CHAPTER 1: PURPOSE AND NEED FOR ACTION

***Chapter Outline*:**

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1.1 The Proposed Action: Environmental Restoration of the New Bedford Harbor Environment

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund," 42 U.S.C. §9601 *et seq.*) provides a mechanism for addressing the Nation's hazardous waste sites, allowing states and the Federal Government to sue polluters for the clean-up and restoration of designated sites. CERCLA provides for the designation of "natural resource trustees:" Federal, state, or tribal authorities who represent the public interest in natural resources. Natural resource trustees may seek monetary damages (*i.e.*, compensation) from polluters for injury, destruction, or loss of natural resources resulting from releases of specified hazardous substances. These damages, which are distinct from clean-up costs, must be used by the trustees to "restore, replace, or acquire the equivalent of" the natural resources that have been harmed, but only after the trustees have approved a restoration plan. The trustees are required to involve the public in the development of the restoration plan (42 U.S.C. §9607(f)(1) and §9611(I); 40 C.F.R. §300.600; 43 C.F.R. §11.93).

The sediments, water column and biota of New Bedford Harbor, Massachusetts, are highly contaminated with polychlorinated biphenyls (PCBs) as a result of industrial discharges into the Harbor and nearby coastal environments in western Buzzards Bay. As a result, the U.S. Environmental Protection Agency (EPA) designated New Bedford Harbor a Superfund Site under CERCLA in 1983. In 1991 the New Bedford Harbor Trustee Council (NBHTC or Trustee Council) was formed, composed of the Commonwealth of Massachusetts, the U.S. Department of Commerce, and the U.S. Department of Interior.

The Trustee Council proposes undertaking environmental restoration in New Bedford Harbor and the surrounding environment in order to: (1) restore natural resources injured by PCB releases; (2) restore the habitats of living resources and the ecological services that the resources provide; (3) restore human uses of natural resources, such as fisheries and public access; and (4) improve aspects of the human environment of New Bedford Harbor that have been degraded by the Harbor contamination (NBHTC, 1993).

The proposed environmental restoration would incorporate public and professional opinion to develop, evaluate, and select specific and general restoration alternatives. The result would be a range of selected restoration alternatives that together would form the basis of an estuary-wide plan to restore the affected environment.

Selected alternatives would consist of near-term, future, or emergency restoration actions. Chapter 5 discusses the process of evaluation and selection of restoration alternatives. This document evaluates the restoration program as a whole, as well as specific near-term restoration actions. Emergency actions (if necessary) and future restoration actions would be evaluated through future rounds of restoration project selection, coordinated with the Superfund clean-up over the next 15 years. Selected actions would be implemented by the Trustee Council or its designees, including agency staff and advisors, the Commonwealth of

Massachusetts, local governments, or non-governmental entities. Monitoring and evaluation would be undertaken to assess the effectiveness of selected alternatives. Chapter 5 presents an estimated timetable and milestones for selection and implementation of future restoration actions as clean-up of the New Bedford Harbor Environment proceeds.

In order to satisfy the requirements of the National Environmental Policy Act (NEPA, 42 U.S.C. §4321 *et seq.*), the Trustee Council intends to combine the restoration planning process with the development of an Environmental Impact Statement (EIS). This document, therefore, constitutes a Draft Restoration Plan and EIS (RP/EIS) for New Bedford Harbor, Massachusetts, under CERCLA, 42 U.S.C. §9601 *et seq.*, and NEPA, 42 U.S.C. §4321 *et seq.*

While the contamination of New Bedford Harbor and its clean-up have important implications for human health, the primary focus of this document is on the restoration of natural resources, and resource uses, affected by the contamination of New Bedford Harbor. Cleanup decision-making is a separate process, ongoing under the leadership of the U.S. Environmental Protection Agency. Chapter 2 discusses the relationship between cleanup and restoration activities in New Bedford Harbor and provides more information on the legal framework, and required scope, of natural resource restoration in the New Bedford Harbor Environment.

