Draft Restoration Plan
and
Environmental Assessment
Rose Hill Landfill Site
Hazardous Substance Release

Public Review Draft

October 2011

Prepared by the:
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Restoration Center
28 Tarzwell Drive, Narragansett, Rhode Island 02882

EXECUTIVE SUMMARY

This Draft Restoration Plan and Environmental Assessment (Draft RP/EA) has been prepared by the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce and presents the agency's restoration planning process to address natural resource injuries caused by releases of hazardous substances at or from the Rose Hill Landfill Superfund Site located in South Kingstown, Rhode Island (hereafter, "the Site"). NOAA seeks public review and comment on the preferred alternatives proposed to be implemented by the agency to address the natural resource injuries resulting from Site releases.

The Rose Hill Landfill Superfund Site is located in the Town of South Kingstown. The Town of South Kingstown owned and operated the Site from 1967 to 1983. In 1973, the Town of Narragansett entered into an agreement with the Town of South Kingstown, whereby Narragansett also used and operated the landfill. Therefore, the two towns are the Responsible Parties (RPs) that are jointly and severally liable for natural resources damages resulting from the release or threatened release of hazardous substances at or from the Site.

Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), NOAA and the Rhode Island Department of Environmental Management (RIDEM) share trusteeship authority over the natural resources affected by releases at or from the Site and are collectively referred to as the Natural Resource Trustees ("the Trustees"). See, 42 USC § 9607(f)(2).

Under CERCLA, the Trustees are authorized to act on behalf of the public to assess and recover damages for injury to, destruction of, or loss of natural resources caused by the release, or threatened release, of hazardous substances, and to hold responsible parties liable for those damages including the costs of assessing the damages (42 USC 9607). Natural resource trustees ensure that funds recovered from responsible parties are used to, "restore, replace or acquire the equivalent," of the natural resources that were injured and ecological services that were lost." See, 42 USC § 9607(f) (1).

NOAA and RIDEM worked together to investigate and assess potential natural resource injuries attributable to releases at or from the landfill. The Trustees determined that natural resources in the Saugatucket River ecosystem were injured by the release of hazardous substances at or from the Site.

In December 2002, the U.S. Environmental Protection Agency (USEPA) and the federal and state Trustees entered into a Consent Decree with the Towns of South Kingstown and Narragansett settling claims under CERCLA related to the existence, release, or threat of release of hazardous substances at or from the Site. Under the terms of the Consent Decree, the RPs are required to perform remedial activities, pay natural resource damages, and perform or fund restoration activities to settle their liability under CERCLA. Federal and state natural resource damage claims were addressed separately in the Consent Decree.

Per the terms of the Consent Decree, the funds are to be used by NOAA for "…the implementation and monitoring of fish passage restoration projects on the Saugatucket River."

The state independently developed and provided oversight of restoration projects that the RPs have completed to resolve their liability for the State natural resource damage claim.

Section IX of the Consent Decree specifically requires the RPs to provide $117,000 to NOAA to be used for "…the implementation and monitoring of fish passage restoration projects on the Saugatucket River" to resolve their environmental liability for the federal natural resource damage claim. In this Draft RP/EA, NOAA presents the restoration project alternatives that the agency identified and evaluated to address the natural resource injuries for which NOAA is the sole federal Trustee.

NOAA has identified and evaluated four compensatory restoration alternatives, including a "No Action" alternative, to restore and/or enhance diadromous fish populations to the Saugatucket River. The targeted diadromous fish species include alewife (*Alosa pseudoharengus*) and blueback herring (*A. aestivalis*), collectively known as river herring, and American eel (*Anguilla rostrata*). The alternatives considered in this Draft RP/EA include: (1) a 'No Action' alternative; (2) modifications to the Main Street Dam and reconstruction of the associated fishway in Wakefield, RI to improve upstream and downstream diadromous fish passage; (3) modifications to the Palisades Manufacturing Company Dam and accompanying fishway in Peace Dale, RI, to improve upstream diadromous fish passage; (4) and replacement of a road culvert to improve diadromous fish passage on Factory Brook in Charlestown, RI.

NOAA is proposing the Main Street dam and Palisades dam fish passage improvements as the preferred restoration alternatives. These projects, collectively present the most significant resource benefit to the natural resources of the Saugautcket River watershed that were injured by contaminant releases from the Rose Hill Superfund Site.

Actions undertaken by NOAA to restore natural resources or services are subject to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, and the regulations guiding its implementation at 40 C.F.R. Parts 1500 through 1517. NEPA and its implementing regulations outline the responsibilities of federal agencies when preparing environmental documentation. In general, federal agencies contemplating implementation of a major federal action must produce an environmental impact statement (EIS), if the action is expected to have significant impacts on the quality of the human environment. If there is uncertainty as to whether the proposed action would likely have significant impacts, federal agencies are to prepare an environmental assessment (EA) to evaluate the need for an EIS. If the EA demonstrates that the proposed action will not significantly impact the quality of the human environment, the agency issues a Finding of No Significant Impact (FONSI), which satisfies the requirements of NEPA, and no EIS is required. For a proposed restoration plan, if a FONSI determination is made, the Trustee(s) may then issue a Final Restoration Plan describing the selected restoration action(s) to be implemented.

Pursuant to NEPA, NOAA has prepared this Draft RP/EA, in which the agency presents a reasonable number of restoration alternatives that the agency identified and evaluated to address the natural resources injuries arising from the Site. NOAA considered all reasonably foreseeable potential negative or beneficial impacts associated with each of the alternatives and used the information to propose preferred restoration alternatives for implementation. NOAA does not

believe that the proposed restoration actions will significantly impact the quality of the human environment.

The Draft RP/EA summarizes information on the environmental setting; briefly describes the assessment process relating to injury to or loss of natural resources or ecological services; describes the purpose and need for restoration actions; identifies alternative actions; assesses their applicability and potential direct, indirect or cumulative impacts on the quality of the physical, biological and cultural environment; and presents a pathway for public participation in the decision-making process.

This Draft RP/EA is being made available to the public for review and comment for a period of 30 calendar days from the initial date of public notice. The deadline for submitting written comments on the Draft RP/EA is specified in one or more public notices issued by NOAA to announce its availability for public review and comment. Comments are to be submitted in writing via mail, email, or fax to:

Mr. James G. Turek
National Oceanic and Atmospheric Administration
Restoration Center
28 Tarzwell Drive
Narragansett, Rhode Island 02882
Email: James.G.Turek@noaa.gov
Fax: 401-782-3201

NOAA will consider and respond to all written comments received within the comment period prior to developing and publishing the Final Restoration Plan/Environmental Assessment (Final RP/EA). Assuming an Environmental Impact Statement (EIS) will not be necessary, and NOAA determines it is appropriate to implement the proposed preferred restoration alternatives, NOAA will issue a Final RP/EA that will be accompanied by the FONSI. NOAA will then implement the restoration projects to restore the natural resources and services injured by releases from the Site to compensate the public for loss of those natural resources and services.

Table of Contents

List of Figures

1.0 Introduction

1.1 Overview and History of the Site

The Rose Hill Landfill Superfund Site is an approximately 70-acre site located off Rose Hill Road in South Kingstown, Washington County, Rhode Island. The Site is bordered by Rose Hill Road to the west, the Saugatucket River to the east, and residential properties to the north and south. The Town of South Kingstown ("the Town") leased the land as a municipal domestic and industrial waste disposal facility, which the Town operated from 1967 to 1983. In 1973, the Town of Narragansett entered into an agreement whereby Narragansett also used the landfill. Three separate areas on or near the Site received wastes, including a solid waste landfill, a bulky waste disposal area, and a sewage sludge landfill. In 1983, the facility became inactive, and the operator graded and seeded the disposal areas. Currently, the Town owns and operates a transfer station for municipal waste, on a portion of the Site. Current owner-operated activities within the Site's boundary also include a hunting preserve, skeet and qualifying range, kennel and field training area for dogs, and a pet cemetery. An estimated 17,300 people obtain water from wells located within three miles of the Site. The surrounding area is both rural and residential, with forested uplands and wetlands, fields, small farms and sand/gravel mining activities nearby. Mitchell Brook, a small upper perennial stream, flows through the Site before discharging to the Saugatucket River. The Saugatucket River discharges to Pt. Judith salt pond located in Narragansett, Rhode Island. Pt. Judith Pond is one of a number of coastal salt ponds which tidally connect to Block Island Sound along the South County shoreline in southwestern Rhode Island.

1.1.1 Contaminants of Concern

In 1985, the Utilities Department of the Town of South Kingstown extended the municipal water line to residences on Rose Hill Road, where testing of residential water supply wells indicated that contaminants had migrated from the landfill into the local groundwater. The Site was proposed for listing on the National Priorities List on June 24, 1988; and on October 4, 1989, the listing became final. The contamination of nearby drinking water wells triggered further investigations of the landfill by USEPA and RIDEM, and led to the Site being included on the federal Superfund National Priority List. In 1990, USEPA initiated a Remedial Investigation (RI) to determine the nature and extent of contamination and to evaluate any risks to human health and the environment.

The results of the RI revealed a wide array of contaminants in the landfill that included volatile and semi-volatile organics, pesticides, and metals, among others. It was also determined that contamination had migrated into the groundwater, nearby surface waters, and landfill gases. Contamination posed a risk to aquatic organisms in the surface waters from exposure to these chemicals of ecological risk concern. The risk to aquatic organisms was confirmed by results from leachate toxicity testing, which indicated that the leachate is acutely toxic to aquatic organisms including finfish.

