Draft Environmental Assessment for Implementation of Revisions to the RNA Governing Maritime Transport of Petroleum Products and Other Hazardous Materials on Buzzards Bay, Massachusetts

July 18, 2012

Submitted to:

United States Coast Guard

First Coast Guard District, Waterways Management Branch
And
USCG Civil Engineering Unit, Providence

Prepared by:

EXECUTIVE SUMMARY

This Draft Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 United States Code (USC) §§4321 et. seq.); Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations (CFR) §§1500-1508) and associated CEQ guidelines; Department of Homeland Security Management Directive 5100.1, Environmental Planning Program; and United States Coast Guard (USCG) Commandant Instruction (COMDTINST) M16475.1D, National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts.

ES-1 Purpose and Need

In 1985 the U.S. Congress designated Buzzards Bay as an "Estuary of National Significance;" it is also a component of the Massachusetts-designated "Cape and Islands Ocean Sanctuary" and contains some of Massachusetts' most productive shellfish beds. In 2010, approximately 7,000 commercial vessel transits occurred in Buzzards Bay; of which 495 were vessels (38 single hulls) laden with 5,000 or more barrels of petroleum or other hazardous material. Since 1969 there have been five incidents of tank barge groundings with oil spills in Buzzards Bay that have had an adverse impact on people, property, the coast and maritime environment, and the local economy.

Subsequent to an oil spill from the tank barge North Cape off of Point Judith, Rhode Island in 1996, the USCG implemented a Regulated Navigation Area (RNA) that imposed certain requirements on single hull tank barges transiting New England waters, including Buzzards Bay (33 Code of Federal Regulations [CFR] 165.100).

Following another oil spill on Buzzards Bay in 2003, the Commonwealth of Massachusetts passed the Massachusetts Oil Spill Prevention and Response Act (MOSPA), which was last amended in 2004. The intent of MOSPA was to strengthen several statutes that govern the Commonwealth's ability to prevent and respond to oil spills on its coastal waters. The United States filed suit against Massachusetts in 2005 alleging that certain provisions of MOSPA are preempted by federal law.

In 2007 the USCG published a Final Rule (2007 Final Rule) to implement amendments to the existing Regulated Navigation Area (RNA) applicable to First Coast Guard District waters. The purpose and need for this action was to further reduce the probability of an incident that could result in the discharge or release of oil or hazardous material, or cause serious harm, to navigable waters of the United States. The 2007 amendments were consistent with the mandates of the Ports and Waterways Safety Act which declared that "increased supervision of vessel and port operations is necessary in order to...reduce the possibility of vessel or cargo loss, or damage to life, property, or the marine environment; and to ensure that vessels operating in the navigable waters of the United States shall comply with all applicable standards and requirements for vessel construction, equipment, manning and operational procedures." As part of the process to implement the 2007 federal amendments Final Rule, the USCG prepared a Categorical Exclusion Determination as defined in its Agency Procedures for Implementing the National Environmental Policy Act.

In a ruling on May 17, 2011, the 1st U.S. Circuit Court of Appeals determined that the USCG "failed to comply with its obligations under the National Environmental Policy Act" when it failed to prepare an Environmental Impact Statement (EIS) or an Environmental Assessment (EA). The court did not address the preemption issue.

In response to the Court determination, this Environmental Assessment provides a complete and objective analysis of the impacts of the Buzzards Bay 2007 RNA amendments and alternatives in greater depth and detail than was conducted in the previously prepared Categorical Exclusion Determination.

This document compares the reasonable alternative amendment scenarios (Alternatives 2 through 5) against the baseline of the RNA that was in effect prior to 2007 (The "No Action" Alternative 1) and identifies the preferred alternative (Alternative 3a - the amendments published in the 2007 Final Rule) which will produce the greatest reduction in the risk of a release of hazardous cargo to Buzzards Bay through the measured use of operational controls and increased tank vessel structural integrity.

ES-2 Alternatives Considered in this EA

Five primary alternatives are considered in this EA. Alternative 1 is a no action alternative in which navigation in Buzzards Bay would follow the USCG regulations that were in effect prior to the promulgation of the August 30, 2007 Final Rule amending the Regulated Navigation Area (RNA). Table ES-1 lists the alternatives and their components.

Table ES-1. Alternatives

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				
Alternative 1 (No Action)	• Escort tug required for single hull barges carrying bulk petroleum cargo and being towed by a single–screw tug and for any vessel engaged in towing any tank barge in the event of a casualty that impairs navigation and/or seaworthiness of the barge. • Any tank barge with a capacity of <25,000 barrels operating in limited depth/width or any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug is exempt from the escort tug requirement.	• None	• None	• Every vessel towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.	• Towing vessel owner/operator must prepare a written voyage plan for each transit.	• None

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				
Alternative 2	• Escort tug required for all tank barges carrying **≥6,000** barrels of petroleum if not self-propelled. • Any tank barge with a capacity of >25,000 barrels operating in limited depth/width or any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug is exempt from the escort tug requirement with authorization from the Captain of the Port (COTP).	• State-licensed pilot required if tank barge not accompanied by an escort tug. • The tow barge master is not required to allow the pilot onboard, therefore, pilot may have to direct and control primary tow vessel from aboard the escort tug.	• Towing barges carrying **≥6,000** barrels of oil (no other petroleum products specified) must have onboard one licensed deck officer or barge operator serving as lookout and three licensed officers or tow vessel operators on tow vessel. (Only applicable to barges carrying oil.) • Tank barges must have onboard at all times one certified tanker-man and one other crew member.	• Towing vessels must report to the Vessel Traffic System (VTS) and maintain communication / radio monitoring. • Must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places including Buzzards Bay Entrance Light, Buzzards Bay Mid-channel Light, and Cleveland East Ledge Light.	• Same as Alternative 1. Towing vessel owner/operator must prepare a written voyage plan for each transit.	• Mandatory travel within USCG designated vessel route unless special circumstances require diversion to avoid imminent navigation hazard.

Alternative 3a	• Escort tug required for single hull tank barges carrying **≥5,000** barrels.
	• Same escort tug exemption as Alternative 1.
		• Federal pilot, not a member of the crew, required for all single hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• None	• All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				  • Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner/operator must prepare a written voyage plan for each transit.	• USCG requests but does not mandate use of vessel routes on navigation charts.

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				

Alternative 3b	• Escort tug required for single **and** double hull tank barges carrying **≥5,000** barrels of oil or other hazardous.
	• Same escort tug exemption as Alternative 1.
		• Federal pilot, not a member of the crew, required for single hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• Same as Alternative 2. Towing barges carrying **≥6,000** barrels of oil (no other petroleum products specified) must have onboard one licensed deck officer or barge operator serving as lookout and three licensed officers or tow vessel operators on tow vessel. (Only applicable to barges carrying oil.)
			• Tank barges must have onboard at all times one certified tanker-man and one other crew member.
				• Same as Alternative 3a. All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				• Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner/operator must prepare a written voyage plan for each transit.	• Same as Alternative 3a. USCG requests but does not mandate use of vessel routes on navigation charts.

Alternative 4	• Escort tug required for single **and** double hull tank barges (not tank ships) carrying **≥5,000** barrels of oil or other hazardous substance.
	• Same escort tug exemption as Alternative 1
		• Federal pilot, not a member of the crew, required for single **and** double hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• None.	• Same as Alternative 3a. All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				• Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner/operator must prepare a written voyage plan for each transit.	• Same as Alternative 3a. USCG requests but does not mandate use of vessel routes on navigation charts.

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				

Alternative 5	• Same as Alternative 3a.	• Same as Alternative 3a. Federal pilot, not a member of the crew, required for all single hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• None	• All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges carrying **≥5,000** barrels of oil or other hazardous substance transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				  • Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner/operator must prepare a written voyage plan for each transit.	• Same as Alternative 3a. USCG requests but does not mandate use of vessel routes on navigation charts.

ES-3 Affected Environment and Consequences

Table ES-2 provides a summary of the environmental findings of this EA. A more detailed discussion of the findings of this EA is included at the end of this table. Note that in Table ES-2, "no impact" indicates that there would be no discernible change over pre-2007 RNA conditions.

Table ES-2. Summary of Environmental Findings

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Navigation & Vessel Movement [Benefit to the environment is derived from the reduction in potential for occurrence of a marine incident (grounding, allision, collision) that could result in release of hazardous cargo. This benefit is conditional based upon the type of tank vessel involved.]						
Positive Control	No impact.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial benefit in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.
Manning	No impact.	Substantial benefit from dedicated lookout requirement.	Substantial benefit from requirement for pilot to be on primary towing vessel.	Substantial benefit from dedicated lookout requirement.	Substantial benefit from requirement for pilot to be on primary towing vessel.	Substantial benefit from requirement for pilot to be on primary towing vessel.
Communications	No impact.	Negligible benefit from communications requirement (VTS).	Very substantial benefit from communications requirements (VMRS).	Very substantial benefit from communications requirements (VMRS).	Very substantial benefit from communications requirements (VMRS).	Very substantial benefit from communications requirements (VMRS).
Voyage Planning	No impact.	No impact.	No Impact.	No impact.	No impact.	No impact.
Restricted Navigation	No impact.	Minor benefit.	No impact.	No impact.	No impact.	No impact.

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Biological Resources						
Eelgrass and Salt marsh Habitats	No impact.	Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.
Benthic Communities	No impact.	Minor long-term impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.
Shellfish	No impact.	Minor long-term impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.
EFH	No impact.	Minor long-term impact from increased traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term impact from increased traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term impact from increased traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Protected Species	No impact.	Minor long-term adverse impact from increase in potential hazard of ship strikes with protected species from additional traffic (tug escorts). Potential beneficial long-term impact through dedicated lookouts. Substantial increase in protection from oil spill compared to Alternative 1.	Potential beneficial short-term impact through improved vessel communications. Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact through increase in potential hazard of ship strikes with protected species from additional traffic (tug escorts). Potential long-term benefit impact through improved vessel communications and dedicated lookout. Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact through increase in potential hazard of ship strikes with protected species from additional traffic (tug escorts). Potential beneficial long-term impact through improved vessel communications. Substantial increase in protection from oil spill compared to Alternative 1.	Potential beneficial short-term impact through improved vessel communications. Minor to substantial increase in protection from oil spill compared to Alternative 1.
Socioeconomics						
Population	No impact.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.
Recreation	No impact.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Economy	No impact.	Beneficial impact to municipalities through increased protection from oil spills. Long-term, adverse financial impact to barge owners for tug escort fees. Short-term economic costs to Massachusetts for state-licensed pilots.	Beneficial impact to municipalities through increased protection from oil spills. Short-term, minor adverse financial impact to barge owners for pilot fees. Short-term economic benefits to federal pilots. Substantial benefit through economic incentive for less use of single hull barges in advance of 2015 phase out deadline.	Beneficial impact to municipalities through increased protection from oil spills. Long-term financial impact to barge owners for tug escort and pilot fees. Long-term economic benefits to escort tug owners and federal pilots.	Beneficial impact to municipalities through increased protection from oil spills. Long-term adverse financial impact to barge owners for tug escort and pilot fees. Long-term economic benefits to escort tug owners and federal pilots.	Beneficial impact to municipalities through increased protection from oil spills. Short-term, minor adverse financial impact to barge owners for pilot fees and escort tugs. Short-term economic benefits to federal pilots and escort tug owners.
Employment	No impact.	Potential long-term beneficial impacts if additional pilots are required.	No impact.	Potential long-term beneficial impacts if additional pilots are required.	Potential long-term beneficial impacts if additional pilots are required.	Potential long-term beneficial impacts if additional pilots are required.
Public Health and Safety						
Public Health and safety	No change in impact.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.

The analysis performed for this EA indicates that all of the action alternatives would reduce the probability of an accident occurring in Buzzards Bay that could result in the release of oil. This analysis indicates that Alternative 3a, the 2007 Final Rule, would cause the least adverse environmental impact while providing substantial risk reduction.

- By requiring escort tugs and federal pilots for single-hull barges only, Alternative 3a is expected to provide a financial incentive to barge owners/operators to utilize double hull barges as often as possible leading to greater use of double hull tank vessels sooner than the 2015 deadline when the phase-out of single hull vessels will be complete. By accelerating the reduction in the use of single hull tank barges, the risk of an incident resulting in the release of hazardous materials will be reduced faster than would occur under the other alternatives.

- Alternative 3a includes the most stringent and immediate communication requirements for all tank barges (not just single hull barges) entering and transiting the bay. While the VTS system specified in Alternative 2 would be beneficial, it is not yet available in Buzzards Bay. Because this requirement affects all tank barges, it will remain in place even after single hull barges are phased out of service.

- Because it doesn't require as many additional vessels (escort tugs) as Alternatives 2, 3b and 4, Alternative 3a will have less potential for adverse impact to aquatic animals and plants.

This analysis indicates that an Environmental Impact Statement (EIS) is not necessary for implementation of any of the action alternatives (Alternative 2 through 5). The USCG anticipates that a Finding of No Significant Impact (FONSI) will be appropriate for implementation of Alternative 3a, the 2007 Final Rule. Alternative 3a appears to provide the most time effective means of reducing the occurrence of oil spills on Buzzards Bay and will likely become the USCG's preferred alternative.

ES-4 Agency and Public Consultation

The following entities were consulted in preparation of this DEA. Only the U.S. Fish and Wildlife Service provided a response. Copies of the consultation letters and the response are included in Appendix A.

- National Marine Fisheries Service (NMFS), Gloucester, MA
- U.S. Fish and Wildlife Service (USFWS), Concord, NH
- Massachusetts Historical Commission, Boston, MA
- Massachusetts Natural Heritage and Endangered Species Program (MESP), Westborough, MA

Prior to finalization of the 2007 Final Rule, the USCG contacted the Massachusetts Coastal Zone Program (MCZP), which declined to review the Rule on the basis that it was not listed within the State's program as an activity likely to affect the State's coastal zone. Since this EA is being written with a baseline that predates promulgation of the 2007 Final Rule, the MCZP decision is considered to be still valid for this analysis.

