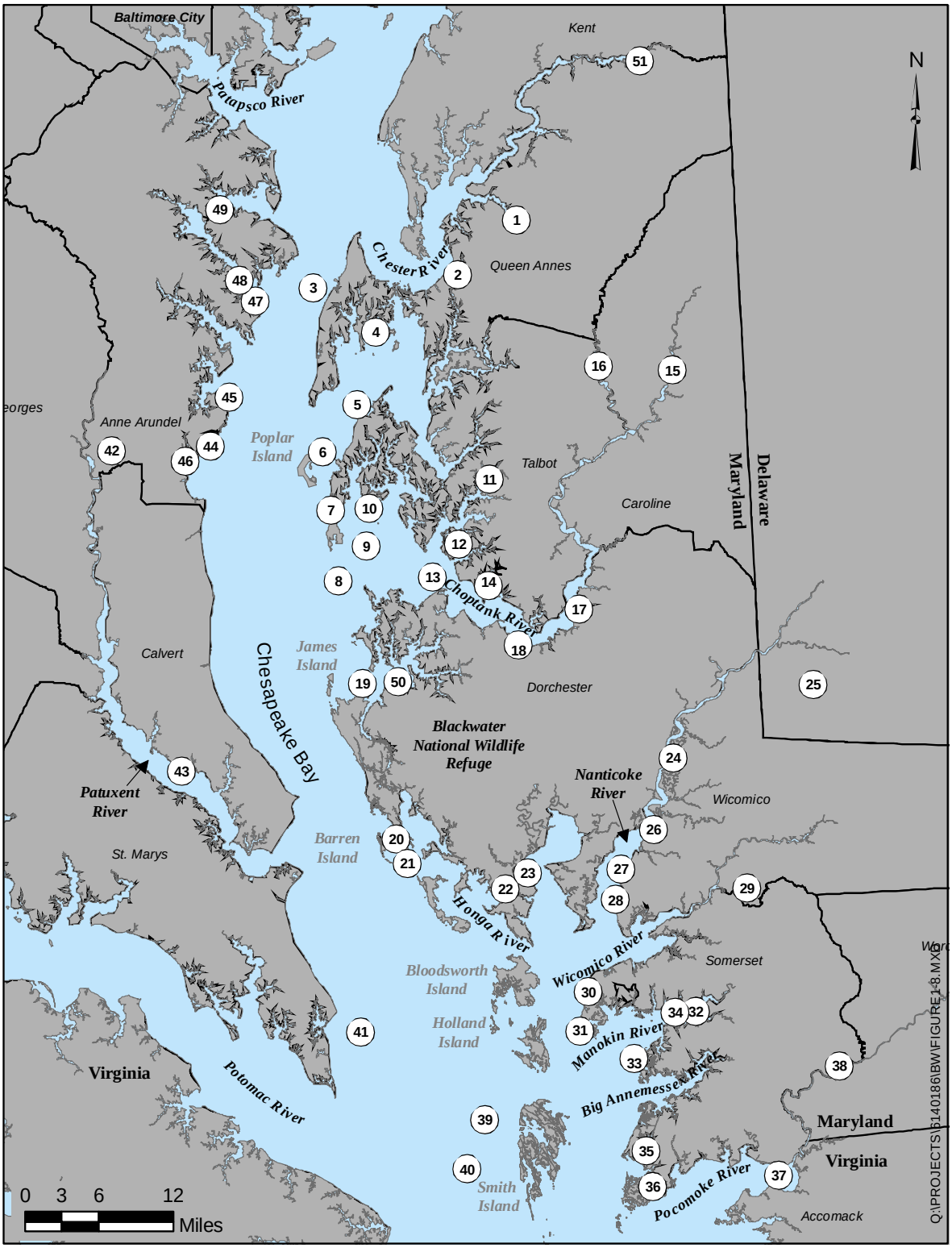

Figure 1-8. Other Federal Navigation Channels Located between the William Preston Lane, Jr. Memorial Bridge (Bay Bridge) and the Virginia State Line ***(numbers on map correspond to list of channel projects in Section 1.8.1.d)***

Eastern Side of the Bay: ***(numbers in bold correspond to map of channel projects in Figure 1-8)***