1.1.2 Responsible Parties

The Town of South Kingstown leased the land as a municipal domestic and industrial waste disposal facility, which the Town operated from 1967 to 1983. While the Site is located in South Kingstown, the Town of Narragansett entered into an agreement of joint use and operation of the landfill in 1973; therefore both towns are jointly and severally liable for natural resources damages attributable to the Site.

In 1983, the facility became inactive, and the operator graded and seeded the disposal areas. A transfer station for municipal waste, currently owned and operated by the Town of South Kingstown, is located on a portion of the Site. Three separate areas on or near the Site received waste including a solid waste landfill, a bulky waste disposal area, and a sewage sludge landfill.

NOAA and RIDEM determined that natural resources in the Saugatucket River ecosystem were injured by the release of hazardous substances from the Site. In December 2002, the EPA, the Trustees, and the Towns of South Kingstown and Narragansett – the Responsible Parties (RPs) entered into a Consent Decree, settling claims under CERCLA relating to the existence, release, or threat of release of hazardous substances at or from the Site. Under the terms of the Consent Decree, the RPs are required to perform remedial activities, pay natural resource damages, and perform or fund restoration activities to settle their liability under CERCLA.

1.2 Summary of Response Actions

The USEPA's 1999 Record of Decision (ROD) selected a remedy to directly address contaminants in the soils, air emissions, leachates, and public access of the Site, thereby indirectly addressing contaminants migrating to the nearby groundwater, sediments, and surface waters. The remedial activities for groundwater, air and leachate set forth in the 1999 ROD were to: (a) excavate and consolidate the Bulky Waste Area landfill materials at the Solid Waste Area landfill; (b) collect and effectively manage leachate and waters collected from runoff and dewatering operations during the excavation of the Bulky Waste Area; (c) construct a multi-layer clean fill cap over the extent of the Solid Waste Area landfill and consolidated Bulky Waste Area; and inspect and monitor the integrity and performance of the landfill cap over time; (d) assess, control, collect and treat landfill gas emissions and monitor landfill gas concentrations to assess any need to modify the landfill gas collection treatment system as necessary; (e) implement access restrictions and institutional controls (i.e., land title restrictions) on land use and the use of, or hydraulic alteration of, groundwater where Preliminary Remediation Goals (PRGs) and/or other health based standards are exceeded; (f) install a chain link fence and/or other physical barriers where necessary to prevent Site access, injury and/or exposure; (g) conduct long-term monitoring of surface waters, groundwater, air and leachate emergence; (h) perform operation and maintenance activities throughout the life of the remedy; and (i) conduct statutory five-year reviews, as required by the ROD. The Site's remedial design was completed in January 2005. The remedial actions began in 2005 and were completed in 2007.

The selected remedy of groundwater source control is to eliminate the flow of contaminated leachate and groundwater into the Saugatucket River and indirectly help to remediate contaminated sediments in and surface waters of the Saugatucket River.

1.3 Legal Authority

This Draft RP/EA was prepared by NOAA pursuant to the agency's authority and responsibility as a natural resource trustee under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 *et seq*.; the Federal Water Pollution Control Act, 33 U.S.C. § 1251, *et seq*.) (also known as the Clean Water Act or CWA), and other applicable federal laws, including Subpart G of the National Oil and Hazardous Substances Contingency Plan (NCP), at 40 C.F.R. §§ 300.600 through 300.615, and the U.S Department of Interior's CERCLA natural resource damage assessment regulations at 43 C.F.R. Part 11 (Natural Resource Damage Assessment (NRDA) regulations), which provide guidance for the natural resources damage assessment and restoration planning process under CERCLA. Actions undertaken by NOAA to restore natural resources or services are subject to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, and the regulations guiding its implementation at 40 C.F.R. Parts 1500 through 1517.

1.4 Public Participation

NOAA has prepared this Draft RP/EA for public review and comment. In this document, we present information regarding: the role and authority of natural resource trustees and the natural resources damage assessment process; the natural resource injuries and service losses attributable to the Site; the restoration alternatives that NOAA has identified and considered; NOAA's evaluation of the restoration alternatives and the potential environmental impacts on the surrounding environment that could result from implementing the restoration alternative(s); and NOAA's proposed preferred alternative for implementation, and the rationale behind its selection. Public review of this Draft RP/EA is the means by which NOAA seeks public comment on the restoration action that the agency proposes to implement to restore the impacted environment and compensate the public for the natural resources injuries and services losses. As such, it is an integral and important part of the NRDA process and is consistent with all applicable state and federal laws and regulations, including the National Environmental Policy Act (NEPA, 42 U.S.C. 4321 *et seq*.) and its implementing regulations; and the regulations providing guidance on assessment and restoration planning under CERCLA at 43 C.F.R. Part 11.

This Draft RP/EA is being made available for review and comment by the public for a period of 30 calendar days. The deadline for submitting written comments on the Draft RP/EA is specified in one or more public notices issued by NOAA to announce its availability for public review and comment. Comments are to be submitted in writing via mail, email, or fax to:

Mr. James G. Turek
National Oceanic and Atmospheric Administration
Restoration Center
28 Tarzwell Drive
Narragansett, Rhode Island 02882
Email: James.G.Turek@noaa.gov
Fax: 401-782-3201

NOAA will consider all written comments received within the comment period prior to developing and publishing a Final Restoration Plan/Environmental Assessment (Final RP/EA). Assuming an Environmental Impact Statement (EIS) is not necessary, written comments received and NOAA's response to those comments, whether in the form of plan revisions or written explanations, will be discussed and summarized in the Final RP/EA.

1.5 Administrative Record

NOAA has maintained records documenting the information considered and actions taken by the Trustee agency during this assessment and restoration planning process. These records collectively comprise NOAA's Administrative Record (AR) supporting this Draft RP/EA. Public comments submitted on this Draft RP/EA, as well as the Final RP/EA, will be included in the AR for this case. The AR records are available for review by the public. Interested persons can access or view these records at the NOAA/National Marine Fisheries Service, Narragansett Laboratory, at the following address:

National Oceanic and Atmospheric Administration
Restoration Center
28 Tarzwell Drive
Narragansett, Rhode Island 02882
Attention: James Turek
Email: James.G.Turek@noaa.gov
Fax: 401-782-3201

Arrangements must be made in advance to review or obtain copies of these records by contacting the person listed above. Access to and copying of these records is subject to all applicable laws and policies including, but not limited to, laws and policies relating to copying fees and the reproduction or use of any material that is copyrighted.

2.0 Purpose and Need for Restoration

The purpose of the proposed action is to restore natural resources injured, lost, or destroyed due to releases of hazardous substances at or from the Rose Hill Landfill Superfund Site and/or arising from related response actions. Under CERCLA, designated federal and state natural resources trustees are authorized to act on behalf of the public to assess natural resources

damages and provide for the restoration of the injured natural resources and related service losses.

In December 2002, the United States Environmental Protection Agency (USEPA), the RIDEM, NOAA, and the Towns of South Kingstown and Narragansett, as the Responsible Parties (RPs), entered into a Consent Decree settling claims under CERCLA relating to the existence, release, or threat of release of hazardous substances at or from the Rose Hill Landfill Site.

Under the terms of the Consent Decree, the RPs are required to perform remedial activities, pay natural resource damages, and perform or fund restoration activities to settle their liability under CERCLA. Federal and state natural resource damage claims were addressed separately in the Consent Decree. The state independently developed and reviewed restoration projects which have been completed. The RPs provided $117,000 to NOAA in settlement of the federal natural resource damages claim, in addition to $5,000 to NOAA for past damage assessment costs. Per the terms of the Consent Decree, the funds are to be used by NOAA for "…the implementation and monitoring of fish passage restoration projects on the Saugatucket River."

2.1 NEPA Compliance

Actions undertaken by NOAA to restore natural resources or services are subject to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, and the regulations guiding its implementation at 40 C.F.R. Parts 1500 through 1517. NEPA and its implementing regulations outline the responsibilities of federal agencies when preparing environmental documentation. In general, federal agencies contemplating implementation of a major federal action must produce an Environmental Impact Assessment (EIS) if the action is expected to have significant impacts on the quality of the human environment. When it is unlikely that, or uncertain whether, a contemplated action is likely to have significant impacts, federal agencies prepare an Environmental Assessment (EA) to evaluate the need for an EIS. If the EA demonstrates that the proposed action will not significantly impact the quality of the human environment, the agency issues a Finding of No Significant Impact (FONSI), which satisfies the requirements of NEPA, and no EIS is required. For a proposed restoration plan, if a FONSI determination is made, the Trustee(s) may then issue a final restoration plan describing the selected restoration action(s).

In accordance with NEPA and its implementing regulations, this Draft RP/EA summarizes the current environmental setting; describes the assessment of injury to or loss of natural resources or ecological services resulting from a contaminant release; describes the purpose and need for restoration actions; identifies alternative restoration actions; assesses their applicability and potential direct, indirect or cumulative impacts on the quality of the physical, biological and cultural environment; and provides for public participation in the decision-making process. The public input on this Draft RP/EA will be considered by the agency to determine whether preparation of an EIS is warranted prior to selection of the final restoration action.

3.0 The Natural Resource Damages Settlement

The natural resource damage assessment undertaken for the Rose Hill Site was directed at identifying the type and degree of injury to natural resources as a result of contaminant releases from the Site. This was done both to support development and resolution of the Trustees' natural resource damages claim, and to guide and direct the Trustees in choosing and then implementing appropriate restoration.