1.2 Need for the Proposed Action: Injury to Natural Resources

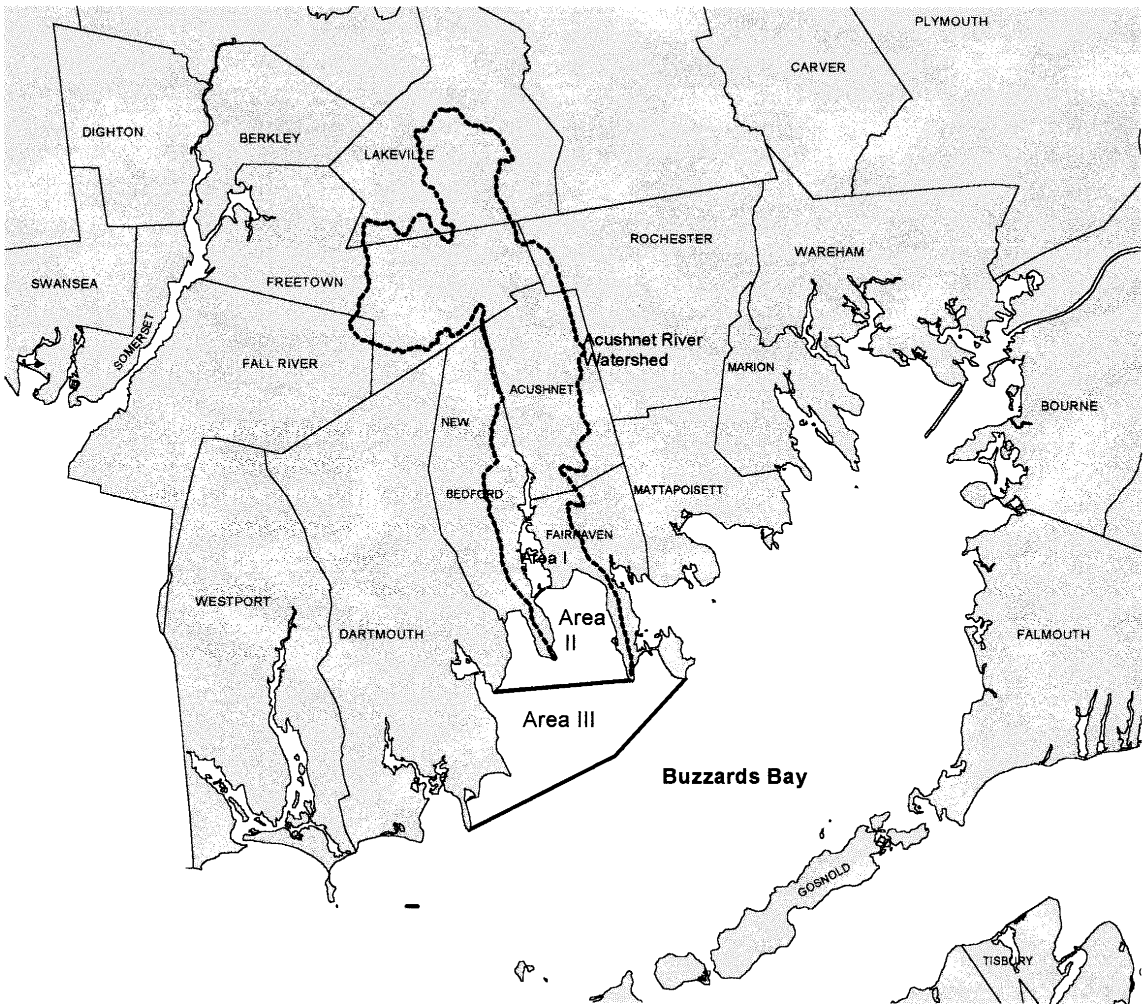
1.2.1 Site History: Contamination of New Bedford Harbor

New Bedford Harbor is an urban tidal estuary on Buzzards Bay, in southeastern Massachusetts **(Figures 1.1 and 1.2)**. From the late 1940s until 1977, when the use of PCBs was banned in the U.S., manufacturers of electrical parts in New Bedford discharged PCBs directly and indirectly, via the municipal wastewater treatment system, into the New Bedford Harbor Estuary. PCBs are a class of chlorinated organic compounds that are suspected human carcinogens. They have been shown to be harmful to many species, capable of causing reproductive failure, birth defects, and death. PCBs tend to “biomagnify” up the food chain, accumulating in the tissues of top predators such as gamefish, birds, and humans (60 F.R. 10836).