The Commonwealth of Massachusetts, Attorney General's Office was also consulted regarding alternatives to be considered.

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ACRONYMS AND ABBREVIATIONS

APA	Administrative Procedures Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COMDTINST	Commandant Instruction
COTP	Captain of the Port
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ft	Feet
km	Kilometers
m	Meter
MBTA	Migratory Bird Treaty Act
MCZMP	Massachusetts Coastal Zone Management Program
MDEP	Massachusetts Department of Environmental Protection
MDFW	Massachusetts Division of Fisheries and Wildlife
MDMF	Massachusetts Division of Marine Fisheries
MESP	Massachusetts Natural Heritage and Endangered Species Program
MGL	Massachusetts General Law
MOSPA	Massachusetts Oil Spill Prevention Act
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OSPA	Oil Spill Prevention Act
PAWSA	Ports and Waterways Safety Assessment
PL	Public Law
RNA	Regulated Navigation Area
RRAT	Regional Risk Assessment Team

USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGAO	United States General Accounting Office
VMRS	Vessel Movement Reporting System
VTS	Vessel Traffic System

1 PURPOSE AND NEED FOR ACTION

1.1 Introduction

In 1985 the U.S. Congress designated Buzzards Bay as an "Estuary of National Significance"; it is also a component of the Massachusetts-designated "Cape and Islands Ocean Sanctuary" and contains some of Massachusetts' most productive shellfish beds. Buzzards Bay interacts with three different marine systems: the Atlantic Ocean to the south, Vineyard Sound to the east and Cape Cod Bay to the north. In 2010, approximately 7,000 commercial vessel transits occurred in Buzzards Bay, of which 495 were vessels (38 single hulls) laden with 5,000 or more barrels of petroleum or other hazardous material. Since 1969 there have been five incidents of tank barge groundings with oil spills in Buzzards Bay that have had an adverse impact on people, property, the coast and maritime environment, and the local economy. Groundings, allisions, or collisions involving single hull tank barges have the potential to cause substantial adverse impacts by release of hazardous materials cargo to the ecosystem of the bay and its coast as well as to people and property.

Following the oil spill from the tank barge North Cape off of Point Judith, Rhode Island in 1996, the USCG chartered a Regional Risk Assessment Team (RRAT) comprised of government, commercial, and environmental entities, to examine navigation safety issues within New England waters. Based on RRAT recommendations, the USCG implemented a Regulated Navigation Area (RNA) that imposed certain requirements on single hull tank barges transiting New England waters, including Buzzards Bay (33 Code of Federal Regulations [CFR] 165.100).

However, another oil spill occurred on April 27, 2003, when the Bouchard barge B-120, under tow and heading north into Buzzards Bay, ran aground in the vicinity of the southwest entrance to the Bay. The single hull barge, which was carrying approximately 97,619 barrels of No. 6 oil, suffered a 12 foot by 2 foot gash in its hull below the water line and released approximately 2,333 barrels of oil in the bay before the spill was controlled. Approximately 93 miles of coastline was polluted, more than 450 birds were killed, and thousands of acres of shellfish beds were shut down by the spill.

At this time, the Commonwealth of Massachusetts passed the Massachusetts Oil Spill Prevention and Response Act (MOSPA) which was last amended in 2004. These state rules regulated the conditions under which tank barges carrying 6,000 or more barrels of oil could transit Buzzards Bay and other waters of the Commonwealth. In 2005, the USCG filed suit asserting that federal law was sovereign in this case.

Also subsequent to the barge B-120 spill in April 2003, the USCG conducted a formal Ports and Waterways Safety Assessment (PAWSA) for Buzzards Bay to obtain expert judgments on the level of waterway risk and potential mitigation. The PAWSA was conducted by a cross-section of key Buzzards Bay waterways users and stakeholders and included multiple steps that, among other things, evaluated the potential significance of each identified risk and the effectiveness of existing mitigation strategies in reducing risk; identified new ideas for further reducing risk; and weighed the effectiveness of various intervention actions in reducing unmitigated risk. The PAWSA concluded that the risk for oil or hazardous material discharge in Buzzards Bay was still relatively high and made suggestions for improving navigation safety in the bay.

1.2 Purpose and Need for the Action

In 2007 the United States Coast Guard (USCG) published a Final Rule to implement amendments to the existing Regulated Navigation Area (RNA) applicable to tank barges carrying 5,000 or

more barrels of oil on First Coast Guard District waters. The purpose of this action was to further reduce the probability of an incident that could result in the discharge or release of oil or hazardous material, or cause serious harm, to navigable waters of the United States. This goal was in keeping with the mandates of the Ports and Waterways Safety Act which declared that "increased supervision of vessel and port operations is necessary in order to reduce the possibility of vessel or cargo loss, or damage to life, property, or the marine environment; and to ensure that vessels operating in the navigable waters of the United States shall comply with all applicable standards and requirements for vessel construction, equipment, manning and operational procedures." The findings and recommendations of the PAWSA conducted after the April 2003 oil spill were considered in developing the 2007 RNA amendments. Prior to implementing the 2007 federal amendments Final Rule, the USCG prepared a Categorical Exclusion Determination as defined in its Agency Procedures for Implementing the National Environmental Policy Act (NEPA).

The 2007 federal Final Rule applies only to single hull tank barges carrying oil or hazardous material, which are being phased out of operation (to be complete on December 31, 2014) under the Federal Oil Pollution Act of 1990 (OPA 90). Consequently, after December 31, 2014, the vessels subject to regulation under the 2007 amendments will no longer be in operation on Buzzards Bay.

In a ruling on May 17, 2011, the 1st U.S. Court of Appeals for the First Circuit determined that the USCG "failed to comply with its obligations under the National Environmental Policy Act" when it failed to prepare an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) in connection with the 2007 RNA amendments. The court did not address the preemption issue. [see *U.S. v. Coalition for Buzzards Bay et al.,* 644 F. 3d. 26 (1st Cir. 2011)].

In response to the Court determination, this Environmental Assessment provides a complete and objective analysis of the impacts of the Buzzards Bay 2007 RNA amendments and alternatives in greater depth and detail than was conducted in the previously prepared Categorical Exclusion Determination. This document compares the reasonable alternative amendment scenarios (Alternatives 2 through 5) against the baseline of the RNA that was in effect prior to 2007 (The "No Action" Alternative 1) and identifies the preferred alternative (Alternative 3a - the amendments published in the 2007 Final Rule) which will produce the greatest reduction in the risk of a release of hazardous cargo to Buzzards Bay through the measured use of operational controls and increased tank vessel structural integrity (i.e. double hulled vs. single hulled vessels).

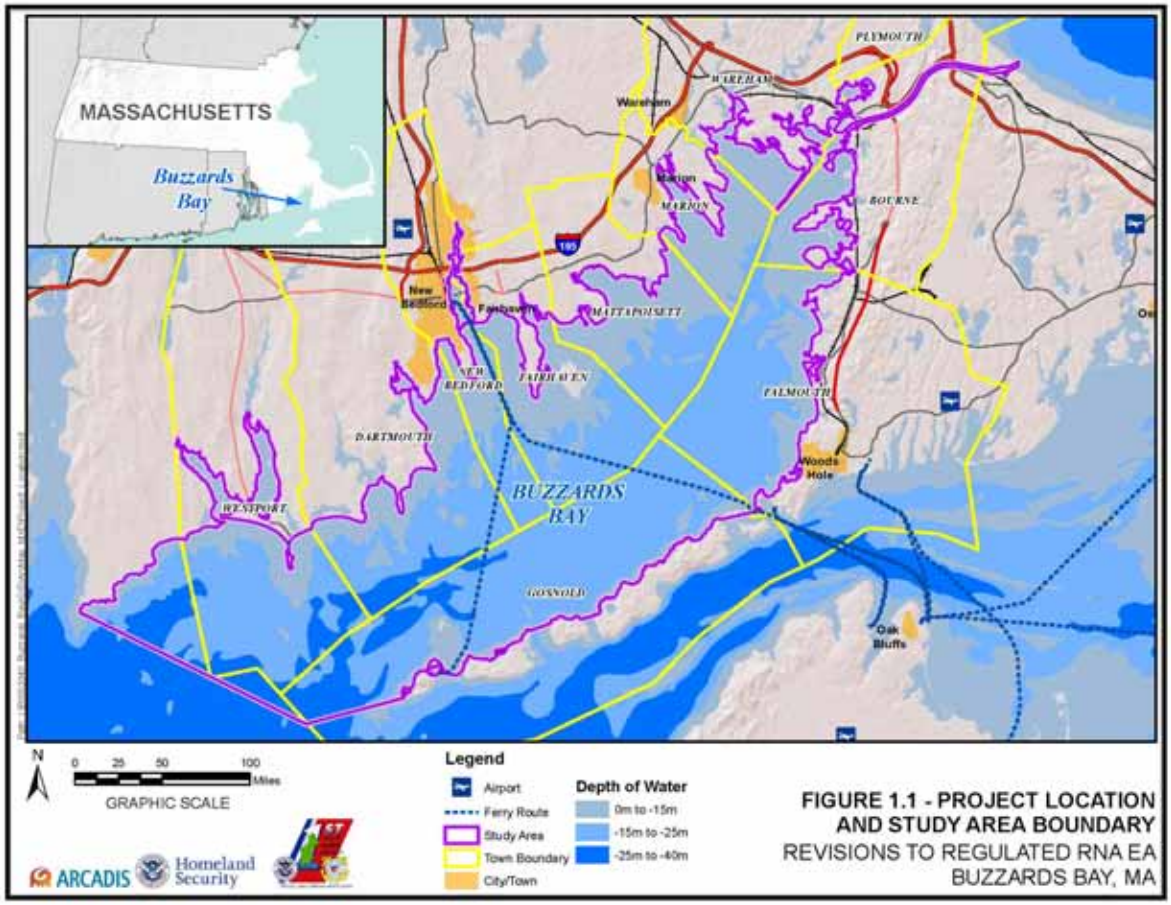
This Environmental Assessment was prepared in accordance with NEPA (42 USC §§4321 et. seq.); Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR §§1500-1508) and associated CEQ guidelines; Department of Homeland Security Management Directive 5100.1, Environmental Planning Program; and USCG Commandant Instruction (COMDTINST) M16475.1D, National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts.

1.3 Project Scope and Area

The analysis reported in this EA focuses on specific alternatives for minimizing the potential for incidents that could result in the discharge or release of oil or hazardous material, or cause serious harm, to navigable waters of Buzzards Bay. The geographic bounds of Buzzards Bay as discussed in this EA are from Sakonnet Point southward to the north end of the Buzzards Bay traffic separation zone, to the southwestern tip of Cuttyhunk Island through Buzzards Bay to the eastern entrance of the Cape Code Canal; Woods Hole Passage and Quicks Hole are included in the study area. Figure 1.1 shows the location and boundaries of Buzzards Bay.

This EA includes a discussion of potential navigational, biological and socioeconomic issues associated with each alternative (alternatives are identified and described in Section 2) and is intended as a tool to

aid the USCG in making an informed decision on which alternative provides the best protection when balanced with the other pertinent issues that must be considered.



1.4 Agency and Public Involvement Process

The following federal and state agencies were notified that this EA was being prepared:

- National Marine Fisheries Service (NMFS), Gloucester, MA
- United States Fish and Wildlife Service (USFWS), Concord, NH
- Massachusetts Historical Commission, Boston, MA
- Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA

The USFWS was the only agency to respond, as of publication of this EA. It indicted that two federally listed threatened bird and one federal candidate bird species are known to occur in the project area. Copies of the communications sent to the agencies and the response from the USFWS are included in Appendix A.

The Commonwealth of Massachusetts, Attorney General's office was also consulted regarding alternatives to be considered.

Prior to finalization of the 2007 Final Rule, the USCG contacted the Massachusetts Coastal Zone Program (MCZP), which declined to review the Rule on the basis that it was not listed within the State's program as an activity likely to affect the State's coastal zone. Since this EA is being written with a baseline that predates promulgation of the 2007 Final Rule, the MCZP decision is considered to be still valid for this analysis.

1.5 Summary of Key Environmental Compliance Requirements

Environmental regulations relevant to this environmental assessment include, but are not limited to, the following:

- National Environmental Policy Act of 1969, 42 USC §§ 4321 et. seq., establishes national environmental policy, including a multidisciplinary approach to considering environmental effects in federal government agency decision making and the procedural requirements for all federal government agencies to prepare EAs and EISs. The act also established the CEQ.

- COMDTINST M16475.1D, establishes the USCG's procedures and policy for implementing NEPA and for considering environmental impacts.

- 40 CFR §§1500-1508 establishes CEQ regulations for implementing NEPA.

- Ports and Waterways Safety Act (PWSA), P.L. 95-474, 33 U.S.C. 1223(c), is designed to promote navigation, vessel safety, and protection of the marine environment. It authorizes the USCG to establish vessel traffic service/separation schemes (VTSS) for ports, harbors, and other waters subject to congested vessel traffic. The PWSA was amended by the Port and Tanker Safety Act (PTSA) of 1978.

- Ports and Tanker Safety Act (PTSA), PL 95-474, provides regulatory authority over the supervision and control of vessels operating in U.S. navigable waters, and in the safety of foreign or domestic tank vessels that transport or transfer oil or hazardous cargoes in ports or places subject to United States jurisdiction.

- Coastal Zone Management Act (CZMA), calls for the "effective management, beneficial use, protection, and development" of the nation's coastal zone and requires participating states to develop management programs for their coastal zones. The Massachusetts Coastal Zone Management Office under the Massachusetts Executive Office of Environmental Affairs is responsible for administering the Massachusetts CZM Program (MCZMP). The CZMA also requires federal agencies to conduct and direct their licensing activities in a manner consistent with the state's approved coastal program policies to the maximum extent practicable not otherwise prohibited by applicable law.

- Magnuson-Stevens Fishery Conservation and Management Act, P.L. 104-267, establishes procedures to identify, conserve, and enhance essential fish habitat (EFH).