The injury assessment process can involve both injury evaluation and resource and service loss quantification. To evaluate potential injury to resources, Trustees review existing information, including Site remedial investigation information and published scientific literature. Based on information from these sources and with an understanding of the ecological functions of the terrestrial and aquatic ecosystems at and near the Site, Trustees evaluate injury to natural resources. Multiple factors are considered when making this evaluation, including, but not limited to:

- Specific natural resources and ecological services of concern;
- Evidence indicating contaminant exposure, pathway and injury;
- Mechanisms by which injury occurred;
- Probable type, degree, spatial and temporal extent of the injuries; and
- Types of restoration actions that are appropriate and feasible.

For each resource category (either a group of organisms or a habitat type) that is potentially affected, Trustees identify an exposure pathway linking the injury to releases at, adjacent to, or from a Site, determine whether an injury has occurred or is likely to occur, and identify the extent and magnitude of the injury.

For the Rose Hill Landfill Site, contamination from the Site was determined to pose a threat to natural resources, including NOAA trust resources utilizing Mitchell Brook, the Saugatucket River, and Saugatucket Pond. The primary pathways of contaminant migration from the Site were determined to be groundwater discharge and surface water runoff. Iron and several trace elements were detected at elevated concentrations in surface waters and sediment during the remedial investigations. The leachate seeps located on the perimeter of both the Bulky Waste and Solid Waste Areas were considered to be sources of contamination to surface water bodies.

NOAA and RIDEM evaluated available information regarding releases and threatened releases of hazardous substances at or from the site, and potential natural resource injuries resulting from those releases. The Town of South Kingstown cooperated with NOAA and RIDEM in completing the assessment activities. The parties considered the likelihood that contamination from the Site adversely affected the water column, benthic invertebrates, and sediments of the Saugatucket River. Additionally, the parties agreed that it was likely that diadromous fish, which use the affected habitat for spawning and rearing habitat, were adversely affected. It was thus agreed that improving the passage of diadromous fish to important spawning and rearing habitat in the Saugatucket River would be appropriate compensation for the injuries to this riverine system.

Based on the results of the natural resource injury determination, NOAA negotiated a $122,000 settlement with the Towns of South Kingstown and Narragansett for natural resource damage and natural resource damage assessment costs (U.S. District Court, 2002). The settlement includes $117,000 provided to NOAA that according to the stipulations of the Consent Decree, are to be used "for the implementation and monitoring of fish passage restoration projects on the Saugatucket River". NOAA thus is responsible for implementing one or more passage projects that will benefit fish species such as river herring and American eel to address the injuries resulting from the Rose Hill Landfill Site.

4.0 Affected Environment

This chapter presents a brief description of the physical, biological, and cultural environment for the waterways and ecosystems adjacent to the Rose Hill Landfill Site as required by NEPA (42 U.S.C. Section 4321, et seq.). Natural resource injuries occurred within the Saugatucket River basin. Restoration activities will occur within the same area or nearby coastal watershed with similar conditions.

4.1 The Physical Environment

The Saugatucket River drains a 12-square mile watershed in the Towns of South Kingstown, Exeter, and North Kingstown, Rhode Island, and discharges to Pt. Judith Pond, a semi-enclosed estuary connected to Block Island Sound. Two primary waterbodies are present on the Saugatucket River: Saugatucket Pond, approximately 35 acres in area and Indian Lake, approximately 220 acres in area. Saugatucket Pond is 2.0 river miles upstream of Pt. Judith Pond, while Indian Lake is 2.1 river miles upstream of Saugatucket Pond. A third, smaller waterbody, but located the furthest downstream, is formed by the Main Street Dam in the village of Wakefield, approximately 0.6 miles upstream of Pt. Judith Pond. The Saugatucket River and its waterbodies and wetlands provide important ecological functions, including fish and wildlife habitat; vascular plant primary production; production export; riverbank stabilization; and sediment transport and trapping, supporting the Pt. Judith Pond and South County estuary complex ecosystem.

4.2 The Biological Environment

The Saugatucket River watershed includes riverine and lacustrine habitats for various fish and wildlife species. Wildlife such as waterfowl (black duck, common mallard), wading birds (blue heron), shorebirds (greater yellowleg), mammals (muskrat, raccoon, red fox), and herpetofauna (wood frog, garter snake) are endemic species. Resident warmwater fish such as chain pickerel, bluegill, largemouth bass, and pumpkinseed; and coolwater fish such as tessellated darter, fallfish and white sucker are commonly found in the Saugatucket River and its associated water bodies. Brown and rainbow trout are also seasonally stocked in the Saugatucket River by RIDEM's Division of Fish and Wildlife and support an active recreational fishery.

A river herring run exists in the Saugatucket River that consists of both alewife and blueback herring. Adult herring return to the Saugatucket River each spring to spawn, and juvenile

herring remain in the river system until late summer to early fall, when the young fish out-migrate to downstream coastal and marine waters. RIDEM maintains only qualitative records on the run period and peak run size, and no quantitative data are available on the present or historical run size of either species. In 2009 and 2010, large numbers of river herring were present below the Main Street dam, and are likely attributed to the "jumpstart" stocking (healthy fish relayed from another nearby river system with a healthy fish population) by RIDEM of alewife released into Indian Lake, beginning in 2005. American eel (*Anguilla rostrata*) is also found in the Saugatucket River. Juvenile eels (*i.e.*, glass eels) migrate from their natal marine spawning grounds, returning to the Saugatucket River to spend much of their juvenile lives ("yellow eels") in the river and freshwater ponds accessible to the eels. No quantitative data exist on the numbers of American eel present in the Saugatucket River watershed, although fishery biologists believe that they have historically been common in the watershed. Their current passage at the Main Street dam and the Palisades dam is considered to be very limited.

4.3 The Cultural and Human Environment [1]

The original town of King's Town, incorporated in 1674, included the present towns of South Kingstown, North Kingstown and Narragansett. It was in this area that the Narragansett Indians hunted, fished, raised corn and held forth against the rival Niantic Indians. The first settlement was in South Kingstown, and it was there in the Great Swamp Fight, in 1675, that colonial soldiers from Rhode Island, Massachusetts and Connecticut gave King Philip his greatest defeat. Farming was the main activity in early times. Flax was among its earliest products. By 1800, the Wakefield Manufacturing Company was in operation, as well as the Peace Dale Mill, which grew to be one of the town's largest industries. The founding of the Rhode Island College of Agriculture and Mechanic Arts in 1892, near the Village of Kingston, was an important milestone in the history of the town. Growing into the present University of Rhode Island, this institution plays a major role in both the economic and cultural life of the town. Recently, diversified small industry has replaced the town's former leading textile manufacturer. The J.P. Stevens Company, for many years operated the Peace Dale Mill, until the textile industry declined, soon after the end of World War II. A drive for additional new industrial growth is currently underway. Capitalizing on its exceptional shoreline and beach areas, the South Kingstown has also experienced significant residential expansion, and development of its summer resort and tourist facilities. South Kingstown now includes substantial residential development and commercial development within the central business districts in the Villages of Wakefield and Peace Dale.

[1] The information in this section is from www.riedc.com

4.4 Threatened and Endangered Species

Per the Endangered Species Act (ESA), any potential federal actions must take into account adequate protection of federally-listed species. While no federally listed species are known to be present within the study area, occasional transient bald eagle (*Haliaeetus leucocephalus*) may be found in the area during seasonal migrations, and may be observed occasionally in Rhode Island coastal areas. The shortnose sturgeon (*Acipenser brevirostrum*) is a federally-listed endangered species that may on rare occasions be found in coastal Rhode Island waters. The alewife and blueback herring, that annually utilize freshwater streams and rivers for spawning migrations, are considered as ESA federal 'species of concern' throughout their range, including the Saugatucket River, and are the target species being addressed by this RP/EA. Rainbow smelt (*Osmerus mordax*), an adadromous species that is locally found in New England coastal waters, including nearshore Rhode Island waters, is also designated as a 'species of concern'. The 'species of concern' status does not carry any procedural or substantive protections under the ESA, although this designation has been assigned since NMFS has some concerns regarding status and threats to the species, but for which insufficient information is available to indicate a need to list the species under the ESA. For further information on ESA status of alewife, blueback herring, and rainbow smelt, please refer to: www.nmfs/noaa.gov/pr/species/fish.

4.5 Essential Fish Habitat

The Magnuson-Stevens Act (including 1996 amendments) strengthened the ability of the National Marine Fisheries Service (NMFS) and the New England Fishery Management Council, Mid-Atlantic Fishery Management Council, and South Atlantic Fishery Management Council to protect and conserve the habitat of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. This habitat is termed "essential fish habitat" and is broadly defined by NMFS to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The Act requires the Councils to describe and identify the essential habitat for the managed species, minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. The Act also establishes measures to protect EFH. The NMFS must coordinate with other federal agencies to conserve and enhance EFH, and federal agencies must consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH. Additionally, NMFS must provide recommendations to federal and state agencies on such activities to help conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency.

According to the NMFS Essential Habitat web site (http://www.nero.noaa.gov/hcd/) query and NMFS consultation, the Saugatucket River watershed is not utilized as EFH by any federally-managed species. A summary of the 34 finfish and shellfish species identified by NMFS under designation of EFH habitat for the Rhode Island/Narragansett Bay area can be found at the following web address: www.nero.noaa.gov/hcd/ri1.html.

5.0 The Restoration Planning Process

The objective of the restoration planning process is to identify restoration alternatives to restore, rehabilitate, replace, or acquire natural resources and their services equivalent to natural resources injured or lost as a result of the release of hazardous substances. The restoration planning process may involve two components: primary restoration and compensatory restoration.