A series of studies conducted from 1974-1982 found high levels of PCBs and toxic metals (particularly cadmium, chromium, copper and lead) to be widespread in the water, sediments, and marine life of New Bedford Harbor. Levels of PCBs in the Harbor biota were found to exceed what was then the U.S. Food and Drug Administration (FDA) guideline of 5 parts per million (ppm) (subsequently lowered to 2 ppm). As a result, the Commonwealth closed the Inner Harbor to all fishing, and the Outer Harbor to the taking of certain species in September, 1979. Section 3.5 details these fishing closures and their effects.

In the late 1980s and early 1990s, studies further described the distribution of PCBs and toxic metals throughout the New Bedford Harbor Estuary and in parts of Buzzards Bay (Pruell et al., 1990). PCB concentrations in marine sediment in the Estuary were found to range from a few parts per million to over 200,000 ppm, while concentrations in excess of 50 ppm were found in

Figure 1-1



New Bedford Harbor Environment
Acushnet River Watershed south to
Area II

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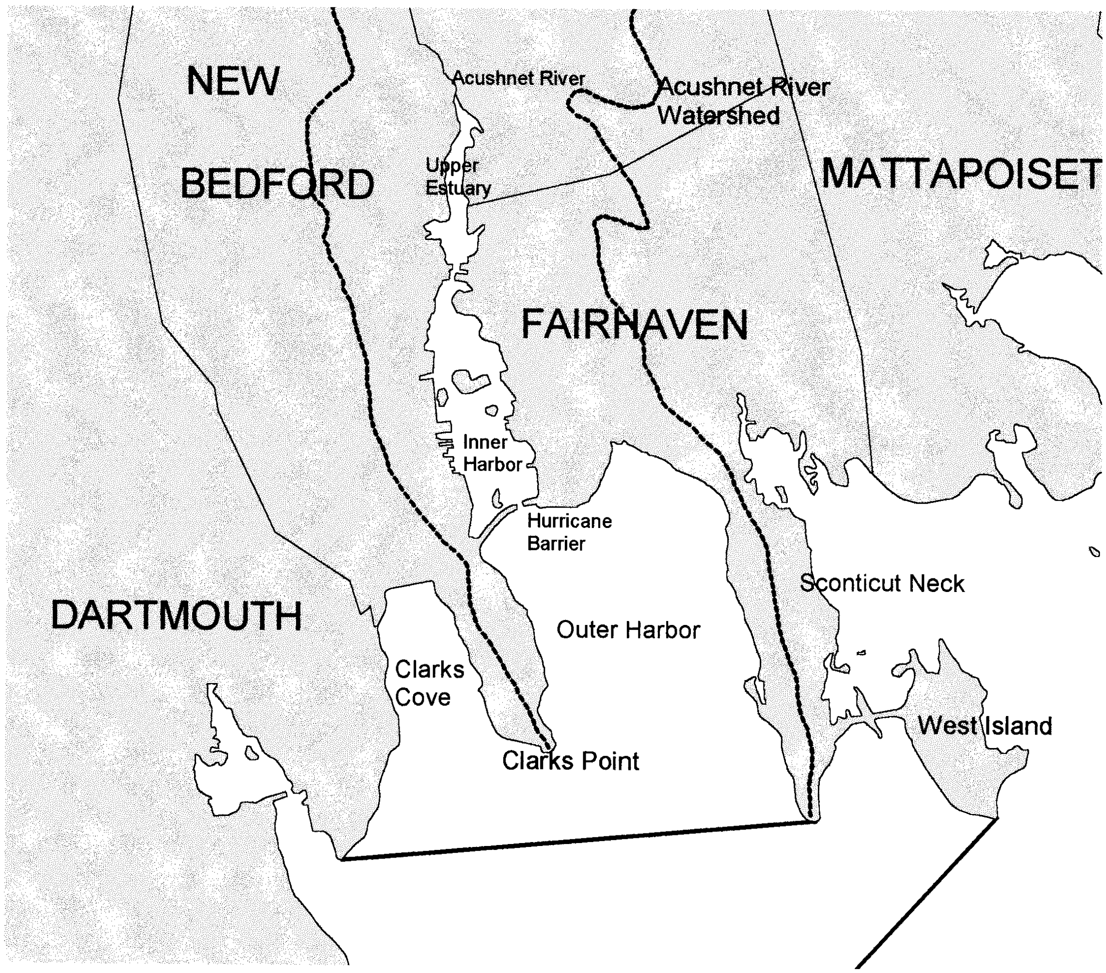
Figure 1-2



New Bedford Harbor

New Bedford Harbor Trustee Council
RP/EIS

parts of Outer New Bedford Harbor. PCB concentrations in the water column were found to exceed Federal ambient water quality criteria (AWQC) (0.030 ppm, based on chronic impacts to marine organisms) (60 F.R. 10836). Section 3.5 describes the distribution of contaminants in the New Bedford Harbor Environment.