- Endangered Species Act (ESA), 16 USC 1531 et seq., mandates that any project authorized, funded, or conducted by a federal agency should not "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined…to be critical." Under Section 7, the USCG is required to "informally" consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration National Marine Fisheries Service

(NMFS) to determine if any federally listed or proposed endangered or threatened species or their designated critical habitats occur in the project area and could be adversely impacted by the proposed action.

- Marine Mammals Protection Act, 16 U.S.C. 31 et seq., prohibits the "take" of marine mammals, with certain exceptions, in waters of the U.S. and requires consultation with the NMFS if impacts on marine mammals are unavoidable. Section 3 of the act defines a "take" as "harass, capture, hunt, kill, or attempt to harass, capture, hunt, or kill any marine mammal."

- Migratory Bird Treaty Act (MBTA), 16 USC 703-712, protects species or families of birds that live, reproduce, or migrate within or across international borders during their life cycle. The MBTA provides that among other things, it is unlawful to kill any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior.

- National Historic Preservation Act, as amended, 16 USC 470 et seq., requires federal agencies to consider the effects of their undertakings on properties listed or eligible for listing in the National Register of Historic Places.

- Executive Order 11514, Protection and Enhancement of Environmental Quality, instructs federal agencies to take a leadership role in protecting and enhancing environmental quality.

- The 1st U.S. Circuit Court of Appeals ruling pertaining to the USCG's NEPA analysis for the 2007 Final Rule. Determined that the USCG failed to comply with its obligations under NEPA when it failed to prepare an EIS or an EA on the 2007 Final Rule to implement RNA amendments.

- Oil Pollution Prevention and Response Act of 2007, provides the USCG and national Oceanic and Atmospheric Administration (NOAA) with additional authorities under the Oil Pollution Act of 1990, to strengthen the Oil Pollution Act of 1990, and for other purposes.

- Oil Pollution Act of 1990 (OPA), mandates the phase out of single hull, oil-carrying vessels by 2015 and requires all oil-carrying vessels from January 1, 2015 on to have double hulls.

1.6 Organization of the EA

This EA is organized in the following sections: Section 1 describes the purpose and need for the EA as well as the boundaries of the project area and environmental compliance requirements. Section 2 describes alternatives that are evaluated herein as well as those that were discarded as not meeting the purpose or need. Chapter 2 also provides a summary comparison of the environmental effects of the alternatives considered in this EA. Section 3 sets the stage for the analysis by describing pre-2007 RNA conditions (those that existed prior to the enactment of the 2007 Final Rule) and Section 4 identifies the potential beneficial and adverse impacts of each alternative by resource area. Cumulative impacts are described in Section 5.

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2 ALTERNATIVES CONSIDERED

2.1 Identification of Alternatives

This section identifies the alternatives that are considered in this EA. The following text provides a summary of each alternative and Table 2-1 provides details on the elements included in each alternative.

2.1.1 Alternative 1 - No Action

Under the No Action alternative, navigation in Buzzards Bay would follow the USCG regulations that were in effect prior to the promulgation of the August 30, 2007 Final Rule amending the RNA, including provisions regarding positive control for barges, enhanced communications, voyage planning, and navigation restriction areas. A copy of the pertinent CFR section reflecting the RNA prior to the 2007 Final Rule is provided in Appendix B.

2.1.2 Alternative 2

Alternative 2 would maintain the baseline level of protection provided by USCG and Massachusetts laws and regulations in place before the USCG promulgated the 2007 Final Rule for Buzzards Bay on August 30, 2007 and after the U.S. Court of Appeals for the First Circuit vacated the injunction that prevented enforcement of the Massachusetts laws on July 11, 2011 (e.g., 33 CFR § 165.100 (2007); Massachusetts Oil Spill Prevention Act (MOSPA), Massachusetts General Law (MGL) 21M, §§ 1, 4, and 6).

Section 4 of MOSPA establishes enhanced personnel requirements for vessels towing single hull barges loaded with 6,000 or more barrels of oil in Buzzards Bay and the Cape Cod Canal. Section 6 of MOSPA requires both single and double hull tank barges loaded with 6,000 or more barrels of oil to hire a tugboat escort that meets specified regulatory standards to accompany them through Buzzards Bay and the Cape Cod Canal.

2.1.3 Alternative 3

Alternative 3 would be to promulgate a final rule that retains the 2007 Final Rule and would require: (1) a federally licensed pilot, not a member of the crew, on each vessel towing a single hull tank barge transporting 5,000 or more barrels of oil or hazardous material through Buzzards Bay and the Cape Cod Canal, 33 CFR § 165.100(d)(5)(iii) (2010); (2) a tugboat escort for all single hull tank barges transporting 5,000 or more barrels of oil or hazardous material through Buzzards Bay and the Cape Cod Canal, 33 CFR. § 165.100(d)(5)(ii) (2010); and (3) the Vessel Movement Reporting System (VMRS), 33 CFR §165.100(d)(5)(iv) (2010); and:

> (a) represents the 2007 Final Rule and does not incorporate the protections provided for in sections 4 (enhanced personnel requirements for single hull barges and their towing vessels transporting 6,000 or more barrels of oil through Buzzards Bay and the Cape Cod Canal) and Section 6 (tugboat escort for both single and double hull barges transporting 6,000 or more barrels of oil through Buzzards Bay and the Cape Cod Canal) of MOSPA, MGL 21M, §§ 1, 4, and 6; **or**
>
> (b) does incorporate the protections provided for in sections 4 (enhanced personnel requirements for single hull barges and their towing vessels transporting 6,000 or more barrels of oil through Buzzards Bay and the Cape Cod Canal) and Section 6 (tugboat escort for both single

and double hull barges transporting 6,000 or more barrels of oil through Buzzards Bay and the Cape Cod Canal) of MOSPA, (MGL 21M, §§ 1, 4, and 6).

2.1.4 Alternative 4

Under Alternative 4, a final rule would be promulgated that retains the 2007 Final Rule's requirements (as specified in Alternative 3 above) and extends the 2007 Final Rule's federally licensed pilot, not a member of the crew, on each vessel towing a single or double hull tank barge transporting 5,000 or more barrels of oil or hazardous material through Buzzards Bay and the Cape Cod Canal (33 CFR §165.100(d)(5)(iii) [2010]) and tugboat escort for all single hull tank barges transporting 5,000 or more barrels of oil or hazardous material through Buzzards Bay and the Cape Cod Canal (33 CFR § 165.100(d)(5)(ii) [2010] requirements to all double hull tank barges transporting 5,000 or more barrels of oil or other hazardous material through Buzzards Bay. This alternative assumes that sections 4 and 6 of MOSPA (MGL 21M, §§ 1, 4, and 6) will be rendered largely duplicative and therefore are not analyzed.

2.1.5 Alternative 5

Alternative 5 would include the requirements of the 2007 Final Rule (Alternative 3a) with the exception that only those barges laden with 5,000 or more barrels of petroleum or other hazardous material, whether single or double hull, would be required to participate in and be actively monitored by the VMRS. Alternative 3a applies to all vessels towing a tank barge regardless of the size of the barge. Under Alternative 5, the number of monitored vessels would decrease from approximately 7,000 per year to about 600 per year.

Table 2-1. Components of the Alternatives Considered in this EA

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				
Alternative 1 (No Action)	• Escort tug required for single hull barges carrying petroleum cargo in bulk and being towed by a single screw tug and for any vessel engaged in towing any tank barge in the event of a casualty that impairs navigation and/or seaworthiness of the barge. • Any tank barge with a capacity of <25,000 barrels operating in limited depth/width or any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug is exempt from the escort tug requirement.	• None	• None	• Every vessel towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.	• Towing vessel owner / Operator must prepare a written voyage plan for each transit.	• None
Alternative 2	• Escort tug required for all single and double hull tank barges carrying **≥6,000** barrels of petroleum if not self-propelled. • Any tank barge with a capacity of >25,000 barrels operating in limited depth/width or any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug is exempt from the escort tug requirement with authorization from the Captain of the Port.	• State-licensed pilot required for single hull barge if tank barge is not accompanied by an escort tug. • The tow vessel master is not required to allow pilot onboard, therefore, pilot may have to direct and control primary tow vessel from aboard the escort tug.	• Towing vessels carrying **≥6,000** barrels of oil (no other petroleum products specified) must have onboard one licensed deck officer or vessel operator serving as lookout and three licensed officers or tow vessel operators on tow vessel. Only applicable to vessels carrying oil. • Tank barges must have onboard at all times one certified tanker-man and one other crew member.	• Towing vessels must report to the Vessel Traffic System (VTS) and maintain communication / radio monitoring. • Must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places including Buzzards Bay Entrance Light, Buzzards Bay Mid-channel Light, and Cleveland East Ledge Light.	• Same as Alternative 1. Towing vessel owner / Operator must prepare a written voyage plan for each transit.	• Mandatory travel within USCG designated vessel route unless special circumstances require diversion to avoid imminent navigation hazard.

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				

Alternative 3a	• Escort tug required for single hull tank barges carrying **≥5,000** barrels.
	• Same escort tug exemption as Alternative 1.
		• Federal pilot, not a member of the crew, required for all single hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• None	• All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				  • Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner / Operator must prepare a written voyage plan for each transit.	• USCG requests but does not mandate use of vessel routes on navigation charts.

Alternative 3b	• Escort tug required for single **and** double hull tank barges carrying **≥5,000** barrels of oil or other hazardous.
	• Same escort tug exemption as Alternative 1.
		• Federal pilot, not a member of the crew, required for single hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• Same as Alternative 2. Towing vessels carrying **≥6,000** barrels of oil (no other petroleum products specified) must have onboard one licensed deck officer or vessel operator serving as lookout and three licensed officers or tow vessel operators on tow vessel. Only applicable to vessels carrying oil.
			• Tank barges must have onboard at all times one certified tanker-man and one other crew member
				• Same as Alternative 3a. All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				  • Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner / Operator must prepare a written voyage plan for each transit.	• Same as Alternative 3a. USCG requests but does not mandate use of vessel routes on navigation charts.

	Positive Control		Manning	Communications	Voyage Planning	Restricted Navigation
	Size/Escort Tug	**Pilot**				

Alternative 4	• Escort tug required for double **and** single hull tank barges (not tank ships) carrying **≥5,000** barrels of oil or other hazardous substance.
	• Same escort tug exemption as Alternative 1
		• Federal pilot, not a member of the crew, required for single **and** double hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• None	• Same as Alternative 3a. All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				  • Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner / Operator must prepare a written voyage plan for each transit.	• Same as Alternative 3a. USCG requests but does not mandate use of vessel routes on navigation charts.

Alternative 5	• Escort tug required for single **and** double hull tank barges carrying **≥5,000** barrels of oil or other hazardous.
	• Same escort tug exemption as Alternative 1.
		• Federal pilot, not a member of the crew, required for all single hull tank barges carrying **≥5,000** barrels of oil or other hazardous substance.
		• The pilot must direct and control from the primary towing vessel.
			• None	• .All vessels towing a tank barge must communicate on VHF 13 or 16 and issue security calls when approaching one of 21 specified places.
				• Tank barges carrying **≥5,000** barrels of oil or other hazardous substance transiting VMRS Buzzards Bay that are equipped with bridge-to-bridge radiotelephone
				  • Must not enter or get underway without notifying VRMS.
				  • May not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition exists.
				  • Must use the shortest, safest tow hawser possible
				  • Must communicate using bridge-to-bridge radiotelephone before meeting, crossing, or overtaking another VMRS user.
					• Same as Alternative 1. Towing vessel owner / Operator must prepare a written voyage plan for each transit	• Same as Alternative 3a. USCG requests but does not mandate use of vessel routes on navigation charts.

2.2 Alternatives Considered but Eliminated from Further Analysis

The requirement to establish minimum horsepower or bollard pull requirements for escort tugs was considered as a potential option. The pre-2007 RNA defines an escort tug as a vessel of "sufficient capability to promptly push or tow the tank barge away from danger of grounding or collision." The definition is the direct product of the RRAT and was directed by Congress to be adopted. The USCG believes this definition to be sufficient and discarded this option from further consideration.

2.3 Resources Eliminated from Detailed Analysis

CEQ regulations (§1501.7) state that the lead agency shall identify and eliminate from detailed study the issues or resources that are not important or have been covered by prior environmental review, narrowing the discussion of these issues in the document to a brief justification that demonstrates a minor impact on the human environment. It was determined that the following resources would not be affected by the alternatives considered in this EA. As a result, they were not analyzed as part of this review.

2.3.1 Visual/Aesthetic Resources

Visual or aesthetic resources would not be substantially affected by implementation of any of the alternatives being considered in this EA. The addition of escort tugs would not appreciably change the profile or visibility of commercial barges when viewed from shore, and, although the visual evidence of an oil spill on shorelines and beaches would be adverse, the visual effects would not vary substantially between the alternatives. Consequently, visual and aesthetic resources are not evaluated in this EA.

2.3.2 Noise

Although the addition of escort tugs would potentially increase noise levels under some of the alternatives being considered, the increase over existing noise levels on Buzzards Bay is not anticipated to be substantial. Further, since any noise changes would be from moving sources, the noise effects should be of short-term duration and variable based on atmospheric conditions and other vessel traffic in the area. Therefore, noise impacts of the alternatives are not evaluated in this EA.

2.3.3 Cultural Resources

Cultural resources are not addressed in this EA since historic properties and archaeological sites would not be affected by any of the alternatives. Therefore, cultural resources are not evaluated in this EA.

2.3.4 Air Quality

Although the increased use of tug escorts would add airborne pollutants to the region, the impact would be negligible when compared to the existing commercial traffic in Buzzards Bay. Therefore, air quality is not evaluated in this EA.

2.3.5 Water Quality

The addition or elimination of escort tugs would not have a substantial impact on water quality since they are not allowed to discharge sanitary waste or bilge water in Buzzards Bay. Therefore, water quality is not evaluated in this EA.

2.3.6 Geology and Soils

Geology and soils are not discussed in this EA since the alternatives would not affect or be affected by those resources.