Primary restoration involves actions designed to assist or accelerate the return of natural resources and services to their pre-injury or baseline levels. In contrast, compensatory restoration actions are actions taken to compensate for interim losses of natural resources and services, pending the return of the natural resources and their services to baseline conditions or levels.

For the Rose Hill Landfill injury, remedial actions undertaken at the Site are expected to protect natural resources in the vicinity of the Site from further or future harm and allow the affected natural resources to return to pre-injury or baseline conditions within a reasonable period of time.

As appropriate on-site restoration and mitigation was implemented as part of the remedial actions at the Site, it was unnecessary for the Trustees to plan for and implement primary restoration. Accordingly, this Draft RP/EA addresses only compensatory restoration.

5.1 Restoration Strategy

Because contaminants from the Rose Hill Landfill potentially impacted diadromous fish and their spawning habitat in the Saugatucket River, and because the terms of the Consent Judgment specify that NOAA will undertake fish passage restoration in the Saugatucket River, NOAA sought restoration alternatives that would benefit these species and their habitat within the watershed. The fish spawning and rearing habitat injury (*i.e.*, injury to the surface waters and sediments of the Saugatucket River) began at the time of Site releases and continued until remedial actions at the Site were completed in 2007. Compensatory restoration will serve to make the public whole for resources lost between the time the injury began and completion of the remedial actions at the Site. Restoring the same or ecologically similar resources within the same watershed or in close proximity as the injured communities can provide compensation for the interim loss of ecological services.

To identify and evaluate restoration alternatives, NOAA conducted a site identification and selection process using the best available information from local, state and federal sources. NOAA identified and evaluated four restoration alternatives in its restoration planning process for the Rose Hill Landfill Site including a 'No Action' alternative required under NEPA.

With the No Action alternative, NOAA would take no direct action to restore the natural resource injuries or compensate for lost services pending environmental recovery, and so would rely only on natural recovery and resource management conditions to occur. The No Action Alternative is the primary restoration alternative that all other alternatives are compared to.

Through the RP/EA process, NOAA must decide if the cost and effort of implementing compensatory restoration is more beneficial to the injured resource than simply allowing the injured area to recover on its own.

5.2 Evaluation Criteria

Consistent with the NRDA regulations, NOAA used the following criteria to evaluate the restoration project alternatives and identify the project preferred for implementation under this plan:

The extent to which each alternative is expected to meet the Trustees' restoration goals and objectives: The primary goal of any compensatory restoration project is to provide a level and quality of resources and services comparable to those lost due to the assessed injuries. In meeting the goal, trustees consider the potential relative productivity of the habitat to be restored and whether the habitat is being created or enhanced. Proximity to the injury and future management of the restoration site are also criteria considered since management issues can influence the extent to which a restoration action meets its goals.

The cost to carry out the alternative: The benefit of a project relative to its cost is a primary factor in evaluating restoration alternatives. Factors that can affect and increase the costs of implementing the restoration alternatives may include project timing, access to the restoration site (*e.g.*, with heavy equipment or for public use), acquisition of state or federal regulatory permits, acquisition of land necessary to complete a project, measures necessary to provide for long-term protection of the restoration site, and the potential liability from project construction.

The likelihood of success of each project alternative: Trustees consider technical factors that represent risk to successful project construction, project function, or long-term viability and sustainability of the restored habitat. Alternatives that are susceptible to future degradation or loss through contaminant releases or erosion are considered as less or non viable. Trustees also consider whether difficulties in project implementation are likely, and whether any long-term maintenance of the project features will be or will likely be necessary and/or feasible.

The extent to which each alternative will avoid collateral injury to natural resources as a result of implementing the alternative: Restoration actions should not result in additional losses of natural resources and should minimize the potential to affect surrounding resources during implementation. Projects with no or minimal potential to adversely impact surrounding resources are generally viewed more favorably. Compatibility of the project with the surrounding environment and land use and potential effects on endangered species are also considered.

The extent to which each alternative benefits more than one natural resource or service: This criterion addresses the inter-relationships among natural resources, and between natural resources and the services they provide. Projects that provide benefits to more than one resource and/or yield more beneficial services overall, are viewed more favorably. For example, although recreational benefits are not an explicit objective in this Draft DARP/EA, the potential for a

restoration project to enhance recreational use of an area (e.g., fish viewing or wildlife photography) is considered favorably.

The effect of each alternative on public health and safety: Projects that would negatively affect public health or safety are not appropriate for restoration implementation.

5.3 Tiers of Screening

The NRDA regulations give Trustees discretion to prioritize the above criteria and to use additional criteria as appropriate. In developing this Draft RP/EA, NOAA evaluated alternatives against each criterion to ensure the restoration action(s) will compensate the public for the injuries attributable to the Site releases. The overall goal for restoring the injured natural resources and services is to restore diadromous fish habitats in the Saugatucket River watershed. A secondary, less preferred goal is to restore diadromous fish habitats in other coastal watersheds of the South County salt pond estuary complex, Rhode Island, provided only if no appropriate and feasible projects are available in the Saugatucket River watershed.

5.4 Range of Reasonable Alternatives

Two principal sources of information are available to identify potential projects benefitting diadromous fishes in the Saugatucket River watershed as well as other South County watersheds. Rhode Island has an anadromous fish restoration plan that is available for identifying specific passage restoration sites and actions need to address one or more andromous species (Erkan, 2002). Additionally, the local knowledge of RIDEM fishery biologists, NOAA restoration ecologists, and other persons involved with fish passage restoration contributed important for preparing this RP/EA.

Based on the information available as indicated above, NOAA has identified two preferred restoration alternatives on the Saugatucket River, one non-preferred alternative located in a smaller, nearby South County watershed (Factory Brook) west of the Saugatucket River, and a no-action alternative that would not result in implementation of any fish passage projects, but is provided for a comparison of potential impacts. Other potential restoration projects or actions within the Saugatucket River and other nearby South County watersheds were investigated but found to be infeasible due to property ownership challenges, the action has been completed since the settlement by others or through other programs, or the project or action would not provide in-kind restoration of the natural resources injured. The following is a description of the set of alternatives that NOAA has evaluated for implementation using the Rose Hill Landfill Site settlement funds.

Two existing dams equipped with fishways constructed in the early 1970s are in place downstream of the impacted/Site area that, if modified, could significantly improve upstream and downstream fish passage efficiency for alewife, blueback herring, and American eel. At both of these dams, RIDEM fishery biologists annually document the presence of river herring and American eel at the base of the dams, and low numbers of river herring passing through the fishways. Based on fishery and hydraulic assessments at these two dam barriers, there is

evidence that the existing structural fishways are not functioning properly to efficiently pass river herring or American eel.

The first dam encountered on the Saugatucket River traveling upstream from the head-of-tide is the Main Street dam in Wakefield, RI (Alternative 1, Section 6.2) which is owned by the Town of South Kingstown. The existing Denil fishway associated with this dam is owned and maintained by the RIDEM, and RIDEM holds an easement with the Town to access and maintain the fishway. The Town supports the fish passage improvements and will allow access for the fishway modifications to occur. Methods to improve fish passage at the Main Street dam are presented and discussed in detail in Section 6.2.

Approximately 1-river mile upstream is the privately-owned Palisades Manufacturing Company Dam (Alternative 2, Section 6.3). The owner of this private property is in support of fish passage and the improvements at this facility. Recently, a modification of the concrete flume structure was completed through the Restore America's Estuaries Program which is based on a collaborative partnership between NOAA and Save the Bay, a non-governmental organization, to address restoration opportunities associated with Narragansett Bay and other Rhode Island coastal waters. The modification involved the placement of prefabricated metal angle irons bolted into the flume to increase survivorship of out-migrating juvenile river herring passing over the spillway flume. This completed action has proven effective in deflecting flows to the central plunge pool below the spillway. Conversely, upstream passage by river herring at the Palisades facility remains substantially inefficient, and modifications to the current fishway would significantly improve diadromous fish passage at this dam. The proposed project will also allow eel passage to occur at this dam barrier by installation of an eelway. Methods to improve fish passage at the Palisades Dam are presented and discussed in detail in Section 6.3.
NOAA has determined that performing both of the proposed restoration projects (Alternatives 1 and 2) would best improve migration of diadromous fish in the Saugatucket River watershed. Implementing the two projects together would maximize the potential for both upstream and downstream diadromous fish passage. NOAA does not anticipate any adverse impacts to the restored runs as a result of these remedial actions. Total costs to improve fish passage at both the Main Street dam and the Palisades dam are estimated at $205,000.

Under the Consent Decree, the RPs provided $117,000 to NOAA for the compensatory restoration, including the initial project and follow-up monitoring that was originally used to develop the consent settlement agreement. Additional funding needed to complete the fishway and dam modifications for the two preferred projects have been secured through federal and state grant programs. Should construction costs for these projects exceed the estimated costs and available funds, supplemental monies are expected to be secured from federal, state or other organizational grant funding opportunities such as NOAA's Community-Based Restoration Program, the United States Fish and Wildlife Service's National Fish Passage Program, and/or the state of Rhode Island's Habitat Restoration Trust Fund administered by Rhode Island's Coastal Resources Management Council. The following sections discuss and evaluate the restoration alternatives considered in greater detail.

6.0 Evaluation of Reasonable Range of Restoration Alternatives

6.1 Non-Preferred Alternative: No Action

NEPA requires NOAA and other federal agencies to evaluate a No Action alternative, and it is also an option that can be selected under CERCLA. With the No Action alternative, NOAA would take no direct action to restore the natural resource injuries or compensate for lost services pending environmental recovery, and so would rely only on natural recovery and resource management conditions to occur. While natural recovery would occur over varying time scales for the various injured riverine resources, the interim losses incurred would not be compensated for under the No Action Alternative. This alternative would cost the least because no direct action would be taken, but such savings must be weighed against the potential for recovering the natural resource loss.