- Black Walnut Harbor **(8)**
- Broad Creek **(36)**
- Broad Creek River **(25)**
- Cambridge Harbor **(18)**
- Chester River (just to north of Bay Bridge) **(51)**
- Choptank River **(15)**
- Claiborne Harbor **(5)**
- Corsica River **(1)**
- Crisfield Harbor **(35)**
- Duck Point Cove **(22**)
- Fishing Bay **(23)**
- Goose Creek **(33)**
- Honga River and Tar Bay **(20)**
- Island Creek **(13)**
- Knapps Narrows **(7)**
- La Trappe River **(14)**
- Little Creek **(3)**
- Lower Thorofare **(31)**
- Lowes Wharf **(6)**
- Madison Bay **(50)**
- Manokin River **(32)**
- Muddy Hook and Tyler Coves **(21)**
- Nan Cove **(43)**
- Nanticoke River at Nanticoke **(28)**
- Nanticoke River At Bivalve **(27)**
- Nanticoke River **(24)**
- Neavitt Harbor **(10)**
- Pocomoke River **(37)**
- Queenstown Harbor **(2)**
- Rhodes Point To Tylerton **(40)**
- Shad Landing State Park **(38)**
- Slaughter Creek **(19)**
- St. Michaels **(4)**
- St. Peters Creek **(34)**
- Tilghman Island Harbor (Dogwood Harbor) **(9)**
- Town Creek **(12)**
- Tred Avon River **(11)**
- Tuckahoe River **(16)**
- Twitch Cove and Big Thorofare River **(39)**
- Tyaskin Creek **(26)**
- Upper Thorofare **(30)**
- Warwick River **(17)**
- Wicomico River **(29)**

Western Side of the Bay: ***(numbers in bold correspond to map of channel projects in Figure 1-8)***

- Annapolis Harbor **(48)**
- Back Creek **(47)**
- Cypress Creek **(49)**
- Fishing Creek **(44)**
- Herring Bay and Rockhold Creek **(45)**
- Parish Creek **(46)**
- Patuxent River **(42)**
- St. Jerome Creek **(41)**

1.8.2 Ecosystem Restoration Projects

1.8.2.a Mid-Chesapeake Bay Island Ecosystem Restoration Study The Integrated EIS and Feasibility Study for Mid-Chesapeake Bay Island Ecosystem Restoration is one of the seven alternatives recommended for additional study by the Federal DMMP (USACE, 2005). It is estimated that 10,500 acres of island habitat have been lost in the middle-eastern portion of Chesapeake Bay in the last 150 years as a result of land subsidence, erosion and sea-level rise. Additionally, it is estimated that within the next 10 to 20 years most of the existing island habitats will be completely eroded and lost to the Bay. The Mid-Chesapeake Bay Island Ecosystem Restoration study focused on restoring hundreds of acres of aquatic and

wildlife island habitat in the Mid-Chesapeake Bay region through the beneficial use of dredged materials from the Port of Baltimore channels.

Through the beneficial use of dredged material, restored islands could be constructed to replace hundreds of acres of wetland and upland habitat. The restoration of this valuable habitat will improve productivity of the surrounding area, and provide an environmentally sound method for the use of dredged material removed from Bay channels. The purpose of the Mid-Chesapeake Bay Island Ecosystem Restoration Study is to determine the technical, economic, and environmental feasibility of protecting, restoring, and creating aquatic, intertidal wetland, and upland habitat for fish and wildlife at Mid-Chesapeake Bay Islands, specifically James Island and Barren Island (Figure 1-9), using clean dredged material from the Baltimore Harbor and Channels Federal navigation project.

1.8.2.b Wetland Restoration in Dorchester County (Blackwater Wildlife Refuge)
Wetland restoration at Blackwater National Wildlife Refuge (NWR) in Dorchester County, Maryland (Figure 1-9) is one of the seven alternatives recommended for additional study in the Federal DMMP (USACE, 2005). More than 7,000 acres of tidal marsh in Blackwater NWR have drowned in place or have been lost to erosion since 1940 as a result of sea level rise, hydrologic changes, wildlife damage, and vegetation management practices (USACE, 2002a). In 2001, the USACE, USFWS, and MDNR began investigations to assess the feasibility of restoring several hundred acres of brackish marsh in the Blackwater NWR. The MDNR, the study sponsor, has been involved in the restoration studies under the auspices of the Maryland Marsh Restoration and Nutria Control Project, Public Law (PL) 105-322.