2.3.7 Environmental Justice

Environmental Justice is not addressed in this EA since implementation of any of the alternatives would not disproportionately affect any particular minority or disadvantaged human population group and the reduction in risk from a spill would be beneficial.

2.3.8 Protection of Children from Environmental, Health, and Safety Risks

Protection of children from environmental, health, and safety risks is not addressed in this EA since the impact of an oil spill would be identical regardless of which alternative was implemented. In addition, the reduced probability of a spill that would result from implementation of any of the action alternatives would be beneficial.

2.4 Comparison of Environmental Effects of All Alternatives

The analysis performed for this EA indicates that while all of the action alternatives (Alternatives 2 through 5) would reduce the probability of an accident with the potential for the release of oil occurring in Buzzards Bay, Alternative 3a, the 2007 Final Rule, will likely be the preferred alternative since it would cause the least adverse environmental impact while providing substantial risk reduction with the incentive to proceed at a more accelerated pace than other alternatives.

By requiring escort tugs and federal pilots for single-hull barges only, it is anticipated that Alternative 3a would provide a financial incentive to barge owners/operators to choose to utilize double hull barges sooner than the 2015 deadline when the phase-out of single hull vessels will be complete. By accelerating the reduction in the use of single hull tank barges, the risk of an incident resulting in the release of hazardous materials is expected to be reduced faster than would occur under the other alternatives.

Improved communications will provide a substantial reduction in the risk of collisions by creating increased navigational and situational awareness. Alternative 3a includes the most stringent and immediate communication requirements for all tank barges (not just single hull barges) entering and transiting the bay. Because this requirement affects all tank barges, it will remain in place even after single hull barges are phased out of service. While the VTS system specified in Alternative 2 would be beneficial, it is not yet available in Buzzards Bay and would, therefore provide no immediate benefit.

Finally, because it doesn't require as many additional vessels (escort tugs) as Alternatives 2, 3b and 4, Alternative 3a would have less potential for adverse direct impact on aquatic animals and plants.

Table 2-2 provides a summary comparison of the impacts of each of the alternatives. Note that in this table "no impact" indicates that there would be no change from pre-2007 RNA conditions.

Table 2-2. Summary of Environmental Findings

Resource/Issue	Alternative					
	Alternative 1 (No Action)	Alternative 2	Alternative 3a	Alternative 3b	Alternative 4	Alternative 5
Navigation & Vessel Movement [Benefit to the environment is derived from the reduction in potential for occurrence of a marine incident (grounding, allusion, collision) that could result in a release of hazardous cargo. This benefit is conditional based on the type of tank vessel involved.]						
Positive Control	No impact.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.	Minor to substantial increase in control due to tug and pilot requirements.
Manning	No impact.	Substantial benefit from requirement for dedicated lookout requirement.	Substantial benefit from requirement for pilot to be on primary towing vessel.	Substantial benefit from dedicated lookout requirement.	Substantial benefit from requirement for pilot to be on primary towing vessel.	Substantial benefit from requirement for pilot to be on primary towing vessel.
Communications	No impact.	Negligible benefit from communications requirement.(VTS not yet developed)	Very substantial benefit from communications requirements.	Very substantial benefit from communications requirements.	Very substantial benefit from communications requirements.	Very substantial benefit from communications requirements.
Voyage Planning	No impact.	No impact.	No impact.	No impact.	No impact.	No impact
Restricted Navigation	No impact.	Minor benefit.	No impact.	No impact.	No impact.	No impact

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Biological Resources						
Eelgrass and Salt marsh Habitats	No impact.	Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.
Benthic Communities	No impact.	Minor long-term adverse impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	. Minor to substantial increase in protection from oil spill compared to Alternative 1.
Shellfish	No impact.	Minor long-term adverse impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact from increased vessel traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.
EFH	No impact.	Minor long-term adverse impact from increased traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact from increased traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact from increased traffic (tug escorts). Substantial increase in protection from oil spill compared to Alternative 1.	Minor to substantial increase in protection from oil spill compared to Alternative 1.

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Protected Species	No impact.	Minor long-term adverse impact from increase in potential hazard of ship strikes with protected species from additional traffic (tug escorts). Potential beneficial long-term impact through dedicated lookouts. Substantial increase in protection from oil spill compared to Alternative 1.	Potential beneficial long-term impact through improved vessel communications. Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact through increase in potential hazard of ship strikes with protected species from additional traffic (tug escorts). Potential long-term benefit impact through improved vessel communications and dedicated lookout. Substantial increase in protection from oil spill compared to Alternative 1.	Minor long-term adverse impact through increase in potential hazard of ship strikes with protected species from additional traffic (tug escorts). Potential beneficial long-term impact through improved vessel communications. Substantial increase in protection from oil spill compared to Alternative 1.	Potential beneficial long-term impact through improved vessel communications. Minor to substantial increase in protection from oil spill compared to Alternative 1
Socioeconomics						
Population	No impact	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.
Recreation	No impact	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.	Beneficial impact through increased protection from oil spills.

Resource/Issue	Alternative					
	Alternative 1 (No Action)	**Alternative 2**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**	**Alternative 5**
Economy	No impact	Beneficial impact to municipalities through increased protection from oil spills. Short-term minor economic costs to Massachusetts for state-licensed pilots.	Beneficial impact to municipalities through increased protection from oil spills. Short-term, minor adverse financial impact to barge owners for pilot fees. Short-term economic benefits to federal pilots. Substantial benefit through economic incentive for less use of single hull barges in advance of 2015 phase out deadline.	Beneficial impact to municipalities through increased protection from oil spills. Long-term adverse financial impact to barge owners for tug escort and pilot fees. Long-term economic benefits to escort tug owners and federal pilots.	Beneficial impact to municipalities through increased protection from oil spills. Long-term adverse financial impact to barge owners for tug escort and pilot fees. Long-term economic benefits to escort tug owners and federal pilots.	Beneficial impact to municipalities through increased protection from oil spills. Short-term, minor adverse financial impact to barge owners for pilot fees. Short-term economic benefits cost to federal pilots.
Employment	No impact	Potential minor long-term beneficial impacts if additional pilots are required.	Potential minor short-term beneficial impacts if additional pilots are required.	Potential minor long-term beneficial impacts if additional pilots are required.	Potential minor long-term beneficial impacts if additional pilots are required.	Potential minor short-term beneficial impacts if additional pilots are required.
Public Health and Safety						
Public Health and safety	No change in impact.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect substantial benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.	Indirect benefit through reduction in risk of exposure to an oil spill.

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3 AFFECTED ENVIRONMENT

3.1 Introduction

3.1.1 Resources for Analysis

This section describes the navigational, environmental and socioeconomic conditions most likely to be affected by implementation of any of the alternatives and serves as the baseline against which potential impacts will be identified and evaluated. In compliance with NEPA and CEQ guidelines, the description of the affected environment focuses on those conditions and resource areas potentially affected by the alternatives. These resources include navigation and vessel movement, biological resources, and socioeconomics. Environmental resources and conditions that are not present in the area or that would not be affected by implementation of any of the alternatives are listed in Section 2.3 of this EA, along with the reasons for why they are not analyzed in depth in this assessment.

3.1.2 Region of Influence

The study area for analysis as discussed in this EA is from Sakonnet Point southward to the north end of the Buzzards Bay traffic separation zone, to the southwestern tip of Cuttyhunk Island through Buzzards Bay to the eastern entrance of the Cape Code Canal; Woods Hole Passage and Quicks Hole are included in the study area. Figure 1.1 shows the boundaries of the study area.

3.1.3 Environmental Regulations, Laws, and Executive Orders

Environmental regulations, laws, and executive orders that are applicable to this EA are listed in Section 1.5 of this EA.

3.2 Navigation and Vessel Movement

This section describes the existing navigational environment for commercial barges carrying petroleum and/or other hazardous cargo through Buzzards Bay prior to implementation of the 2007 Coast Guard Final Rule. Included in this section is a discussion of the navigational requirements of commercial cargo vessels entering and transiting the bay.

3.2.1 Definition of the Resource

The study area for navigation and vessel movement is Buzzards Bay and the Cape Cod Canal, as described in Section 1.3 and shown on Figure 3.1.

3.2.2 Affected Environment

Buzzards Bay is a major channel of maritime commerce in southeastern Massachusetts due to its connection to the Cape Cod Canal and the Port of New Bedford. Buzzards Bay is also home to a very active recreational boating community. The Cape Cod Canal is the widest sea level canal in the world and the Port of New Bedford is ranked first in the nation in revenue generated from fish landings (The Port of New Bedford 2012). Buzzards Bay is a toll-free waterway that maintains an active two-way (inbound/outbound) traffic scheme and is open for passage to all seaworthy vessels.

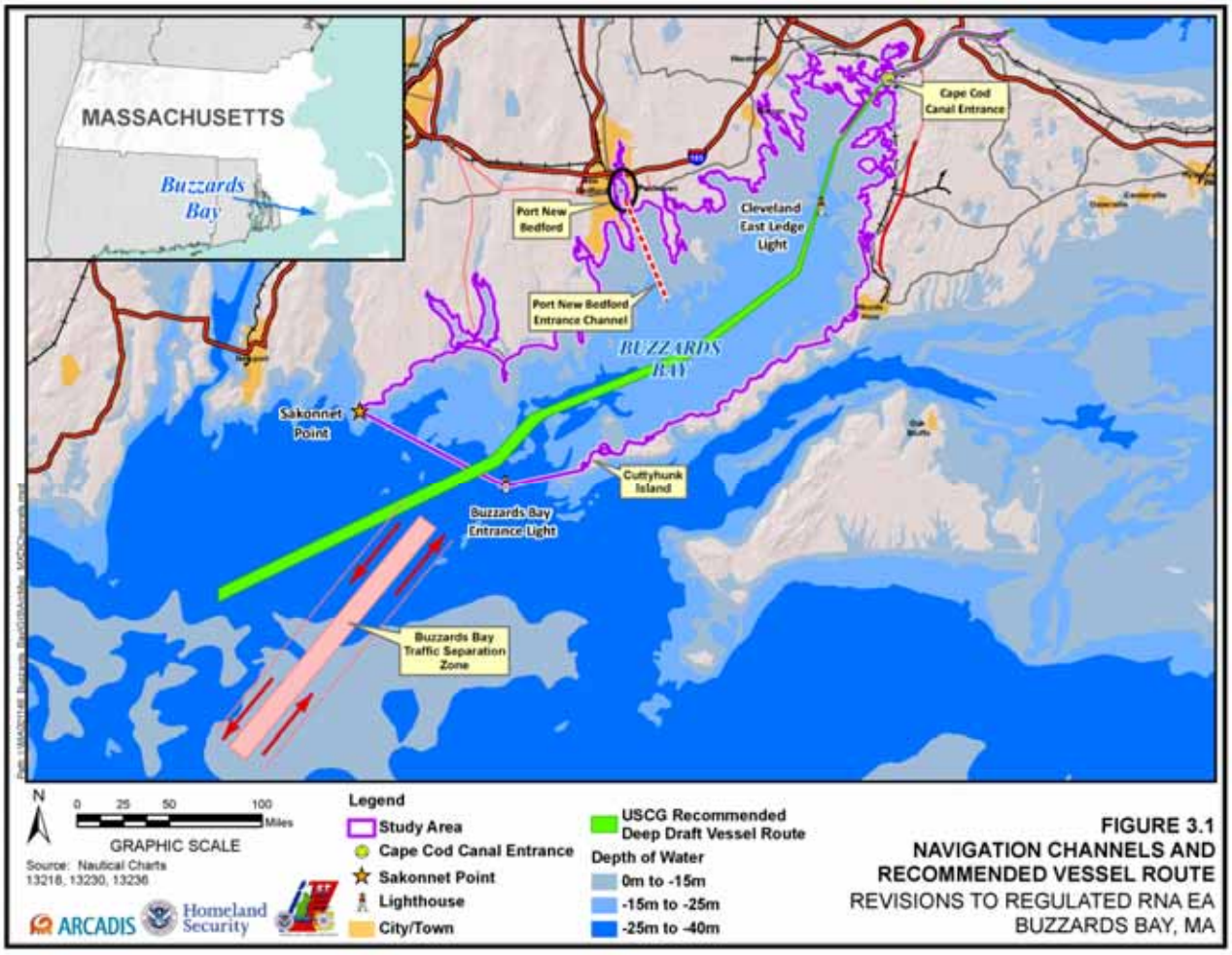


FIGURE 3.1
NAVIGATION CHANNELS AND RECOMMENDED VESSEL ROUTE
REVISIONS TO REGULATED RNA EA
BUZZARDS BAY, MA

The USCG mandated that all single hull vessels be phased out by January 1, 2015, in accordance with the double hull requirement mandated by the Oil Pollution Act of 1990. As U.S. single hull oil vessels are eliminated, fewer double hull vessels are replacing them (USGAO, 2000). As the total number of oil-carrying vessel transits through Buzzards Bay declines, the ratio of single hull to double hull vessels continues to decrease, and the probability of a marine incident inevitably decreases. In 2002, there were nearly 10,000 commercial vessel transits and more than 1,200 tank barge transits through Buzzards Bay; an estimated 80 percent of those tank barges were single hull (TWG 2009). In 2006, approximately 560 oil-carrying barges transited Buzzards Bay, 50 percent of which were single hull barges (U.S. Army Corps of Engineers [USACE] 2012c).

While there are no mandatory nautical pilot requirements for commercial vessels entering and transiting Buzzards Bay, MOSPA mandates that tank barges carrying 6,000 or more barrels of petroleum cargo must be provided a nautical pilot at the state's expense if requested by the tow barge master. The tow barge master must provide a minimum 24-hour advance notice of transit to be eligible for this accommodation (MGL 21M-9).

The USCG has identified and recommended deep draft vessel routes for commercial vessels entering and departing Buzzards Bay, all of which have been overlaid onto Buzzards Bay navigational charts (see Figure 3-1). These vessel routes are not mandatory, although deep draft commercial vessels, including tugs and barges (average draft of 9 to15 ft), are requested to follow the designated routes at the master's discretion. Currently, most if not all tank barges use the suggested routes voluntarily (Federal Register 2007). By not mandating their use, the USCG affords commercial vessel masters the freedom to abandon the recommended routes if necessary to avoid the risk of collision or grounding.