Section IX of the Consent Judgment specifically required the RPs to fund "…the implementation and monitoring of fish passage restoration projects on the Saugatucket River," (in order the resolve their environmental liability for the federal natural resource damage claim. The RPs provided the $117,000 to NOAA per the terms of the Consent Judgment. NOAA's responsibility to utilize natural resource damages settlement funds to restore, replace or acquire the equivalent of injured natural resources clearly set forth in CERCLA.

Restoration of diadromous fish populations in the Saugatucket River cannot be substantially achieved through the No Action Alternative. While the Trustees have determined that natural recovery was appropriate as the primary restoration, the No Action Alternative is rejected for compensatory restoration since substantial interim losses occurred during the period of recovery of the Site contamination. Technically-feasible and cost-effective alternatives exist to compensate for these losses, and have been addressed through feasible and preferred project Alternatives 1 and 2 as discussed in Sections 6.2 and 6.3.

6.2 Preferred Restoration Alternative 1: Improve Fish Passage, Main Street Dam, Wakefield, RI

This alternative involves a project to improve diadromous fish passage in the Saugatucket River to address river herring injuries resulting from the Site releases.

6.2.1 Restoration Site Location and Action Description

The Main Street dam (location relative to the Rose Hill Landfill Site in Figure 1), owned by the Town of South Kingstown, is situated on the Sauguatucket River immediately north of the Main Street bridge in the village of Wakefield, Rhode Island. The ~100-foot long, 6-foot high, 19th century stone structure includes a large number of boulders at the toe of the dam and a Denil fishway on the left bank (as if facing downstream, looking at the dam) that was constructed in the early 1970s for river herring passage (Figure 2). The dam forms a relatively narrow but lengthy, shallow impoundment that is used for recreational boating and fishing, and is also appreciated by the local community for various waterfront activities and celebrations. The pond also provides spawning habitat benefits for alewife. Because of its village setting and substantial

recreation al use and aesthetic value of the impoundment, dam removal is not a feasible option for this potential fish passage site.

The existing RIDEM-owned Denil fishway on the river left bank is operational but has been determined to need improvements for increasing fish passage efficiency. Passage problems associated with this fishway include: a poorly located entranceway and excessive flows through the fishway during the normal operational period that limit upstream passage by adult river herring; flows across the dam spillway that cause mortality of out-migrating juvenile herring that are carried over the dam spillway and land on, or are trapped in, the boulder apron at the toe of the dam; and the lack of effective passage by American eel.

To improve diadromous fish passage at the Main Street dam, the following work activities are being proposed: (1) remove and reconstruct the lower portion (~50-foot length) of the fishway to relocate the fishway entranceway closer to the base of the dam; (2) install several additional baffles in the upper portion of the existing Denil fishway to reduce excessive flows through the fishway; (3) modify the fishway exitway to lessen trash accumulation and facilitate debris removal; (4) install a notch equipped with flashboard in spillway and modify the downstream boulder layout and plunge pool to improve out-migration by juvenile river herring; (5) assess and construct if needed, potential modification or replacement of the dam drain gate along the right bank for potential juvenile herring out-migration alternative; and (6) install an eelway with the entranceway of the eelway located on the quiescent backside of the Denil fishway entranceway.

To accomplish one or more of these fish passage improvements, this alternative will require that a field survey be completed of the dam, existing fishway, and site conditions in the immediate vicinity of the dam to creat a base map for design. With this survey information, engineering design services will then be completed to evaluate fishway entrance and exitway elevations, and fishway flows favorable for upstream passage by adult river herring. Results of the engineering analysis will be used to prepare a plan for the redesign of the fishway. Permit applications will then be prepared to secure any regulatory authorizations for reconstruction of the fishway, any modification of the dam, and/or installation of an eelway. The funds for the design phase have been secured, and the design and permitting of the project is expected to be completed in 2011. This preferred alternative seeks to cover the costs of the fishway reconstruction which are estimated at $180,000. It is anticipated that the construction would occur in summer of 2012. The project, if constructed, would be expected to increase the annual run size of river herring in the lower Saugatucket River to low to mid-level 10,000s of returning adult herring, based on the expected available spawning and rearing habitat.

Figure 1. Location of the Main Street dam and fishway, situated 5 km (3 mi) south of the Rose Hill Landfill Site; and the Palisades dam and fishway situated 3.5 km (2 mi) south of the Rose Hill Landfill Site. The Main Street dam and fishway is located 1 km (0.6 mi) north of Pt. Judith Salt Pond and just above the head-of-tide.

Figure 2. Main Street dam and fishway, 2011, Wakefield, RI.

6.3 Preferred Restoration Alternative 2: Improve Fish Passage, Palisades Manufacturing Company Dam, Peace Dale, RI

This alternative involves a project to improve diadromous fish passage in the Saugatucket River to address river herring injuries resulting from the Site releases.

6.3.1 Restoration Site Location and Action Description

An existing Denil fishway is located on the Saugatucket River within a private commercial building property ("Palisades" commercial building) approximately 1 mile upstream of the Main Street dam (Figure 1). The Palisades site includes a dam, flume, and the Denil fishway constructed in the 1970s for river herring passage that rises approximately 13 feet and includes turn/resting pools and a series of wooden baffles (Figure 3). Normal river flows pass through both the flume and the fishway. The ~5-foot wide concrete and stone flume and fishway carry flows to a diversion of the Saugatucket River that passes under the Palisades building. The flows through the flume and Denil fishway carry most of the normal Saugatucket River flow.

Fish passage engineers have determined that passage deficiencies exist at the Palisades fishway including excessive flows and velocities through the normal operational period of the fishway;

the need for effective eel passage; and possible modification of the plunge pool at the base of the flume plunge for out-migrating fish.

To improve diadromous fish passage at the Palisades facility, the following work activities are being considered: (1) extending the central concrete wall separating the flume and fishway flows to modify the fishway channel by reducing excessive fishway flows; (2) install several baffles in the extended fishway created by the wall extension; (3) install eelway; and (4) possibly modify the flume plunge pool to lessen potential mortality of out-migrating juvenile river herring.

To implement these minor fish passage improvements, this alternative requires field survey and engineering services including flow and velocity calculations and analysis, plan design preparation, and regulatory permitting for modification of the fishway and/or flume and/or installation of an eelway. Funds for completing this work have already been secured from another natural resources damage settlement, and the design and permitting of the project are expected to be completed in 2011. The projected costs for construction of the Palisades dam flume and fishway improvements are $25,000. It is anticipated that the construction would occur in summer of 2012. The project if constructed in combination with the Main Street fishway, would be expected to increase the annual run of river herring in the Saugatucket River to mid to upper-level 10,000s of returning adult herring, based on the expected available spawning and rearing habitat.

Figure 3. Palisades dam and fishway, Peace Dale, RI

Figure 4. Palisades flume (left), fishway (right), and proposed work site of the central wall extension, looking from upstream of the structures, 2011, Saugatucket River, Peace Dale, RI

6.4 Non-Preferred Restoration Alternative 3: Teal Drive Culvert Replacement, South Kingstown, RI

This alternative involves a project to improve diadromous fish passage in a watershed other than the Saugatucket River. Thus, this is a non-preferred alternative due to the out-of-watershed location of the project, but if implemented, the project would contribute to improving diadromous fish populations in Block Island Sound, and indirectly addresses NOAA trust resource injuries resulting from the Site releases.

6.4.1 Restoration Site Location and Action Description

Factory Brook is a perennial stream that discharges to Green Hill Pond, a coastal salt pond, located approximately 9.5 miles southwest of the Rose Hill Site (Figure 5). Factory Brook flows from Factory Pond, a 35-acre waterbody that serves as a public water supply source to the Town of South Kingstown. From Factory Pond, the brook extends for 1.2 miles before discharging to Green Hill Pond. Immediately upstream of Green Hill Pond, Factory Brook is crossed by Teal Drive, a local, town-owned, 12-foot wide gravel road that provides access to a small residential community. The Teal Drive crossing consists of two 24-inch diameter corrugated metal pipes, each with distinct invert elevations both upstream and downstream of the road crossing. Downstream of the road crossing, the invert of the left side culvert is 5 inches higher than the

invert of the right side culvert (Refer to Figure 6). Conversely, on the upstream side of the road crossing, the invert elevations of the two culverts are reversed with the lower set culvert being the left side culvert. Thus, during low flow periods, most of the stream flows pass through the left side culvert and would discharge with the perched culvert condition on the downstream side of the road.

The Teal Drive culverts act as a diadromous fish passage impediment during low flow periods when alewife and American eel may be attempting to pass upstream to spawning and rearing habitat. To address potential fish passage concerns, the culverts would be replaced with a single concrete box or open bottom concrete arch culvert to allow for unimpeded fish passage through a broad range of stream flows. Work would involve removal of the existing corrugated metal culverts, installation of the new concrete culvert, and restoration of the local access road.

This alternative would require up-front field survey and mapping, engineering design and permitting in addition to the implementation of the project. Costs of the up-front assessment, design and permitting services are estimated at $60,000. The cost of the culvert replacement and construction oversight services is estimated at $110,000. Thus, the Rose Hill settlement funds could be used to fund one of the project phases. Additional funds from other sources, similar to those identified for the Saugatucket River alternatives, would need to be secured to complete all phases of the project. Optimally, the up-front design and permitting and project implementation could occur in 2012, if adequate funds were secured to supplement the Rose Hill funds, if they were used for this project. The project, if constructed, would be expected to increase the annual run of river herring in Factory Brook to low to mid-level 10,000s of returning adult herring, based on the expected available upstream spawning and rearing habitat.