In 1983, New Bedford Harbor was designated a Superfund Site, eligible for Federal clean-up action, or "remediation." In addition, Massachusetts has identified New Bedford Harbor as the Commonwealth's priority Superfund site. As a result of settlements in 1991 and 1992 with the Federal Government and the Commonwealth of Massachusetts, the manufacturers responsible for the contamination paid approximately $100 million for remediation and restoration of New Bedford Harbor, of which approximately $21 million must be used by the Trustee Council for restoration of natural resources. Chapter 2 describes legal and financial aspects of the proposed restoration as well as complementary efforts to address the contamination of New Bedford Harbor.

1.2.2. Superfund Site Remediation

Remediation is ongoing at the New Bedford Harbor Superfund Site. Between 1994 and 1995, EPA and the U.S. Army Corps of Engineers (Corps) dredged the most contaminated sediments ("the Hot Spots") from the Harbor, into a "confined disposal facility" or CDF near Sawyer Street, New Bedford. This Hot Spot material will be treated later. While the dredging is directed at removing PCBs, areas contaminated with the highest heavy metal concentrations will also be removed. Due to the size and difficulty of the job, the remediation process is expected to take approximately fifteen years, until about 2011. This process is described more fully in Chapters 2 and 5.

Chapter 3 discusses pre-remediation levels of PCBs in the New Bedford Harbor Environment as well as expected levels and rates of ecosystem recovery following the cleanup. Most of the Upper Acushnet River Estuary will be dredged; thus post-remediation levels of PCBs in the sediments there are expected be less than 10 ppm. An exception is the salt marshes of this area, where PCB concentrations up to 50 ppm will remain. Inner New Bedford Harbor, between Coggeshall Street and the Hurricane Barrier, will also be dredged to an action level of 50 ppm, leaving in place sediment PCB concentrations from 0-50 ppm. Significant concentrations of toxic metals (cadmium, chromium, copper, and lead) can also be expected to remain in the Inner Harbor once clean-up is complete.

1.2.3 Likelihood of Ecosystem Recovery

Superfund Site remediation in New Bedford Harbor will greatly reduce PCBs and toxic metals in the sediments, waters and biota of the New Bedford Harbor Estuary. EPA has informally estimated that it may take some years after completion of the remediation for the Harbor's water quality to meet EPA's target levels for PCBs, placing that portion of recovery squarely into the next century (Dickerson, PC, 1996). However, since PCBs and metals will remain in some portions of the Harbor sediments, and due to the exceptional persistence of these substances, it is probable that the ecosystem will not have fully recovered until some time after those target levels have been met.

The environmental persistence of the New Bedford Harbor contaminants is such that they may recirculate in the living component of the Harbor ecosystem for many decades. In Lake Michigan, reductions in sources of PCBs resulted in initial declines in environmental concentrations, followed by a leveling-off or stabilization above AWQC, with the most toxic forms of PCBs persisting in the environment (VHB, 1996). While it is impossible to predict the amount of time it will take the New Bedford Harbor Environment to recover from environmental releases of contaminants, it may be many years after completion of remediation until PCBs in the biota of New Bedford Harbor stabilize at lower levels.

While the Superfund clean-up will reduce the environmental and human health risks associated with the Harbor contamination, the remediation is not without its own environmental impacts. One of the most important of these stems from the siting of CDFs and long-term storage of contaminated sediments along the Harbor shoreline. While the size, extent, and location of the CDFs have not been finalized, it is certain that, following the clean-up, CDFs will become a significant feature of the Harbor shoreline **(Figure 5.2)** and, where sited on areas that are currently open water, will cause a limited amount of marine habitat loss.

1.2.4 Injury to Natural Resources: Overview

Discharges of PCBs to the New Bedford Harbor Environment have caused significant ecological injury. Widespread contamination of the air, water, sediments and biota of the New Bedford Harbor Estuary has resulted in lethal effects for some species as well as widespread sub-lethal effects such as reduced biological diversity, alteration of biotic communities, and reproductive impairment of marine species.