In 2002, as part of the initial feasibility assessment, the USACE-Baltimore District conducted a demonstration project using thin-layer spraying and conventional dredged material placement techniques on approximately 15-20 acres of degraded marsh at Blackwater NWR. Dredged material was used to increase the surface elevation in areas where the marsh was failing or had recently failed and converted to non-vegetated intertidal flats (USACE, 2002a and 2004). Monitoring studies indicated that the marsh plants performed well during their first summer of growth (USACE, 2004). The National Aquarium in Baltimore is continuing to monitor plant performance and site elevations in the restoration demonstration areas

Future ecosystem restoration efforts at Blackwater NWR are necessary and important for several reasons: the Blackwater marsh system is of great regional ecological significance; tidal marsh losses have been extensive and are likely to have regional ecologically detrimental consequences; human activities have contributed to marsh losses; and the tidal marshes will not recover without human intervention. The project proposed in the Federal DMMP consists of placement of approximately 2-ft of dredged material (totaling approximately 6 mcy) over approximately 1,000 acres of degraded wetlands at Blackwater. The dredged material would be hydraulically pumped into temporary containment (earthen berms) in the areas proposed for restoration. The proposed restoration at the Blackwater NWR would create positive impacts to wetlands, water birds, and water quality. It is anticipated that the design process for this alternative would be initiated following completion of planning and design for the Mid-Chesapeake Bay Island Ecosystem Restoration Study.