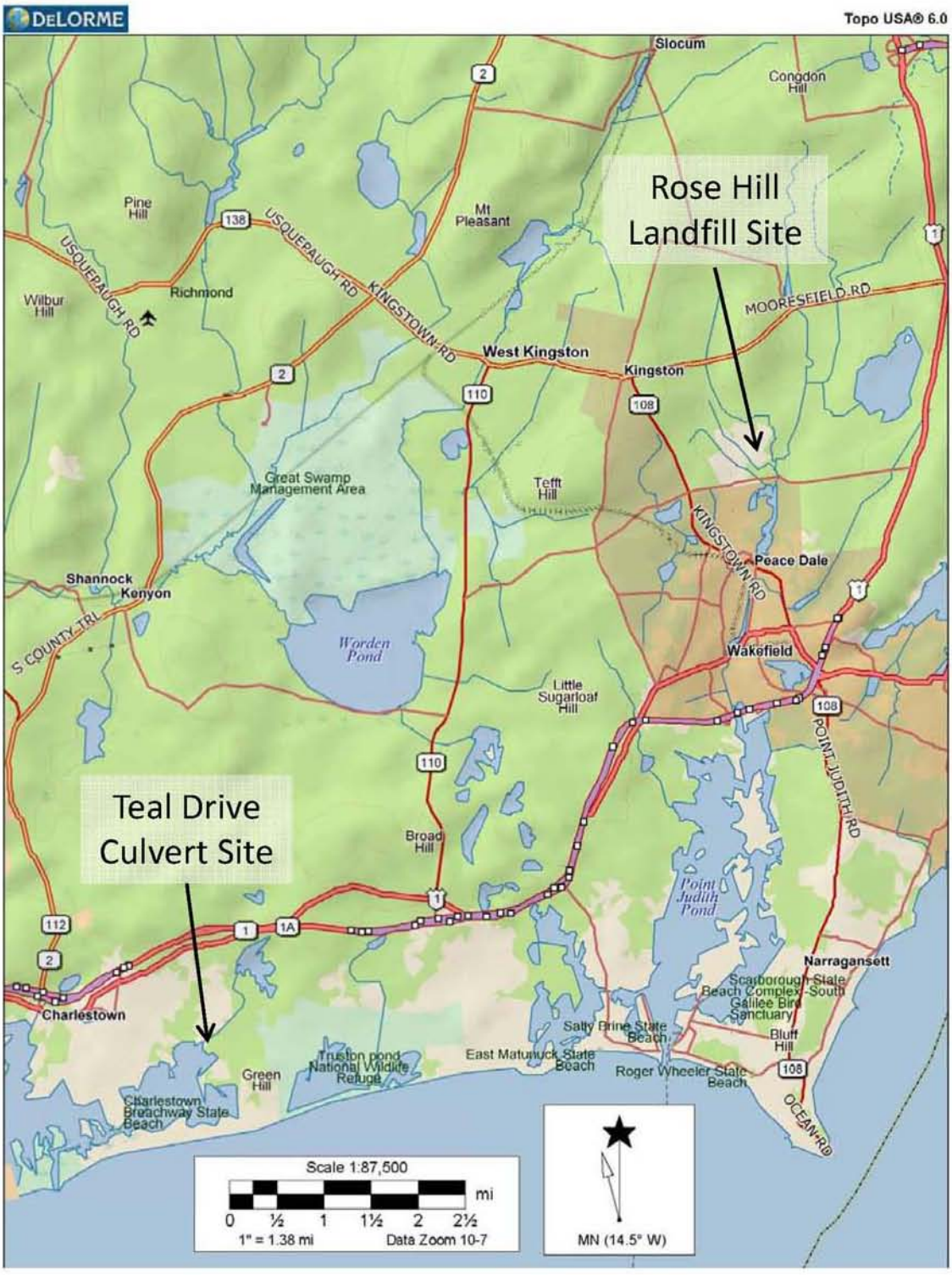

Figure 5. Location of Factory Brook and Teal Drive culverts relative to the Rose Hill Landfill Site, South Kingstown, RI.

Figure 6. Teal Drive culverts, Factory Brook, South Kingstown, RI, 2011. The culvert perched on the right is higher than the culvert on the left and both culverts provide poor fish passage with varying stream flows.

6.5 Environmental Consequences

NOAA is proposing the implementation of Alternatives 1 (Main Street dam and fishway improvements) and 2 (Palisades dam and fishway improvements). The proposed restoration projects are very similar in scope, size, setting within an existing man-made feature, and watershed and geographic location. Since the anticipated environmental consequences of these two projects would be similar, the evaluation of anticipated impacts associated with implementation of each of these projects is individually described for both projects in the following analysis.

As part of this RP/EA document, federal agencies preparing an EA must consider the direct effects of all components of a proposed action as well as indirect and cumulative effects. The following are explanations of each impact type and concise responses for each of these potential environmental consequences if one or more of the project and work activities are implemented.

Direct Effects: According to the CEQ NEPA Regulations, direct effects are caused by the action and occur at the same time and place as the action (40 C.F.R. 1508.8(a)). Either fish passage improvement project will have negligible direct impact on the environment.

For the Palisades dam and fishway improvements, all work would occur within an existing concrete flume through which the river flows. For construction flows through the flume would be diverted to another existing channel around the Palisades Manufacturing Company facility. Thus, no direct impacts to wetlands or other water resources would result from this project.

For the Main Street dam and fishway improvements, minor changes to the river channel in the vicinity of the fishway would occur. Approximately 1,000 square feet of riverbed and bank would be affected by the placement of the new section of the concrete fishway. A portion of this minor impact would be offset by the removal of the existing lower fishway with restoration of this floodplain area. No loss of floodway or 100-year floodplain would result from this project, and no federally-regulated vegetated wetlands would be affected.

Indirect Effects: According to the CEQ NEPA Regulations, indirect effects are caused by the action but "occur later in time or are farther removed in distance but are still reasonably foreseeable". Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate (40 C.F.R. 1508.8(b)).

Cumulative Effects: According to the CEQ NEPA Regulations, cumulative effects are those effects that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes such actions. NOAA considered cumulative effects of the implementation of one or both of the preferred alternatives and concludes that negligible impacts, including adverse cumulative effects, would result from project implementation.

In addition to the above impact evaluations, NOAA also evaluated the potential for the proposed restoration action to impact the natural environment, the built environment, and public health and safety. The following are summaries of the potential environmental and public health and safety issues considered for the proposed projects.

Water Quantity and Quality: During the construction period, concrete structural removal and placement and earth and boulder moving activities may cause short-term, minor turbidity to river flow in the immediate vicinity of the Main Street Dam, although the proposed work would be completed during the low-flow period (July 1-September 30) and procedural actions during construction will minimize any potential turbidity effects. Dewatering activities would be employed, and any effluents released by work site dewatering practices would be minimized using sediment and erosion control best management practices (e.g., sediment bags or haybale trap). After construction is completed, the sites are expected to be stabilized through vegetative seeding and/or plantings where disturbed lands and final graded soils are placed around the rebuilt Main Street fishway, and therefore, negligible release of sediments to the river is expected.

Additionally, the proposed fishway modification work would require minor, temporary diversion of flows from the fishway(s) and portions of the dam structure(s). The use of large sandbags or other water diversion practices would be employed to minimize flows through the construction work area. This may result in localized river habitat areas that receive less flow, thereby

potentially resulting in minor, short-term changes in water quantity and/or quality. Mobile biota would be expected to move from the construction area. The proposed work at each site is expected to take no longer than two to six weeks, and thus, once the projects are completed, the river flow and channel habitat are expected to return normal conditions.

Water Resources: During the construction phase of this project, minor short-term and localized impacts will occur. As a result of earth-moving activities, there will be localized increases in turbidity and sedimentation near the project area. These conditions may affect fish and stream macro-invertebrates in the immediate downstream area. Fish and mobile invertebrates are less likely to be affected, since these animals would most likely move from the disturbance area, and repopulate an area following project completion and site restoration. Increased noise levels (e.g., jack-hammering) due to the operation of earth-moving equipment may also cause fish to leave the area until construction activities (the source of the noise) cease.

Air Quality: Minor temporary impacts would result from the proposed construction activities. Exhaust emissions from earth-moving equipment contain air pollutants, but these emissions would only occur during the short-term construction phase of the project, the amounts would be small, and should be quickly dissipated by prevailing winds. Removal of concrete materials may also generate localized, short-term dust release, but would occur only during a brief period (1-2 days) when a portion of the Main Street dam fishway is removed. There would be no long-term or cumulative negative impacts to air quality associated with these restoration projects and associated work activities.

Noise: Noise associated with earth-moving equipment represents a short-term impact during the construction phase. The construction noise may temporarily disturb wildlife in the immediate vicinity of the site, or cause movement of wildlife away from the site to other ecologically suitable areas (e.g., waterfowl and muskrat using the upstream pond). Similarly, recreating humans may avoid this area due to noise during construction, but such disruptions would be limited to the construction phase (~one month period or less). No long-term or cumulative effects would occur as a result of construction noise.

Geology: None of the components of the proposed restoration actions includes activities with the potential to directly or indirectly affect, positively or negatively, the geology of the area. Proposed work at the Main Street dam may affect a limited area of boulders and gravel at the toe of the dam that were previously placed in this area for channel bed stability below the dam. The Main Street fishway reconstruction would also result in a small excavation area to construct the new section of the fishway, although this minor disturbance is expected to be offset for the restoration of the area where the existing lower fishway section will be removed.