Contamination of New Bedford Harbor by PCBs has resulted in economic losses, as well, through closure of fishing grounds, lost use of beaches, and loss of environmental quality. Injury to the ecology and economy of New Bedford Harbor from PCB releases is discussed in detail in Section 3.5.

Finally, the contamination has affected the New Bedford area in less tangible ways, eroding the quality of the human environment. The effects of the contamination on the New Bedford area’s quality of life are discussed in Section 3.5.

As noted in the preceding section and in Section 3.5, the Superfund Site remediation of New Bedford Harbor will remove <u>85% to 90%</u> of the PCB contamination from New Bedford Harbor. It will not, however, restore the New Bedford Harbor Environment to its pre-contamination condition. Lower, but still significant, levels of PCBs and metals will remain in the marine sediments of some Harbor areas. CDFs will occupy significant areas of shoreline alongside New Bedford Harbor.

<u>Also present is contamination from other sources such as combined sewage overflows, wastewater treatment plant discharges, industrial wastewater discharges, and boats. The Superfund designation of this site was based primarily on the PCB releases from industrial discharges at two locations and not on these other sources.</u> Further action is necessary to help restore the ecology and economy of the area, and to compensate public and private users of marine resources for lost use during the period of elevated contaminant levels.

1.3 Purpose of the Proposed Action: Restore Injured Natural Resources and Lost Uses

The purpose of the proposed action--natural resource restoration in New Bedford Harbor--is to restore, replace or acquire the equivalent of natural resources injured by PCB releases in New

Bedford Harbor, as required by CERCLA (42 USC §9607(f)(1)). Restoration actions would thereby accelerate and enhance recovery of the ecosystem, the ecological services provided by the ecosystem, and associated human uses.

In order to accomplish this goal, restoration of natural resources would strive to enhance the entire Harbor ecosystem by implementing a series of actions directed at a range of natural resources. The cumulative effect of these actions would be to improve the functioning and productivity (ecological and economic) of the system as a whole. The proposed restoration of New Bedford Harbor would target four broad areas of natural resource restoration: (1) restore natural resources injured by PCB releases; (2) restore the habitats of living resources and the ecological services that they provide; (3) restore human uses of natural resources, such as fisheries and public access; and (4) improve aspects of the human environment of New Bedford Harbor that have been degraded by the Harbor contamination (NBHTC, 1993).

In order to assess the potential environmental impacts of the restoration, the Trustee Council will consider the affected environment to include the lands of the Acushnet River watershed, the waters of the Acushnet River and New Bedford Harbor, and parts of Buzzards Bay, as well as uses of this environment -- ecological as well as human -- extending beyond these boundaries. However, since the injury primarily affected marine and coastal resources, the proposed restoration focuses on the resources of the New Bedford Harbor Estuary and adjacent coastal areas. **Figures 3.1 and 3.2** describe the geography of the affected environment, which is discussed more fully in Section 3.1.

Several potential approaches are available to restore the natural resources of New Bedford Harbor; these are described below. Moreover, a single restoration action could employ several of these approaches in combination.

1.3.1 Restoration of Injured Natural Resource Populations

One potential approach to restoring natural resources injured by PCBs in New Bedford Harbor is restoration at the population level. An example is <u>replenishing</u> shellfish with hatchery-grown seed, a measure that has proven effective in reestablishing shellfish populations elsewhere in Southern New England. Such restoration could help rebuild a valuable commercial or recreational fishery that, if well-managed, could prove self-sustaining.

Populations can also be restored indirectly, through species-specific habitat restoration. An example might be restoration of anadromous fish runs by improving fish-ladders at existing dams to increase available spawning habitat for herring, alewives and shad. Resulting increases in the abundance of these species would benefit recreational, commercial, and bait fisheries directed at these species. Moreover, ecosystem-wide benefits might be expected, since these fish are important forage species for sportfish such as bluefish and striped bass, wading and diving birds, and birds of prey.

1.3.2 Restoration of Injured Habitats and Ecological Services: Acceleration of Ecological Recovery

A second potential approach to restoring natural resources, as well as the ecological services they provide, is habitat restoration. Habitats of importance to the New Bedford Harbor Environment are discussed in Section 3.3; these include several types of wetlands, beaches, tide flats, benthic (subtidal) areas, woodlands, and the water column itself. Habitat enhancement or replacement might include restoration of salt marshes, seagrasses, or other wetlands, or preservation or protection of valuable habitats, such as natural coastal areas, that might otherwise be developed.