As shown on Figure 3-1, the USCG's recommended vessel route through Buzzards Bay maintains a buffer of approximately one to three nautical miles (nm) from shoal water and land formations on both sides of the route. The recommended route extends from the bay's west entrance to the Cleveland East Ledge Light, marking the start of the channel 4.5 nm in length leading to Cape Cod Canal.

The transit through Buzzards Bay to the Cape Cod Canal is approximately 25 to 30 nm from the west entrance of the bay to the west end of the Cape Cod Canal, depending on where a vessel enters the bay. Figure 3-1 shows the channel to the Canal. Use of the Canal saves mariners an average of 135 miles of travel that would otherwise be required to circumnavigate around Cape Cod. More than 20,000 vessels, of all types, transit the canal annually (USACE, 2012a).

Located on the southern Massachusetts coast, the Port of New Bedford, a designated Foreign Trade Zone, is a deep-water commercial port strategically positioned to support import and export trade. In 2006 there were 3,745 vessel transits through New Bedford Harbor, a decrease of about 14.5 percent since 2000 (HDR 2011). The Port of New Bedford Entrance Channel is approximately 15 nm from Buzzard Bay's west entrance (see Figure 3-1).

The pre-2007 RNA requires an escort tug for all single hull tank barges being towed through Buzzards Bay by a tug with single screw propulsion, regardless of cargo type. The Captain of the Port (COTP) may authorize an exemption from this requirement. By definition, an escort tug has twin-screw propulsion and twin engines. Consequently, the vast majority of tug and barge combinations transiting Buzzards Bay employ tugs with twin screws and twin engines, exempting them from employing an escort tug under this rule. The State of Massachusetts intends to partner with the USCG to develop and implement a Vessel Traffic System (VTS) to increase navigational awareness and to help prevent collisions and groundings by providing information regarding ship locations and traffic. Upon entering the Buzzards Bay RNA, this system will require vessels to report their location and identity, and voyage plan (location, course, speed, destination, estimated time of arrival) for transiting the bay, and to maintain continuous contact with the VTS monitor throughout the transit. (MGL.21M.s.2). To date, VTS has not been implemented; however, the USCG requires each vessel engaged in towing a tank barge in Buzzards Bay or the Cape Cod Canal to issue a security call on marine band or VHF channel.

3.3 Biological Resources

3.3.1 Definition of the Resource

This section describes the biological resources in the project area including aquatic communities, sensitive and protected habitats and threatened and endangered species in the proposed project location.

Buzzards Bay has 350 miles (563 kilometers [km]) of coastline that includes tidal wetlands or saltmarshes, tidal flats, eelgrass beds and barrier beaches (Howes and Goehringer 1996). Congress designated Buzzards Bay as an "Estuary of National Significance" in 1985, one of only five estuaries in the U.S. so designated. It is also a "Massachusetts designated Ocean Sanctuary".

3.3.2 Eelgrass and Saltmarsh Habitats

Eelgrass and saltmarshes are important habitats, nesting sites, food-production areas, and nurseries for a wide variety of species. Eelgrass (*Zostera marina*) is a perennial plant that grows in sands and muds in depths from low-tide to 20 feet (ft) (7 meters [m]) below sea level, depending on light penetration and absence of high energy wave action (BBNEP 2012). Eelgrass is found at the mouths of tidal creeks, salt ponds, and embayments and has declined as a result of pollution and human disturbances (Figure 3.2 shows the location of eelgrass beds in Buzzards Bay). Saltmarshes are usually located in the intertidal zone behind barrier beaches or in embayments with calm waters and along tidal rivers. They are dominated by the grasses *Spartina patens* and *Spartina alterniflora*.

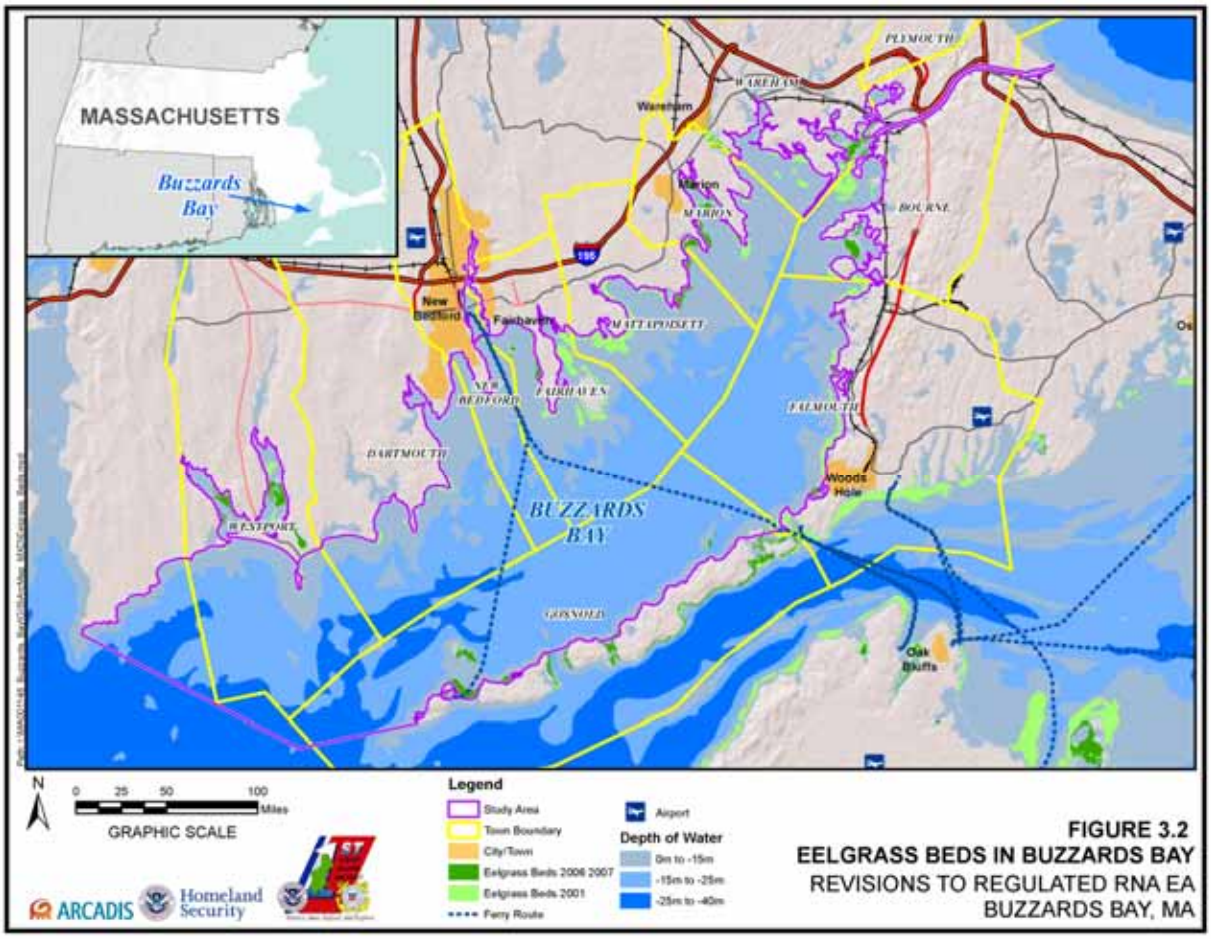


FIGURE 3.2
EELGRASS BEDS IN BUZZARDS BAY
REVISIONS TO REGULATED RNA EA
BUZZARDS BAY, MA

3.3.3 Benthic Communities

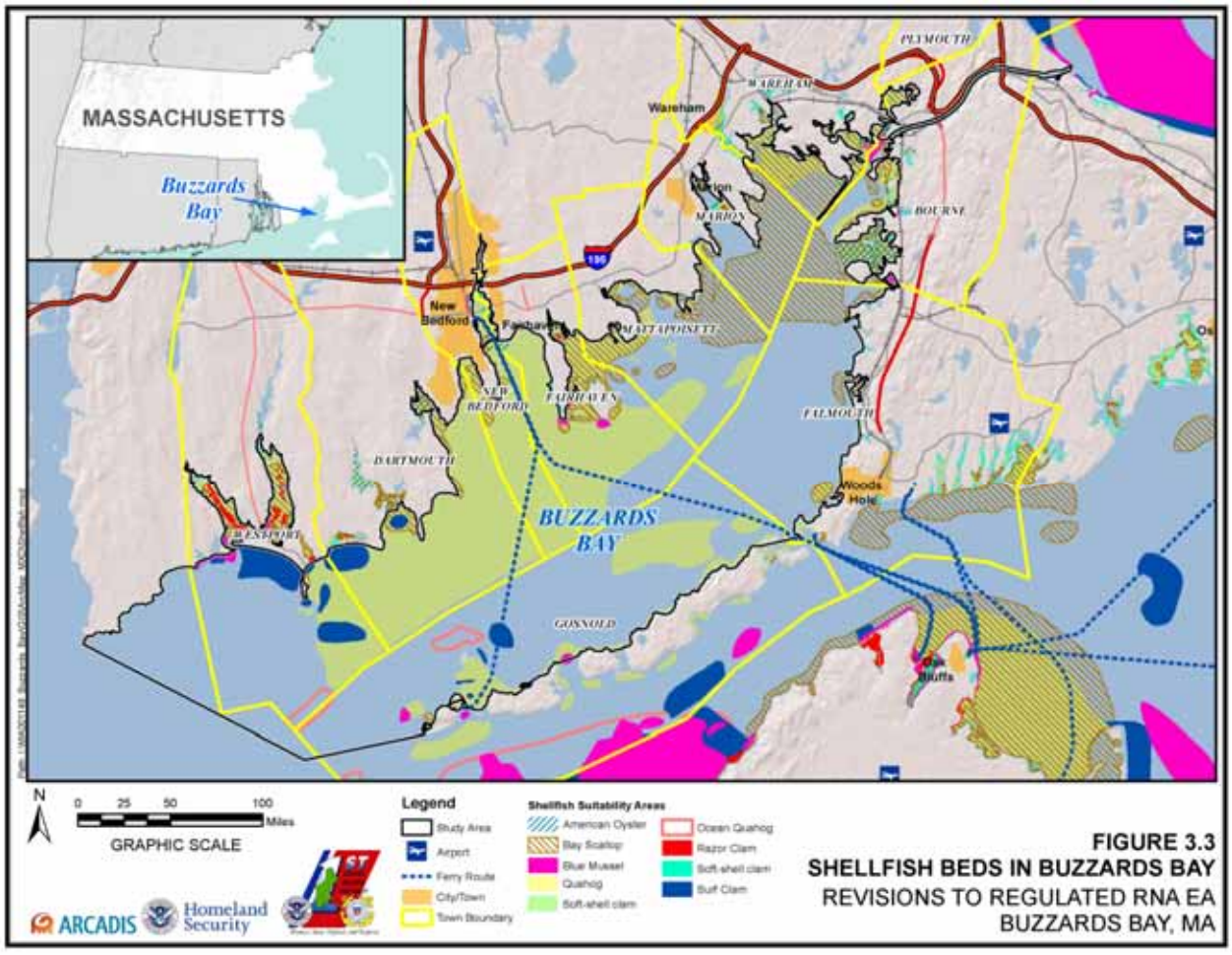
Buzzards Bay has fine-grained sediments that occur throughout the deeper basins and troughs, as well as in nearshore, shallow and protected areas such as saltmarshes, eelgrass beds and tidal flats. Coarser-grained sands are found in shallow, higher energy areas, for example by barrier beaches, as well as offshore areas: (Howes and Goehringer 1996). The benthic community structure of Buzzards Bay depends primarily on the varying sediment characteristics, including grain size and organic content, of the bay bottom.

Shallow areas and eelgrass beds that are characterized by fine-grained and muddier sediments are dominated by deposit feeders and molluscs (e.g. the polychaete *Nephtys incisa*, the lamellibranch *Nucula proxima*, the molluscs *Crepidula fornicata* and *Crepidula plana*). These areas are protected and have lower energy inputs, allowing organic materials to settle out and provide a source of food to deposit feeders. Offshore, deeper areas of Buzzards Bay also have fine sediments and experience less wave energy. Deeper, offshore benthic communities are comprised of molluscs such as *Nassarius trivittatus* and *Yoldia limatula*.

Coarser-grained, sandy sediments in offshore locations have benthic communities characterized by suspension feeders, carnivores, herbivores, or nonselective deposit feeders such as *Nassarius trivittatus, Chaetopleura apiculata,* and *Anachis avara* (Howes and Goehringer 1996).

3.3.4 Shellfish

Buzzards Bay supports populations of bay scallop (*Aequipecten irradians*), quahog (*Mercenaria mercenaria*), ocean quahog (also called black clam; *Arctica islandica*), soft-shelled clams (*Mya arenaria*), oyster (*Crassostrea virginica*), surf clam (*Spisula solida*), and lobster (*Homarus americanus*). Figure 3.3 shows locations of shellfish beds in Buzzards Bay.



Quahog in Buzzards Bay can grow in shallow or deep water in sandy to muddy bottoms where they burrow into the sediment and extend their siphons to feed (Howes and Goehringer 1996). They are found along almost the entire shoreline periphery of Buzzards Bay and, along the northern shore, extending south out into deeper water in the center of the bay. Ocean quahog (*A. islandica*) are generally found in muddy sands of deeper waters offshore, in the central-southwest portion of Buzzards Bay (Howes and Goehringer 1996).

Soft-shell clams occur in sandy or muddy, organic-rich sediments in calm embayments and inlets and saltmarsh creeks. They also burrow in sediments and extend their siphons into the water column to feed (Howes and Goehringer 1996). Soft-shell clam beds are located primarily at the northeastern end of Buzzards Bay towards the entrance to the Cape Cod Canal.