Recreation: The noise and construction work activities resulting from earth-moving during project construction are expected to discourage and decrease recreational activities in the immediate vicinity of the site (e.g., canoeing on the pond; stroll along the riverwalk in the vicinity of the Main Street dam fishway). Any such effects will be limited to the period of construction and should be minor. Over the longer term, the proposed restoration action will increase the quality, productivity and quantity of fish passage in this area. Annual springtime

herring runs are an attractive draw to residents and visitors of the area, and the improvement in site conditions will enhance opportunities for, and quality of, a variety of recreational uses.

Traffic: Minor changes in traffic flow or patterns will occur or increase at the Main Street site during the period of construction. The area and constituents most affected by the traffic. Because of the commercial use of this area, increased traffic associated from the restoration efforts will likely go un-noticed. Local traffic police is expected to assist in the project during construction to minimize adverse traffic flows in the Main Street and Palisades areas.

Aesthetic Impacts: The proposed restoration project sites are existing dam and fishway structures situated at dams that were constructed more than 50 years ago, but which have been substantially modified more recently. The changes to the dams will result in minor visual aesthetics at each of the sites. Greater view is afforded to the public at the Main Street dam site, with minor changes in the layout of the fishway downstream of the dam. These changes will be visible to the public from the Main Street bridge, although the rebuilt fishway will largely be installed near the ground surface and will not cause a hindrance to the viewscape of the dam and fishway.

Historic Impacts: Since the dams are greater than 50 years in age, they are potential historic features to the Villages of Wakefield and Peace Dale. The proposed work will need to be submitted to the Rhode Island Historic Preservation Commission (RIHPC) for review and comment in accordance with Section 106 of the National Historic Preservation Act. Any potential adverse effects to historic features would be minimized or mitigated by seeking input from the RIHPC. Mitigation measures, if needed, will be described in a Memorandum of Agreement between NOAA and the RIHPC to minimize or offset any potential adverse effects. Since the project sites have been previously altered by the installation of the existing fishways, it is unlikely that concerns will be raised on the proposed modifications to the dam sites and fishways for the purposes of improved fish passage.

Precedential Effects of Implementing the Project: Fish passage restoration projects are regularly implemented along the Atlantic East Coast to address fish passage barriers present in many of the region's watersheds, and have been used as a means of compensating the public for other natural resource damage claims addressed in New England. The proposed project does not in and of itself represent or create a precedent for future settings of a project type that would significantly affect the quality of the human environment.

Cumulative Impacts: The proposed projects are not expected to have a significant cumulative effect on the human environment since the projects alone, or in combination with other fish passage projects in the vicinity, would not change the pattern of hydrologic discharge, boat traffic, economic activity or land-use in the Saugatucket watershed. Project effects will be cumulative in the sense that the re-established and enhanced or restored upstream and downstream fish passage/s at the site(s) will provide important beneficial ecological services in the future. The actions proposed are intended to make the public and the environment whole, for resources injuries caused by releases of hazardous substances into the Saugatucket River watershed from the Site. The proposed restoration actions would contribute to a comprehensive plan for the restoration of diadromous fish species in Rhode Island and Southern New England

coastal waters. By contributing to this comprehensive restoration strategy, these restoration projects would help to increase the populations of river herring and American eel in this region. Such results would help to increase a fishery forage base and contribute to recreational and commercial fisheries in Southern New England.

7.0 Laws and Regulations

Anadromous Fish Conservation Act – The Anadromous Fish Conservation Act (16 USC 757a *et seq*.) provides authority to conserve and enhance anadromous fishery resources. The preferred alternative(s) will directly conserve and enhance anadromous fishery resources.

Archeological Resources and Historical Preservation – Numerous acts afford protection to antiquities, abandoned shipwrecks, archeological resources, historic buildings and historic sites. These include the Abandoned Shipwreck Act of 1987 (43 USC 2102 *et seq*.), the Archeological Resources Protection Act of 1979 (16 USC 470, *et seq*.), the Historic Sites Act of 1935 (16 USC 461-467), the Historical and Archeological Data Preservation Act (16 USC 469-469c), and the National Historic Preservation Act (NHPA) of 1966 as amended (16 USC 470-470t, 110). Any proposed action that may potentially affect any property with historic, architectural, archeological, or cultural value that is listed on or eligible for listing on the National Register of Historic Places (NRHP) must comply with the procedures for consultation and comment issued by the Advisory Council on Historic Preservation, usually through consultation with the state historic preservation officer.

NOAA will coordinate with the Rhode Island Historical Preservation and Heritage Commission (RI HPHC) to identify any properties that may be affected by the preferred restoration alternative (s) that are listed or eligible for listing on the NRHP (e.g., Main Street Dam or Palisades Manufacturing Company). Should either property be listed or eligible for the NRHP, NOAA will coordinate with the RI HPHC, Town of South Kingstown, the Palisades Manufacturing Company, and potential Consulting Parties, as defined by the NHPA, to avoid, minimize, or mitigate any potential impacts to cultural resources or features at the Main Street and Palisades dam sites, in compliance with Section 106 of the National Historic Preservation Act, as amended.

Clean Air Act – The Clean Air Act (42 USC 7401 *et seq*.) directs USEPA to set limits on air emissions to ensure basic protection of health and the environment. Any construction activities that will be required to implement the selected alternative(s) will be done with conventional construction equipment in compliance with all local ordinances and any applicable state air regulations. Any release of short-term emissions from construction equipment is expected to be of very short-term, localized, and limited in magnitude relative to the surrounding urbanized settings in which the proposed restoration sites are located. No significant air impacts are expected with any of the projects considered in the RP/EA.

Clean Water Act – The Clean Water Act (33 USC 1251, *et seq*.) is the principal law governing pollution control and water quality of the nation's waterways. The USACE administers the program. All construction activity to implement the preferred alternative (s) will be done in

compliance with Section 404 of the law, which authorizes permits for the disposal of dredged or fill material into navigable waters, if necessary. The preferred project alternatives are each expected to result in less than 5,000 square feet of disturbance, and therefore are expected to qualify for a Category I authorization under the USACE Programmatic General Permit (PGP) for Rhode Island. Should a Category II resource agency-screening be required, all criteria under the USACE screening requirements will be addressed and any mitigating conditions will be met.

Coastal Zone Management Act – The goal of the federal Coastal Zone Management Act (CZMA) (16 USC 1451, *et seq*., 15 CFR Part 923) is to preserve, protect, develop and, where possible, restore and enhance the nation's coastal resources. The federal government provides grants to states with federally approved coastal management programs. The State of Rhode Island has a federally approved program. Section 1456 of the CZMA requires any federal action inside or outside of the coastal zone that affects any land or water use or natural resources of the coastal zone to be consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs. It states that no federal license or permit may be granted without giving the State the opportunity to concur that the project is consistent with the State's coastal policies. The regulations outline the consistency procedures.

Regulatory authorization for the two preferred restoration projects will be needed from the Rhode Island Coastal Resources Management Council (CRMC). A CRMC approval (a minor category "Assent") will be required and obtained for the proposed projects; and general concurrence from the State of Rhode Island will be secured that the preferred restoration alternative(s) are consistent, to the maximum extent practicable, with the enforceable policies of the State's coastal program.

Endangered Species Act – The federal Endangered Species Act (16 USC 1531, *et seq*., 50 CFR Parts 17, 222, 224) directs all federal agencies to conserve endangered and threatened species and their habitats and encourages such agencies to utilize their authority to further these purposes. Under the Act, both the National Marine Fisheries Service (NMFS) and USFWS publish lists of endangered and threatened species. Section 7 of the Act requires that federal agencies consult with these two agencies to minimize the effects of federal actions on endangered and threatened species.

Except for occasional transient individuals, no federally listed or proposed endangered or threatened species are known to exist in the restoration project areas. In addition, no habitat in the project impact areas is currently designated or proposed as "critical habitat" in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended; 16 USC 1531 *et seq*.). Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act is required. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination will be re-evaluated.

Estuary Protection Act – The Estuary Protection Act (16 USC 1221-1226) highlights the values of estuaries and the need to conserve natural resources. It authorizes the Secretary of the Interior, in cooperation with other federal agencies and the states, to study and inventory estuaries of the US, to determine whether such areas should be acquired by the Federal Government for protection, to assess impacts of commercial and industrial developments on

estuaries, to enter into cost-sharing agreements with states and subdivisions for permanent management of estuarine areas in their possession, and to encourage state and local governments to consider the importance of estuaries in their planning activities related to federal natural resource grants. The preferred alternative (s) are not expected to have any adverse affects on any estuary and is expected to result in long-term or permanent beneficial impact to the estuarine resources by enhancing diadromous fish populations in the Pt. Judith salt pond and nearby coastal waters.

Fish and Wildlife Conservation Act – The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 and 50 CFR 83) provides for the consideration of impacts on wetlands, protected habitats and fisheries. The restoration project will enhance fish passage and survivorship, thereby benefiting fishery resources including river herring, American eel and other species that use these species as prey items.

Fish and Wildlife Coordination Act – The Fish and Wildlife Coordination Act (16 USC 661, *et seq*.) states that wildlife conservation shall receive equal consideration with other features of water-resource development. The Act requires federal permitting and licensing agencies to consult with NMFS, USFWS, and state wildlife agencies before permitting any activity that in any way modifies any body of water to minimize the adverse impacts of such actions on fish and wildlife resources and habitat.