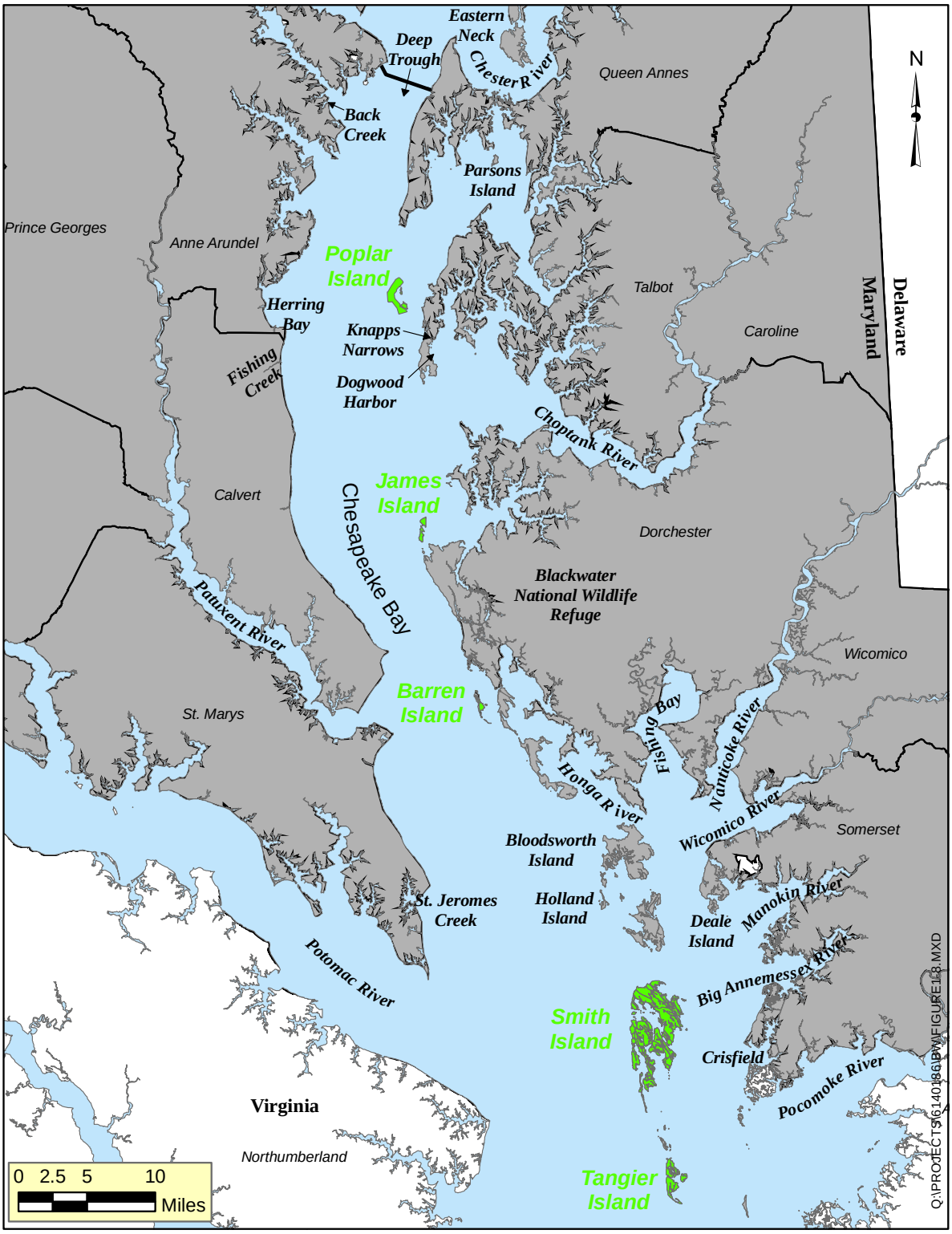

Figure 1-9. Location of Mid-Chesapeake Bay Islands

1.8.2.c Smith Island (MD) Ecosystem Restoration Project Smith Island is located in Somerset County, Maryland (Figure 1-9). Smith Island is part of a chain of islands that form the border between Chesapeake Bay and Tangier Sound, and is comprised of 97 percent emergent wetlands. The study area is within the largest contiguous SAV bed in the Bay. Although SAV coverages have been rebounding in the last decade throughout the Bay, Tangier Sound area has seen continual decreases in SAV coverage primarily as a result of erosion. As Smith Island erodes, wave and current action into previously protected quiescent and shallow-water areas that are suitable for SAV growth has increased. The erosion of Smith Island adds sediment to the water column; resultant turbidity inhibits SAV colonization and growth. Valuable wetland habitat is also being lost as Smith Island erodes, because the Smith Island remnants are extremely high quality emergent wetlands.

In its entirety, Smith Island has lost over 3,300 acres of wetlands in the last 150 years, and, in the identified project areas alone, it lost almost 2,400 acres of SAV between 1992 and 1998. The recommended project consists of constructing a total of 19,000 ft of offshore, segmented breakwaters to protect and recreate the strategic areas along the western and northern shorelines of the Martin National Wildlife Refuge. The project is estimated to protect 216 acres of wetlands and 540 acres of SAV over a 50-year lifespan, while creating or restoring 24 acres of wetlands and 1,440 acres of SAV. A reconnaissance study was completed in May 1997 and a feasibility study was completed in May 2001. The plans and specifications were completed in July 2003 (100% design). The project cannot proceed to construction without construction authorization and appropriate funding.

1.8.2.d Tangier Island (VA) Aquatic Ecosystem Restoration Study Tangier Island is located in the Chesapeake Bay approximately 90 miles southeast of Washington, D.C., and is located in Accomack County on Virginia's Eastern Shore (Figure 1-9). The waters in the vicinity of the Tangier formerly had among the most extensive and dense SAV in the entire Chesapeake Bay. Today, these waters still have considerable SAV, but losses have been severe. SAV is the primary nursery habitat for blue crabs (*Callinectes sapidus*) in the bay and is an important nursery and foraging habitat for a variety of finfish and shellfish species. The first part of the feasibility phase, culminating with the Preliminary Restoration Plan, was approved in October 2001. The second part of the feasibility phase, culminating with the Detailed Project Report (DPR), was initiated in March 2002. The Draft DPR was submitted in September 2004 and included a tentatively selected plan consisting of six offshore breakwaters along the western side of the northern half of the island and one offshore breakwater at the northern tip of the island. The primary benefits of the project would be to protect about 359 acres of wetland and 196 acres of SAV beds and restore about three acres of wetland and 178 acres of SAV beds. It is expected that the additional SAV beds would increase both blue crab juveniles and adults by approximately 47.5 percent when compared to the current population. There would also be benefits to the finfish, shellfish, and waterfowl populations. This study is currently and indefinitely pending additional funds.

1.8.2.e Eastern Shore Reconnaissance Study In accordance with Section 905(b) of the WRDA of 1996, the Baltimore District conducted a reconnaissance study of the Maryland and Delaware portions of the Delmarva Peninsula lying within the Chesapeake Bay watershed. Subsequently, a Section 905(b) Analysis (dated 31 July 1999) was prepared that assessed the

water resources problems and needs of the watershed areas. The Eastern Shore, MD and DE Section 905(b) Analysis was conducted within an ecosystem management framework and considered aquatic and riparian habitat restoration; dredged material management; wetland restoration, creation, and protection; navigation; shoreline and streambank erosion control; flood control; water quality improvements; and hurricane protection for the Eastern Shore, MD and DE (USACE, 1999). The study determined that the regional large-scale loss of wetlands to agriculture and development was among the paramount water resources issues within the study area. The study identified several projects that were within the Federal interest and thus, recommended for further detailed feasibility-level study, although a feasibility-level study has not occurred to date because of a lack of cost-share interest in the project.