Bay scallop adults are mobile and grow quickly with a short spawning season that can result in fluctuations in their populations in different locations. Bay scallops are more common in shallow embayments but can occur at depths from 15 to 39 feet (4.5 to 12 m). Juvenile scallops are sedentary and often attach to eelgrass beds, making the scallop population also susceptible to fluctuations in eelgrass habitat distributions (Howes and Goehringer 1996). Bay scallop beds are located at the northeastern end of Buzzards Bay towards the entrance to the Cape Cod Canal

Oysters are not as abundant as other bivalves in Buzzards Bay, but can be found along the bay's eastern shore. Oysters require hard substrates upon which to attach and grow and so are usually found on rocks and pilings (Howes and Goehringer 1996).

Although the lobster fishery is strong in some areas of Massachusetts, in Buzzards Bay, landings have declined by 50 percent since 1998 (MMFI 2012). In 2002, lobster landings in Buzzards Bay accounted for only 1.6 percent of the state total, but this still represented an annual retail value close to $817,000 and a valuable asset to local lobstermen (BBNEP 2012). Lobsters are found among rock or grass shelters during the day and emerge at dusk to feed on plants, bivalves, other lobsters, or fish. Smaller lobsters are found closer to shore while larger individuals are found in offshore water (Howes and Goehringer 1996).

3.3.5 Fisheries

3.3.5.1 Essential Fish Habitat

Buzzards Bay is home to a number of fish species and other marine life, including commercial and recreational species, bottom dwelling and free-swimming water column species and resident and migratory species (Carey and Haley 2002; Howes and Goehringer 1996). Buzzards Bay provides spawning, nursery and feeding habitat. Many of the fish in Buzzards Bay are migratory and move along the southeastern New England Atlantic coast and into the bay in spring and summer. Some species (e.g., bluefish, striped bass) continue their migration through the Cape Cod Canal into Cape Cod Bay. As a result, the nekton of Buzzards Bay are connected to a much larger population of fish and invertebrates. Marine habitat in Buzzards Bay provides EFH for the species listed in Table 3-1 at the indicated life stages. Habitats that are identified as EFH are protected under the Magnuson-Stevens Fishery Conservation and Management Act.

Table 3-1. Species and Applicable Life Stages for which EFH is Designated within Buzzards Bay

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod (*Gadus morhua*)	X	X	X	X
haddock *(Melanogrammus aeglefinus)*	X	X		
red hake *(Urophycis chuss)*		X	X	X
winter flounder *(Pseudopleuronectes americanus)*	X	X	X	X
windowpane flounder *(Scophthalmus aquosus)*	X	X	X	X

Species	Eggs	Larvae	Juveniles	Adults
American plaice *(Hippoglossoides platessoides)*			X	X
Atlantic sea herring *(Clupea harengus)*			X	X
bluefish *(Pomatomus saltatrix)*			X	X
long-finned squid *(Loligo pealei)*			X	X
short-finned squid (*Illex illecebrosus*)			X	X
Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralichthys dentatus)*	X	X	X	X
scup *(Stenotomus chrysops)*	X	X	X	X
black sea bass *(Centropristis striata)*	n/a	X	X	X
surf clam *(Spisula solidissima)*	n/a	n/a	X	X
king mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
cobia *(Rachycentron canadum)*	X	X	X	X
little skate (*Leucoraja erinacea*)			X	X
winter skate (*Leucoraja ocellata*)	X	X	X	X
sandbar shark *(Carcharinus plumbeus)*				X
bluefin tuna *(Thunnus thynnus)*			X	

3.3.5.2 Essential Fish Habitat Species

Atlantic cod (*Gadus morhua*) – Buzzards Bay is designated as EFH for all life stages of the Atlantic cod. In southern New England, Atlantic cod are common only in winter and spring in shallow waters less than 40 ft (12 m) deep, but are common year-round in deeper water. Eggs are common in winter and spring. Larvae are typically pelagic and occur in near-shore waters at depths of 98 to 230 ft (30 to 70 m) in the spring. Juveniles prefer bottom habitats at depths of 33 to 492 ft (10-150 m). Cod are observed spawning during fall, winter and early spring (NMFS/NERO 1998; Fahay et al. 1999).

Haddock (*Melanogrammus aeglefinus*) – Buzzards Bay is designated as EFH for the egg and larval stages of the haddock life cycle. Eggs occur between March and May at depths of 164 to 295 ft (50 to 90 m), while larvae are common between April and May at depths of 98-295 ft 30-90 m (NMFS/NERO 1998; Cargnelli et al. 1999b).

Red hake (*Urophycis chuss*) – Buzzards Bay is EFH for the larval, juvenile and adult life stages of the red hake. Larvae are pelagic, preferring water depths less than 656 ft (200 m) and are common during the months of September to October. Juveniles prefer bottom habitats and water depths less than 328 ft (100 m) and are present in spring and fall. Adults are found in bottom habitats at depths between 33 and 427 ft (10-130 m) and spawning takes place in June and July (NMFS/NERO 1998; Steimle et al. 1999c).

Winter flounder (*Pseudopleuronectes americanus*) – Buzzards Bay is designated as EFH for all life stages of winter flounder. Eggs are found in bottom habitats at depths less than 16 ft (5 m), while larvae inhabit open water and benthic habitats at depths less than 6 m (17 ft) and are most common in April and May. Juvenile and adults are found in bottom habitats near shore at depths less than 33 ft (10 m). Spawning occurs in February and March. Winter flounder undergo a seasonal inshore-offshore migration, and are more abundant in Buzzards Bay during spring and less abundant in summer and fall as they move offshore to cooler waters (NMFS/NERO 1998; Pereira et al.1999).

Windowpane flounder (*Scophthalmus aquosus*) – Buzzards Bay is designated as EFH for all life stages of windowpane flounder. Eggs are most abundant in July and August at depths less than 70 m (230 ft). Larvae are pelagic, occurring at water depths less than 230 ft (70 m) and most common in late

summer and fall. Juveniles and adults are benthic and found at depths from 3 to 328 ft (1to 100 m). Spawning occurs in spring, summer and fall (NMFS/NERO 1998; Chang et al. 1999).

American plaice (*Hippoglossoides platessoides*) – Buzzards Bay is designated as EFH for the juvenile and adult stages of the American plaice life cycle. Juveniles and adults are found in bottom habitat in water depth between 148 to 574 ft (45-175 m). Spawning occurs from March to June in shallow waters less than 90 m (295 ft) deep (NMFS/NERO 1998; Johnson et al. 1999).

Atlantic sea herring (*Clupea harengus*) – Buzzards Bay is designated as EFH for the juvenile and adult stages of the Atlantic sea herring life cycle. Juveniles and adults inhabit open and bottom habitats at depths between 49 to 427 ft (15to 130 m). Atlantic sea herring are more common in spring and fall in Buzzards Bay because they spawn outside of the bay from July to November (NMFS/NERO 1998; Reid et al. 1999).

Bluefish (*Pomatomus saltatrix*) – Buzzards Bay is designated as EFH for the juvenile and adult stages of the bluefish life cycle. Bluefish are migratory, appearing in Buzzards Bay from May to October, before returning to warmer waters. Juveniles prefer estuaries and shallow waters. Adults prefer near-shore open waters (NMFS/NERO 1998; Fahay et al. 1999).

Long-finned squid (*Loligo pealei*) – Buzzards Bay is designated as EFH for the juvenile and adult stages of the long-finned squid life cycle. Juveniles and adults are found in open water. Juveniles are found from shore to depths of 700 ft (213 m) while adults are found from shore to 1,000 ft (305 m) (NMFS/NERO 1998; Cargnelli et al. 1999).

Short-finned squid (*Illex illecebrosus*) - Buzzards Bay is designated as EFH for the juvenile and adult stages of the short-finned squid life cycle. Both juveniles and adults are pelagic and found from shore to depths of 600 ft (183 m) (NMFS/NERO 1998).

Atlantic butterfish (*Peprilus triacanthus*) – Buzzards Bay is designated as EFH for all four stages of the Atlantic butterfish life cycle. Eggs are found from brackish estuarine water to coastal embayments in depths from shore to 6,000 ft (1,829 m). Larvae inhabit open waters usually associated with floating vegetation and are most frequently observed in July and August. Juveniles inhabit open waters from 33 to 1,082 ft (10 to 33 m) in coastal bays and estuaries and are generally present from spring to fall (NMFS/NERO 1998; Cross et al. 1999).

Atlantic mackerel (*Scomber scombrus*) – Buzzards Bay is designated as EFH for all four stages of the Atlantic mackerel life cycle. Eggs are found nearshore and offshore at depths up to 50 ft (15 m). Larvae are found near and offshore at depths of 33 to 425 ft (10 to 130 m). Juveniles are found near and offshore at depths up to 1,500 ft (320 m) and tend to be most common from May to August. Adults are found near and offshore at depths up to 1,250 ft (381 m) and are found in greatest densities in late winter and early spring (NMFS/NERO 1998; Studholme et al. 1999).

Summer flounder (*Paralichthys dentatus*) – Buzzards Bay is designated as EFH for all four stages of the summer flounder life cycle. Summer flounder eggs are present from October to May at depths from 98 to 361 ft (30 to 110 m). Larvae are found generally offshore at depths of 33 to 230 ft (10-70 m) but migrate inshore to undergo metamorphosis. Larvae are most common from October to January. Juveniles prefer shallow (less than 4.9 ft [1.5 m]) waters in marsh creeks, tidal flats and channels. Adults are found in bottom habitats with submerged aquatic vegetation both inshore and offshore depending on water temperature (NMFS/NERO 1998; Packer et al. 1999).

Scup (*Stenotomus chrysops*) – Buzzards Bay is designated as EFH for all four stages of the scup life cycle. Scup are primarily bottom feeders and spawn in inshore regions in late spring. They are found in Buzzards Bay during summer and early fall, and migrate to deeper warmer waters in winter (Howes

and Goehringer 1996). Both eggs and larvae tend to be found in estuaries from May to August in southern New England. Juveniles are found in estuaries and bays with sandy, muddy bottoms and eelgrass beds. Adults are found in estuaries at depths of 7 to 125 ft (2-38 m) (NMFS/NERO 1998; Steimle, et al., 1999b).

Black sea bass (*Centropristis striata*) – Buzzards Bay is designated as EFH for the larvae, juvenile, and adult stages of the black sea bass life cycle. Larvae are found at depths less than 100 m (328 ft) in coastal areas. Juveniles are found in estuarine and coastal areas and near salt marsh areas at depths less than 125 ft (38 m). Adults black sea bass are typically present in estuarine waters inshore and most common from May to October (NMFS/NERO 1998; (Steimle et al. 1999a).

Surf clam (*Spisula solidissima*) – Buzzards Bay is designated as EFH for the juvenile, and adult stages of the surf clam life cycle. Both juvenile and adult surf clams are found in medium to fine-grained sands at depths from 26 to 216 ft (8 to 66 m). Adults spawn during summer (NMFS/NERO 1998; Cargnelli et al. 1999).

King mackerel (*Scomberomorus cavalla*) – Buzzards Bay is designated as EFH for all four stages of the king mackerel life cycle. The northern range of the king mackerel is southern Massachusetts and it is generally absent from Buzzards Bay and Cape Cod north (NMFS/NERO 1998).

Spanish mackerel (*Scomberomorus maculatus*) – Buzzards Bay is designated as EFH for all four stages of the Spanish mackerel life cycle. Although the northern range of this species is Cape Cod, Spanish mackerel are rarely reported north of the Chesapeake Bay (Robins and Ray 1986). They spawn off the coast from spring to summer (NMFS/NERO 1998).

Cobia (*Rachycentron canadum*) – Buzzards Bay is designated as EFH for all four stages of the cobia life cycle. Cobia are coastal pelagics and reach the northern part of their range in southern Massachusetts (Robins and Ray 1986). Cobia are generally absent from northern Massachusetts waters and points north of Cape Cod (NMFS/NERO 1998).

Little skate (*Leucoraja erinacea*) – Buzzards Bay is designated as EFH for the juvenile and adult stages of the little skate life cycle. The little skate is found in depths up to 295 ft (90 m) and is found inshore during the winter and spring and offshore during summer and fall. They prefer sand, pebbly or muddy bottoms (NMFS/NERO 1998).

Winter skate (*Leucoraja ocellata*) – Buzzards Bay is designated as EFH for all four stages of the winter skate life cycle. Winter skate is found on sandy and gravelly bottoms up to 36 ft (11 m) in depth (NMFS/NERO 1998).

Sandbar shark (*Carcharinus plumbeus*) – Buzzards Bay is designated as EFH for the adult sandbar shark. Adult sandbar shark are found in shallow, muddy coastal waters up to 165 ft (50 m) in depth. This species migrates south to warmer waters in winter. Southern New England is the northern limit of the sandbar shark's range and is not likely that it is abundant in Buzzards Bay (NMFS/NERO 1998).

Bluefin tuna (*Thunnus thynnus*) - Buzzards Bay is designated as EFH for the juvenile bluefin tuna. Juvenile bluefin tuna are found in all coastal pelagic waters from 82 to 656 ft (25-200 m) in depth (NMFS/NERO 1998).

3.3.6 Birds

Buzzards Bay provides important foraging and nesting habitats, including open water, embayments, beaches, eelgrass beds, and salt marshes, for numerous migratory and resident birds. Several species nest and forage within saltmarshes and along rocky or sandy beaches. Small, rocky

islands within Buzzards Bay serve as nesting grounds for several species. Open water and eelgrass beds are important habitats for bird prey species including invertebrates and fish.

3.3.7 Protected Species

3.3.7.1 Federally Listed Threatened and Endangered Species

A list of federal threatened and endangered species that potentially occur in Buzzards Bay and the Cape Cod Canal and their status is provided in Table 3-2. The table includes species listed by the USFWS and the NMFS. The species are discussed in more detail following the table.