NOAA has worked cooperatively with the USFWS and RIDEM Division of Fish and Wildlife to evaluate various restoration projects and in identifying the preferred alternatives. The preferred alternatives are not expected to have any long-term adverse affects on fish and wildlife resources or their habitats, and are expected to result in long-term or permanent beneficial impacts to fish and wildlife resources by enhancing diadromous fish populations in the Saugatucket River, Pt. Judith Salt Pond, and other nearby coastal waters. Additional coordination with the NMFS will be completed prior to any federal permitting or licensing activities to ensure all regulatory issues have been addressed and resolved.

Magnuson-Stevens Fishery Conservation and Management Act – The Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801, *et seq*.) as amended and reauthorized by the Sustainable Fisheries Act (Public Law 104-297), established a program to promote the protection of essential fish habitat (EFH) in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. After EFH has been described and identified in fishery management plans (FMPs) by regional Fishery Management Councils, federal agencies are obligated to consult with the Secretary of the U.S. Department of Commerce with respect to any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH.

EFH descriptions provided by the New England Fishery Management Council do not include detailed descriptions of riverine or riparian systems and their distribution within each of the management areas. Potential impacts to managed species would be limited to species within estuarine habitats and along stream channels such as marsh edges, SAV, and pools and riffles. The preferred restoration alternative (s) is not expected to have any long-term adverse affects on

EFH of managed species, and is expected to result in long-term or permanent beneficial impacts to EFH by enhancing diadromous fish populations including river herring and American eel that serve as forage items for managed species such as summer flounder and haddock. Additional coordination with the NMFS regulatory/advisory staff will be completed prior to any federal permitting activities

Marine Mammal Protection Act - The Marine Mammal Protection Act (16 USC 1361, *et seq*.) establishes a moratorium on the taking and importation of marine mammals and marine mammal products, with exceptions for scientific research, allowable incidental taking, subsistence activities by Alaskan natives, and hardship. The Act provides authority to manage and protect marine mammals, including maintenance of the ecosystem. The preferred restoration alternatives would be implemented in a riverine environment with no likelihood of interaction with marine mammals in the area of the proposed restoration. Marine mammals would indirectly benefit from the projects since river herring are forage items for seals and other marine mammals using Rhode Island coastal waters and open ocean habitats.

Migratory Bird Treaty Act –The Migratory Bird Treaty Act (16 USC 715, *et seq*.) provides for the protection of migratory birds. The Act does not specifically protect the habitat of these birds but may be used to consider time-of-year restrictions for contaminant remedial or restoration activities on sites where it is likely migratory birds may be nesting and/or to stipulate maintenance schedules that would avoid the nesting seasons of migratory birds. The proposed restoration sites are located within relatively urbanized sites where migratory bird nesting does not occur.

National Environmental Policy Act – Congress enacted the National Environmental Policy Act (NEPA; 42 USC 4321 *et seq*.) in 1969 to establish a national policy for the protection of the environment. NEPA applies to federal agency actions that affect the human environment. Federal agencies are obligated to comply with NEPA regulations adopted by the Council on Environmental Quality (CEQ). NEPA requires that an Environmental Assessment (EA) be prepared in order to determine whether the proposed restoration actions will have a significant effect on the quality of the human environment. If an impact is considered significant, then an Environmental Impact Statement (EIS) will be prepared. If the impact is considered to not be significant, then a Finding of No Significant Impact (FONSI) must be issued.

In compliance with NEPA and its regulations, NOAA has integrated this Restoration Plan (RP) and Environmental Assessment (EA) to summarize current environmental conditions, describe the purpose and need for a restoration action, identify alternative restoration activities, assess their applicability and environmental consequences, and summarize opportunities for public participation on the decision-making process. This RP/EA process includes release of the draft RP/EA for public review and comment. Any comments received during the public comment period will be fully considered in developing the final RP/EA and selected restoration project(s).

Rivers and Harbors Act – The Rivers and Harbors Act (RHA; 33 USC 401, *et seq.*) regulates development and use of the nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters and vests the USACE with authority to regulate discharges of fill and other materials into such waters. Restoration actions that

require Section 404 Clean Water Act permits are likely also to require permits under Section 10 of the RHA. However, a single permit usually serves for both. NOAA expects compliance with the RHA through the same mechanism. The restoration alternatives addressed in the RP/EA are expected to be authorized through a USACE nationwide permit.

Executive Order 11514 Protection and Enhancement of Environmental Quality, as amended by Executive Order 11911 Relating to Protection and Enhancement of Environmental Quality – Executive Orders 11514 and 11991 require that federal agencies monitor, evaluate and control their activities to protect and enhance the quality of the Nation's environment to sustain and enrich human life; inform the public about these activities; share data gathered on existing or potential environmental problems or control methods; and cooperate with other governmental agencies. The preferred alternatives(s) fully address the intent of Executive Order 11514.

Executive Order 11988 Floodplain Management – Executive Order 11988 is a flood-hazard policy requiring federal agencies to take action to reduce the risks of flood losses; to restore and preserve the natural and beneficial values served by floodplains; and to minimize flood impacts on human safety, health, and welfare. Floodplain impacts have been considered prior to the selection of the identified restoration activities, and their implementation is not expected to have any adverse impacts to floodplains.

Executive Order 11990 Protection of Wetlands – Executive Order 11990 (40 CFR 6392 (a) and Appendix A) requires federal agencies to avoid the adverse impacts associated with the destruction or loss of wetlands, to avoid new construction in wetlands if alternatives exist, and to develop mitigation measures if adverse impacts are unavoidable. Implementation of the preferred alternative(s) will not result in the loss or alteration of wetlands, and no new construction within a wetland is associated with the preferred alternatives. Any impacts to wetlands during construction activities will be minimized using best construction practices; long-term habitat enhancements are associated with project implementation as the restoration of diadromous fish populations is expected to provide water quality benefits to the surface waters of the Saugatucket River.

Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 12948 Amendment to Executive Order No. 12898 – Executive Orders 12898 and 12948 require each federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations. NOAA has concluded that no low income or ethnic minority communities would be adversely affected by implementing any of the proposed restoration activities.

Executive Order 12962 Recreational Fisheries – Executive Order 12962 requires that federal agencies, to the extent permitted by law and where practicable, and in cooperation with states and tribes, improve the quantity, function, sustainable productivity, and distribution of the Nation’s aquatic resources for increased recreational fishing opportunities. The preferred restoration activities will enhance diadromous fish populations, and would contribute to improving recreational fisheries.

8.0 Literature Cited

Buchman, M., R.M. Kocan, and B.A. Bergquist. 1994. Final report: An evaluation of Saugatucket Pond sediment, South Kingstown, RI.

Erkan, D. 2002. Strategic plan for the restoration of anadromous fishes to Rhode Island coastal streams. RIDEM report in fulfillment of federal aid in sportfish restoration project F-55-R. December 2002. 82 pp.

Metcalf & Eddy (for USEPA). 1994. Remedial investigation final report. Volumes I-V.

National Oceanic and Atmospheric Administration (NOAA). 1994. Preliminary natural resource survey. Hazardous Materials Response and Assessment Division, NOAA, Seattle, WA.

U.S. District Court. District of Rhode Island.2002. Rose Hill Regional Landfill Superfund Site, South Kingstown, Rhode Island. Consent Decree under CERCLA Sections 106 and 107.

U.S. Environmental Protection Agency (USEPA). 1999. Record of decision. Rose Hill Regional Landfill, Superfund Site, South Kingstown, RI. EPA ID# RID980521025.

9.0 Persons and Agencies Consulted

Caitlin Chaffee – Coastal Policy Analyst, Rhode Island Coastal Resources Management Council, Stedman Government Center, 4808 Tower Hill Road, Wakefield, RI 02879

Philip Edwards – Fishery Biologist, Rhode Island Department of Environmental Management, Great Swamp Unit, Kingston, RI

Wenley Ferguson – Restoration Coordinator, Save The Bay, 100 Save the Bay Drive, Providence, RI 02905

Gary Guarriello – Former owner, Palisades Manufacturing Company and Hazard building facility, Peace Dale, RI 02879

Alex Haro – Research Ecologist, S. O. Conte Anadromous Fish Research Laboratory, U. S. Geological Survey, Biological Resources Discipline, 1 Migratory Way, P.O. Box 796, Turners Falls, MA 01376

Dick Quinn – Administrative Manager and Fish Passage Engineer, U.S. Fish and Wildlife Service, Attleboro Office, Attleboro, MA

Dave Reis – Senior Biologist, Rhode Island Coastal Resources Management Council, Stedman Government Center, 4808 Tower Hill Road, Wakefield, RI 02879

John Richard – District Conservationist, USDA-Natural Resources Conservation Service

60 Quaker Lane, Suite 46, Warwick, RI 02886

Jon Schock – Director of Public Services, Public Services Department, Town of South Kingstown, 509 Commodore Perry Highway, Wakefield RI 02879

Eric Thornberg – Owner, Palisades facility, Peacedale, RI, April 2011

Village at Indian Lake Homeowners' and Condominium Owners' Association – 191 Table Rock Road, South Kingstown, RI 02879

Martin Wencek – Wetlands Supervisor, RIDEM, Division of Water Resources, Wetlands Section, Providence, RI 02908

10.0 List of Preparers

James Turek – Assistant Northeast Team Leader, NOAA Restoration Center, 28 Tarzwell Drive, Narragansett, RI 02882

Bryan DeAngelis – Habitat Restoration Specialist, NOAA Restoration Center, 28 Tarzwell Drive, Narragansett, RI 02882

Kate Clark – Regional Resource Coordinator, NOS, Office of Response and Restoration, Assessment and Restoration Division, Northeast Branch, 28 Tarzwell Drive, Narragansett, RI 02882