A good example of the link between habitat restoration and the provision of ecosystem services is salt marsh restoration. Coastal salt marshes are critical to the biology of coastal ecosystems, providing habitat for a variety of life-stages of fish, shellfish, birds, and other organisms, as well as serving important chemical and physical functions in the estuarine environment (NOAA, 1991). In New England, however, the construction of roads or railways across salt marshes has often resulted in reduced tidal flushing, changes in species composition, and, ultimately, lower habitat values for birds and fish. A simple hydrologic restoration that enlarges the culverts beneath the road can restore former species distributions, with benefits for commercial and recreational fisheries as well as birdwatchers and other non-consumptive ecosystem users.

Habitat restoration can also significantly accelerate the recovery of organisms, populations, and habitats that have been harmed by the contamination of the New Bedford Harbor Estuary. PCBs in the Estuary have reduced biological diversity, impaired reproduction, and in some cases caused direct mortality of marine organisms. Habitat restoration -- whether directed at wetlands, seagrass beds, or other coastal habitats -- can increase plant and animal biodiversity.
By providing spawning and nursery habitat for fish and other fauna, habitat restoration can accelerate the reproductive recovery of species whose fecundity may have been depressed by the contamination. To the extent that these species interact with the larger ecosystem, through trophic transfer, for example, or as food sources for other animals throughout the estuary, such actions can accelerate ecological recovery of the entire ecosystem.

Species-specific restoration actions--whether habitat restoration, or restoration of injured populations--can also help accelerate ecological recovery. For example, terns have been poisoned by eating baitfish from New Bedford Harbor; restoration of these birds' nesting habitat can help recover a population directly affected by the Harbor contamination. Populations of shellfish, if sufficiently dense, have been shown to improve water quality.

By using an approach that combines restoration of injured natural resource populations and habitat restoration, and species-specific action, natural resource restoration in the New Bedford Harbor Environment can substantially improve the ecosystem health of an estuary that has been severely affected by PCB contamination.

1.3.3 Restoration of Lost Use

Natural resource restoration can restore lost human use of natural resources, as well. Restoration of lost use may pertain to consumptive uses, such as fishing, shellfishing, and duckhunting, or non-consumptive uses like swimming, birdwatching, recreational walking, and aesthetic enjoyment.

Consumptive uses that might be restored include inshore fisheries. Restoration of inshore fish and shellfish species, through action at the population or habitat level, would restore an historically important use of the Harbor Environment, providing significant economic and cultural benefits.

Non-consumptive human uses of the New Bedford Harbor Environment can be restored in a variety of ways. The improvement of coastal parks or walkways, for example, could restore public access lost because the Harbor was undesirable or inaccessible in its contaminated state. Wetlands restoration could improve the aesthetics of degraded areas. And restoration of birds, through habitat restoration or restoration of prey species, could improve the aesthetics of the Harbor Environment while restoring lost use to birdwatchers.

1.3.4 Restoration of Quality of Life

The quality of the human environment is inextricably linked to that of the natural environment (PCSD, 1996). By restoring natural resources along with their uses and values, restoration in New Bedford Harbor could have economic and non-economic benefits. The enhanced economic prosperity, recreational opportunity, and aesthetic enjoyment that could be expected to result from natural resource restoration has the potential to significantly improve the quality of the human environment in the greater New Bedford metropolitan area and related environments, such as Buzzards Bay.

1.4. Coordination of Restoration with Remediation

Restoration of the New Bedford Harbor environment will have to be coordinated with the process of remediation, since the restoration options available at a particular time would be largely dependent on the status of the Harbor environment and clean-up. Water and sediment quality, ongoing dredging and construction activities, and the location and extent of CDFs will influence the possibilities for restoration. The Trustee Council, therefore, envisions a flexible restoration planning process, based on a combination of emergency, near-term, and future restoration actions. The process would make use, over a number of years, of a series of public solicitations for restoration ideas. Since EPA's remedial action is expected to take approximately 15 years, the Trustee Council anticipates a restoration process of similar duration. As clean-up of the Harbor proceeds, more restoration options would become available. Chapter 5 discusses coordination of restoration and remediation in greater detail.