Table 3-2. Federal and State Listed Threatened and Endangered Species with the Potential to Occur in the Project Area

Common Name	Scientific Name	Federal Status*	State Status****	Agency Regulatory Authority
Reptiles				
Loggerhead Sea Turtle	*Caretta caretta*	T	ST	NMFS
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E	SE	NMFS
Leatherback Sea Turtle	*Dermochelys coriacea*	E	SE	NMFS
Green Sea Turtle	*Chelonia mydas*	T	ST	NMFS
Diamond-backed Terrapin	*Malaclemys terrapin*		ST	MDFW
Birds				
Pied-Billed Grebe	*Podilymbus podiceps*		SE	MDFW
American Bittern	*Botaurus lentiginosus*		SE	MDFW
Least Bittern	*Ixobrychus exilis*		SE	MDFW
Bald Eagle	*Haliaeetus leucocephalus*	**	SE	MDFW
King Rail	*Rallus elegans*		ST	MDFW
Common Moorhen	*Gallinula chloropus*		SC	MDFW
Piping Plover	*Charadrius melodus*	T	ST	USFWS
Roseate Tern	*Sterna dougallii*	E	SE	MDFW, USFWS
Common Tern	*Sterna hirundo*		SC	MDFW
Arctic Tern	*Sterna paradisaea*		SC	MDFW
Least Tern	*Sternula antillarum*	E***	SC	MDFW, USFWS
Red knot	*Calidris canutus rufa*	C		USFWS

Common Name	Scientific Name	Federal Status*	State Status****	Agency Regulatory Authority
Mammals				
North Atlantic Right Whale	*Eubalaena glacialis*	E	SE	NMFS

Notes:

***Federal Designations:**

E - Federal Listed Endangered; T - Federal Listed Threatened: C - Candidate

**Bald eagle is delisted. Nesting bald eagles and their nests are protected by law under the Bald and Golden Eagle Act.

***Interior U.S. population only.

****State Designations:**

***Massachusetts Division of Fisheries and Wildlife

SE - State Listed Endangered

ST - State Listed Threatened.

SC - State Listed Special Concern

Sources: USFWS 2012; NOAA/NMFS 2011; MDMF 2008.

Bald eagle (*Haliaeetus leucocephalus*) – The bald eagle is listed as endangered in Massachusetts, but delisted under the ESA; however, nesting bald eagles and their nests are protected under the Bald and Golden Eagle Act. Bald eagle nests have been recorded in Plymouth County, which borders Buzzards Bay to the north, and bald eagles overwinter along the Buzzards Bay coastline (MDFW 2008).

Piping plover (*Charadrius melodus*) – The piping plover nests on sandy coastal beaches and dunes, between the high tide line and the foot of coastal dunes of all counties bordering Buzzards Bay (MDFW 2009). They feed on marine invertebrates found along the rack line and tidal flats at low tide.

Roseate tern (*Sterna dougallii*) – The roseate tern nests in colonies on sandy or rocky islands and occasionally on barrier beaches in dense vegetation among rocks and boulders. They forage for small fish and crustaceans over sandbars, inlets and shoals and can forage up to 19 miles (30 km) from the breeding colony. Approximately 60 percent of the northeast population of roseate terns is located in just two colonies found in Buzzards Bay (MDFW 2012).

Loggerhead sea turtle (*Caretta caretta*) – Loggerhead sea turtles, especially pelagic juveniles, forage on vegetation and invertebrates in nearshore coastal areas and estuaries (NOAA/NMFS 2011). Loggerhead sea turtles are occasionally sighted or found stranded in the bay every year, but do not nest in Buzzards Bay (NMFS 2011).

Kemp's ridley sea turtle (*Lepidochelys kempii*) – The Kemp's ridley turtles is the most critically endangered sea turtle species. They are found in shallow coastal waters and sea grass beds as well as open ocean, usually in the Gulf of Mexico, but juveniles do occur during the summer off the coast of Massachusetts. Juvenile Kemp's ridleys are occasionally seen foraging in Buzzards Bay (Morreale and Standora 1989; Buzzards Bay Project National Estuary Program 1991). Kemp's ridley sea turtles do not nest in Buzzards Bay.

Leatherback sea turtle (*Dermochelys coriacea*) – Leatherback sea turtles nest in the tropics and move north to forage. They are occasionally sighted and stranded in Buzzards Bay (Shoop and Kenney 1992; Buzzards Bay National Estuary Program 1991). In August 2008, more than 100 sightings of leatherback sea turtles were reported in southeast Massachusetts. Leatherback sea turtles do not nest in Buzzards Bay.

Green sea turtle (*Chelonia mydas*) – Green sea turtles are herbivorous and forage in shallow coastal areas. Their range extends into the coastal waters of Massachusetts (NMFS 2011); however, they are considered an 'oceanic straggler in southern New England' by the USFWS (USFWS 2012). In comparison to other sea turtle species, there have been minimal recordings of the green sea turtle as far north as Cape Cod. Green turtles have the potential to occur, but do not nest in Buzzards Bay.

Red knot (*Calidris canutus rufa*) – The red knot is currently a candidate to be listed as a federal threatened and endangered species. The *rufa* population of red knot is a shorebird that breeds in the central Canadian Arctic and migrates primarily along the Atlantic coast of North America (USFWS 2007). Buzzards Bay is an important migration stopover location where red knot forage on sandy beaches, tidal mudflats, salt marshes, and peat banks for bivalves, gastropods, and crustaceans (USFWS 2007).

North Atlantic right whale (*Eubaleena glacialis*) – Rare sightings (one sighting reported in 2008 and one in 2012) of the federally endangered North Atlantic right whale occur in Buzzards Bay and the Cape Cod Canal. When sightings are reported, the USCG restricts boat traffic and escorts the whales until they leave the area (Bragg 2012).

3.3.7.2 State Listed Threatened, Endangered, and Special Concern Species

Each state maintains a list of species that are of concern within that state. These lists generally include species on the federal list as well as species that are considered endangered or threatened only at the state level. In addition to the federally listed species, Massachusetts includes the following species that occur in Buzzards Bay on the state list of endangered, threatened or special concern species: pied-billed grebe, American bittern, least bittern, king rail, common moorhen, common tern, arctic tern, least tern, and diamond-backed terrapin.

3.3.8 Migratory Birds

Buzzards Bay encompasses estuarine, saltmarsh, and beach habitats that are important areas for some migratory bird species protected under the MBTA. Species covered under the MBTA that occur in Buzzards Bay are: red-throated loon, common loon, pied-billed grebe, horned grebe, red-necked grebe, double-crested cormorant, American bittern, least bittern, great blue heron, great egret, snowy egret, little blue heron, tricolored heron, green heron, black-crowned night-heron, yellow-crowned night-heron, glossy ibis, brant, Canada goose, green-winged teal, American black duck, mallard, blue-winged teal, northern shoveler, American widgeon, canvasback, redhead, ring-necked duck, greater scaup, lesser scaup, common eider, king eider, harlequin duck, long-tailed duck, black scoter, surf scoter, white-winged scoter, common goldeneye, Barrow's goldeneye, bufflehead, hooded merganser, common merganser, red-breasted merganser, ruddy duck, black rail, clapper rail, king rail, Virginia rail, sora, American coot, American oystercatcher, greater yellowlegs, willet, spotted sandpiper, ruddy turnstone, red knot, sanderling, purple sandpiper, dunlin, killdeer, laughing gull, black-headed gull, Bonaparte's gull, ring-billed gull, herring gull, Iceland gull, lesser black-backed gull, glaucous gull, great black-backed gull, black skimmer, belted kingfisher, American crow, salt marsh sharp-tailed sparrow, Nelson's sharp-tailed sparrow, and seaside sparrow.

3.4 Socioeconomics

3.4.1 Definition of the Resource

This section focuses on the demographic and socioeconomic characteristics of coastal populations and municipalities that surround Buzzards Bay.

3.4.2 Affected Environment

3.4.2.1 Population

Four Massachusetts counties encompassing 11 towns surround the bay on the east, west and north. Municipal boundaries are shown on Figure 1-1 in Section 1.3. Table 3-3 lists Massachusetts counties and towns that border the bay along with their 2009 year-round residential populations.

Table 3-3. Counties and Towns Bordering Buzzards Bay

County/Town or City	2009 Population
Barnstable County	
Bourne	19,387
Falmouth	32,817
Bristol County	
Dartmouth	4,421
Fairhaven	16,097
New Bedford	91,053
Westport	15,529
Dukes County	
Gosnold	86
Plymouth County	
Marion	5,182
Mattapoisett	6,519
Plymouth	56,842
Wareham	21,348

Source: US Census Bureau, 2012.

In addition to the year-round residential population of the municipalities identified in Table 3-3, each also experiences a substantial increase in seasonal and day visitors during the summer months. For example, in 2004, the town of Bourne in Barnstable County had a year-round population of 19,516 and an estimated seasonal population of 40,000 (Bourne. 2009). Although seasonal population estimates are not available for all of the towns bordering Buzzards Bay, the size of the seasonal/recreational population compared to the permanent year-round population can be estimated based on the number of seasonal/recreational housing units in each town. Table 3-4 lists seasonal housing as a percentage of the total housing units in each town/city. As noted in the table, with the exception of the City of New Bedford, seasonal/recreational use housing represents more than 50 percent of housing in all of the towns bordering Buzzards Bay, and eight of the eleven towns bordering Buzzards Bay contain over 70 percent seasonal/recreational use housing.

Table 3-4. Seasonal Housing as a Percentage of Total Housing Units

County/Town or City	Total Housing Units	Percent Seasonal / Recreation / Occasional Use
Barnstable County		
Bourne	10,805	75.6%
Falmouth	21,970	89.9%
Bristol County		
Dartmouth	12,435	55.1%
Fairhaven	7,475	58.8%
New Bedford	42,933	2.8%
Westport	7,193	74.7%
Dukes County		
Gosnold	215	98.9%
Plymouth County		
Marion	2,445	78.5%
Mattapoisett	3.262	84.0%
Plymouth	24,800	71.2%
Wareham	12,256	74.6%

Source: UMass Donahue Institute. 2012.

3.4.2.2 Recreation

The Buzzards Bay coastline stretches over 350 miles (563 km) including inner harbors, bayward facing portions of the Elizabeth Islands, and the Cape Cod Canal. The bay and its shoreline provide a haven for tourism and recreation to both day users and longer-term visitors. The visitors support local businesses and the local economy by purchasing goods and services during their visits. The economic impact of tourism on Buzzards Bay counties is substantial.

Approximately 13.4 miles of public beaches (municipal and state owned) and 31.9 miles of "semi-public" beaches are located on Buzzards Bay (BBNEP 2011a). The balance of the shoreline is privately owned. Beaches owned by cities, towns, and the state are open to any member of the public. However, beach parking stickers are required to park at municipal beach parking lots, generally with different rates for residents and non-residents. Demerest Lloyd State Park and Horseneck Beach State Reservation each charge a single rate for parking. Table 3-5 lists beaches that are located on the bay. In addition to bay beaches, USACE maintains 10 recreation areas along the Cape Cod Canal that include a variety of recreation amenities including picnic areas, playgrounds, camping facilities, trails and scenic overlooks of the canal (USACE. 2012a).

Table 3-5. Beaches Located on Buzzards Bay

Town / Beach	*Town* / Beach	*Town* / Beach
Bourne	***Falmouth***	***New Bedford***
Barlows Landing Beach	Black Beach	Clarks Cove
Bennets Neck Beaches	Bristol Beach	Davey's Locker Beach
Electric Avenue Beach	Cape Codder Hotel Beach	East Beach
Eustis Beach	Chapaquoit Beach	J. Beach
Gray Gables Beach	Hamlins Point Bach	Kid's Beach
Hen Cove North	Magansett Beach	South 400 Beach
Hen Cove West	Menauhant Beach	South Pier Beach
Mashnee Island Beach	Mill Road Beach	Squid Beach
Merriam Beach	Old Silver Beach	Taber Beach
Monument Beach	Racing Beach	Tower Beach
Patuissett Beach	Saconessett Hills Beach	Turtle Park Beach
Phinneys Harbor Beach	Stoney Beach	West Beach
Phinneys Point Beach	Surf Drive Beach	***Wareham***
Sagamore Beach	The Knob	Briarwod Beach
Scenic Park Beach	Wood Neck Beach	Hamilton Beach
Squeteaque Harbor Beach	Wood Neck River	Independence Point Beach
Dartmouth	***Marion***	Indian Heights Beach
Anthony's Beach	Dexter Beach	Little Harbor Beach
Apponagansett Town Beach	Hammer's Cove Beach	Minot Forest Beach
Barney's Joy Beach	Island Wharf Beach	Onset Beach
Bay View Beach	Piney Point Beach Club	Parkwood Beach
Demarest Lloyd State Beach	Planting Island Beach	Pinehurst Beach
Hidden Bay Beach	Silver Shell Beach	Riverside Beach
Jone's Park Town Beach	Tabor Academy Beach	Sandlewood Beach
Little River Beach	Town Beach	Shangrila Beach
Mishaum Point Beach	***Mattapoisett***	Shell Point Beach
Moses Smith Creek Beach	Antassawomack Beach	Sunset Beach
Nonquitt	Aucoot Beach	Swifts Neck Beach
Round Hill Town Beach	Brant Beach	**Westport**
Round Hill Community Beach	Crescent Beach	East Beach
Salter's Point Beach	Harbor Beach	Goosberry Neck Beach
Shore Acres Beach	Hollywoods Beach	Horseneck Beach
Fairhaven	Leisure Shores Beach	Horseneck Point Beach Club
Causeway Road Beach	Mattapoisett Shores Beach	Town Beach
Fort Phoenix State Beach	Nasketucket Reservation Beach	Cherry and Webb Beach
Fort Phoenix Town Beach	Ned's Point Beach	Knubble Rock Beach Club
Knollmere Beach	Peases Point Beach	Spindle Rock Beach Club
Popes Beach	Point Connett Beach	
Sunrise Beach	Town Beach	
West Island Causeway Beach		
West Island Town Beach		

Sources: www. Buzzards bay.org/images/beaches.gif
Massachusetts Department of Public Health. 2002.

In addition to beaches, numerous public marinas and yacht clubs are located throughout Buzzards Bay that provide slips and moorings to residents as well as to recreational boaters needing an overnight mooring as they transit through the area. More than 12,000 boats can be found on Buzzards Bay during peak summertime holidays (BBNEP 2011a).

Sailboat races are held in the bay each summer by Buzzards Bay yacht and sailing clubs. The largest of the races is the Buzzards Bay Regatta. Initially held in 1972, today the Buzzards Bay Regatta is the largest multi-class regatta in the United States with more than 450 boats and 1200 sailors across 15 different classes. In addition to the sailors, 30 committee chairs are joined by over 200 volunteers during regatta weekend. (Buzzards Bay Regatta. 2012).

Other events that draw tourists to the area include annual town festivals that focus on the waterfront, such as the New Bedford Working Waterfront Festival and the Bourne Scallop Festival. These events attract visitors from throughout the region.

Recreational fishing in Buzzards Bay provides another source of income to area towns and businesses. Recreational fishermen include shore-based recreational anglers and shellfish gatherers' vessel-based anglers, lobster and fish potters, shellfish gatherers, and participants in charter boat excursions. Recreational fishing is primarily focused in the shallow waters of Buzzards' Bay. Fishing trips often last from several days to a week or more and anglers generally stay in local hotels and use local amenities including bait and tackle shops, local restaurants and other tourist attractions. (Colburn, L., et al. 2002.)

In excess of 25,000 motor vessels are estimated to be moored in the bay with an additional 10,000 to 15,000 trailered in annually, a substantial number of which are used for recreational fishing. The number of people who use the bay for recreational fishing is hard to estimate since licensing is not required for saltwater recreational fishing in Massachusetts. Assuming two to three anglers per boat, as many as 50,000 to 75,000 individuals may use Buzzards Bay annually for recreational fishing. (Colburn, L., D.A. Carey and N. Haley 2002.)

Although licenses are not required for saltwater fishing in Massachusetts, licenses are required for recreational and commercial shellfishing. Shellfish licenses are issued by each municipality for areas within the town's boundaries. More than 12,800 recreational permits are issued annually (BBNEP 2012). Most shellfishing occurs close to shore, particularly in the harbors. Figure 3-3 shows the locations of shellfish beds in Buzzards Bay.

3.4.2.3 Employment and Economy

Tourism is the largest source of business revenue in the Buzzards Bay region (Falmouth 2005), and the most important industry in southeastern Massachusetts (BBNEP 2011a). Table 3-6 identifies the impact of domestic travel on Southeastern Massachusetts.

Table 3-6. 2004 Domestic Travel Impact on Southeastern Massachusetts

County	Expenditures ($ Millions)	Payroll ($ Millions)	Employment (Thousands)	State Tax Receipts ($ Millions)	Local Tax Receipts ($ Millions)
Barnstable	$745.61	$207.92	9.28	$32.54	$43.12
Bristol	$311.64	$71.93	3.00	$17.24	$5.88
Plymouth	$384.19	$87.60	3.65	$19.44	$17.05
Subtotal	$1441.44	$367.45	15.93	$69.22	$66.05
State totals	$10,975.45	$2,845.83	110.47	$451.59	$268.50

Source: BBNEP 2011a.

Buzzards Bay beaches are the focus of much of the tourist and recreational interest. Table 3-7 lists employment by industry sector in each town bordering Buzzards Bay and the Cape Cod Canal.

Table 3-7. 2010 Average Monthly Employment by Industry

AICS Code	Employment Sector	Bourne	Dartmouth	Fairhaven	Falmouth	Gosnold	Marion	Mattapoisett	New Bedford	Plymouth	Wareham	Westport	Wrentham
	Total all industries	77,273	15,446	6,119	14,151	41	2,126	1,649	35,815	22,697	8,557	3,346	6,177
11	**Agriculture, Forestry, Fishing & Hunting**	52	NA	141	25	NA	NA	NA	1,098	25	157	102	NA
1141	Fishing	NA	NA	138	0	NA	0	0	1,091	0	0	25	NA
23	**Construction**	422	466	258	575	NA	494	71	788	885	148	590	231
31-33	**Manufacturing**	335	886	848	490	NA	407	87	6,590	1,184	602	119	330
22	**Utilities**	36	NA	NA	NA	NA	0	0	315	862	39	0	0
42	**Wholesale Trade**	520	527	141	270	NA	40	168	1,588	286	245	154	110
44-45	**Retail Trade**	893	3,890	1,182	1,920	NA	112	128	2,892	3,614	2,184	419	2,264
51	**Information**	240	88	144	182	NA	11	0	477	464	113	NA	33
52	**Finance and Insurance**	101	187	192	251	NA	56	38	809	559	99	84	40
53	**Real Estate & Rental & Leasing**	100	103	12	103	NA	9	40	360	183	64	23	7
531	Real Estate	74	84	NA	65	NA	9	24	266	116	40	9	NA
532	Rental & Leasing Services	24	19	NA	37	NA	NA	NA	94	67	24	NA	NA
54, 56	**Professional & Technical Services**	699	582	287	2,330	NA	192	97	2,681	1,754	648	204	495
61, 62	**Education & Health Services**	1,846	5,049	1,525	3,807	NA	729	400	2,727	4,912	1,872	454	1,600
71, 72	**Leisure & Hospitality**	1,090	2,324	937	2,304	NA	301	350	2,713	3,641	1,172	511	706
71	Arts, Entertainment, & Recreation	195	350	44	413	NA	162	118	350	759	85	76	NA
72	Accommodation & Food Services	896	1,975	769	1,891	NA	139	232	2,363	2,882	1,087	436	697
81	**Other Services**	301	645	293	508	NA	88	162	2,157	798	423	222	108
92	**Public Administration**	638	594	171	1,385	NA	NA	NA	1,975	1,689	382	NA	135

Notes:
Subsets of major labor categories are indented.
NA = Not available or none
Source: Massachusetts Department of Labor 2012.

As noted in Table 3-7, with the exception of the City of New Bedford, a large percentage of employment in each of the Buzzards Bay towns is in the hospitality and retail trade sectors, which provide services to both local residents as well as the thousands of people that visit the area each year. In particular, excluding New Bedford, the Leisure and Hospitality sector provides approximately one third of all employment opportunities in Buzzards Bay communities.

Gillnetting, trawling, purse seining and haul seining for finfish, as well as the use of mobile gear (otter and beam trawls, scallop dredges, bottom pair trawls, Scottish/Danish seines and pair seines) has been prohibited in Buzzards Bay since the late 1800's. Small mesh nets for shrimp are also prohibited. Hook and line is allowed with some seasonal restrictions depending on fish species. (MDMF 2002). Although the Port of New Bedford generates more than $1 billion annually in economic activity associated with the fishing industry (Port of New Bedford 2012), the fishing fleet that sails out of New Bedford depends for the most part on deeper and colder waters outside of the bay for its catch.

Buzzards Bay contains shellfish resources that support an approximately $4 million shellfish industry and represents about 25 percent of Massachusetts' total shellfish industry. Species caught in the bay include soft-shelled clams, quahogs, scallops, oysters, and lobster. More than 500 commercial permits are sold annually by Buzzards Bay communities (BBNEP 2012). Most shellfishing occurs close to shore, particularly in the harbors. Figure 3-3 shows the location of shellfish beds in Buzzards Bay.

3.4.2.4 Commercial Shipping

Buzzards Bay is part of the Atlantic Intracoastal Waterway system and is connected to Cape Cod Bay by the Cape Cod Canal. Use of the Cape Cod Canal saves mariners an average of 135 miles of coastwise travel that would otherwise be required to circumnavigate around Cape Cod. Vessels up to 825 feet in length can use the canal. The Canal has an authorized depth of 32 feet at mean low water (MLW).

Commercial shipping occurs in Buzzards Bay both to access the port of New Bedford, as well as to access ports north and south of the bay via the Cape Cod Canal. In 2002 there were approximately 10,000 commercial vessel transits and more than 1,200 tank barge transits in Buzzards Bay (USCG 2007a). In 2007, 1,049 non-self-propelled tanker barges carried liquids through the Cape Cod Canal (USACE 2012c), which included a monthly average of approximately 540,000 tons of petroleum (USACE 2012c). Navigation and traffic within Buzzards Bay and the Cape Cod Canal are discussed in Section 3.2.

4 ENVIRONMENTAL CONSEQUENCES

This section describes the potential impacts and consequences, beneficial and adverse, of implementation of each of the alternatives.

According to MDEP, ninety-eight percent of the threat of exposure to an oil spill in Buzzards Bay is attributed to the number of vessels and the volume of oil transiting Buzzards Bay and the Cape Cod Canal (MDEP 2009). In 2005, 1,189 cargo vessels passed through the Cape Cod Canal. Among those vessels were tankers and tank barges that transported 8,534 short tons or roughly 2.1 billion gallons of petroleum products, equaling 78 percent of the total commodity tonnage passing through the canal. During that same year, vessels transported 235 tons or 75 million gallons of petroleum products in and out of the Port of New Bedford. (BBNEP 2011a.)

The main objective of this EA is to analyze and compare alternatives that could be applied to minimize the risk to Buzzards Bay from oil spills and to provide a tool to aid the USCG in making an informed decision on which alternative provides appropriate protection when balance with other pertinent issues that must be considered. Table 4-1 lists past oil spills in Buzzards Bay.

Table 4-1. Past Oil Spills in Buzzards Bay

Date	Location	Type	Volume (gallons)	Comments
1940s	Western Buzzards Bay, Westport (at Hen and Chicks?)	No. 2 Fuel Oil	unknown	
1963	Near Nyes Neck, North Falmouth	No. 2 Fuel Oil	unknown	
16-Sep-69	Fassets Point, West Falmouth	No. 2 Fuel Oil	189,000	***Florida*** Fuel Barge grounded. Final estimate was 4,500 barrels spilled.
9-Oct-74	Cleveland Ledge (near canal entrance)	No. 2 Fuel Oil	11,000 to 37,000	***Bouchard 65*** barge grounded. Oil came ashore in North Falmouth and Bourne.
28-Jan-77	Cleveland Ledge	No. 2 Fuel Oil	81,144	***Bouchard 65*** barge grounded. oil on iced-over bay, some burned. Final estimate was 1,932
10-Jun-90	Cleveland Ledge	No. 6 Fuel Oil	7,500	***Bermuda Star*** cruise ship grounded
18-Jun-90	Cleveland Ledge	Diesel Oil	100 or 200	***Bouchard 145*** fuel barge grounded.
7-Aug-92	Sow and Pigs Reef, Cutty- hunk	No. 6 Fuel Oil	50	***Queen Elizabeth II*** cruise ship grounded. Residual from empty fuel tank that was ruptured.
27-Apr-03	Rock reef west of green can #1 BB entrance, Westport	No. 6 Fuel Oil	98,000 (best estimate final)	***Bouchard No. 120*** fuel barge struck rocks.
Smaller spills of gasoline and fuel oil have occurred every few years in Buzzards Bay or in the Cape Cod Canal.				

Source: BBNEP 2011b.

Impacts were evaluated in terms of context (local or regional), type (adverse or beneficial), duration (short- or long-term), and intensity.

- Short-term impacts are those that occur only for a limited time period and are not recurring. Long-term impacts are those that occur frequently and are ongoing.

- Direct impacts are those that occur as a direct result of implementation of an alternative and occur at the same time and place of the action. Indirect impacts may be a secondary occurrence as a result of a direct impact. They occur later or are farther removed in distance, but are still foreseeable and related to the action by a chain of cause and effect.
- Adverse impacts cause negative or unfavorable outcomes on resources. Beneficial impacts have positive effects.
- Intensity indicates the potential severity of the impact. Definitions of intensity vary between the resources being evaluated and are provided at the beginning of each of the following resource impact sections.

4.1 Navigation and Vessel Movement

4.1.1 Significance Criteria

This section describes the qualitative criteria used to determine the impacts, both adverse and beneficial, of each alternative on the Buzzards Bay navigational environment.

The three types of marine incidents that most commonly cause major oil spills are considered in this analysis: collisions, allisions, and groundings. The most common cause of marine incidents is human error. The requirements of each alternative have been analyzed and compared to determine how they affect the probability of a marine incident involving a tank barge carrying 5,000 to 6,000 barrels of oil, and the potential for a marine incident to result in an oil spill or other hazardous substance release. The efficiency at which commercial barges are able to safely navigate and transit the bay was also reviewed for each alternative. For this analysis, potential impacts are defined as:

- ***Negligible*** – if the action would have no noticeable effects, beneficial or adverse, over pre-2007 RNA conditions.
- ***Minor*** – if the impact would provide some limited reduction in probability, but no real measurable change.
- ***Substantial*** – if the action would have noticeable or measurable beneficial or adverse impacts that would change the probability of an incident occurring when compared to pre-2007 RNA conditions.

4.1.2 Potential Impacts

4.1.2.1 Alternative 1 (No Action)

Alternative 1 represents the baseline conditions described in Section 3. The USCG determined through risk assessments and a PAWSA that even with these (pre-2007) baseline conditions, the risk for oil or hazardous material discharge was still relatively high. The PAWSA included recommended changes to the baseline RNA in order to further reduce the potential for such releases. Maintaining the baseline alone (Alternative 1) would not change the probability of a future incident occurring.

4.1.2.2 Alternative 2

Alternative 2 would have a minor to substantial beneficial impact in lowering the probability of a marine incident which could result in a future oil spill in Buzzards Bay through three of its requirements: 1) the requirement for a state-licensed pilot if the tank barge is unaccompanied by a tugboat escort; 2) the requirement for a dedicated lookout on the towing vessel; and 3) the requirement for an escort tug for both single and double hull tank vessels. Under Alternative 2, pilots directing oil-carrying barges through

Buzzards Bay must have a state license. A state licensed nautical pilot would safeguard against allisions and groundings, and ensure a safer and more efficient transit through the bay. The pilot provisions apply only to an oil-carrying barge attempting to enter Buzzards Bay unaccompanied by a tug escort, which reduces and limits the potential benefit of this requirement slightly.

The protections added by the state pilot licensure requirement, and the dedicated lookout manning requirement for single hull oil-carrying barges increase the probability that a potential marine incident would be detected early and avoided. However, the pilot is not required to be on the primary towing vessel and the dedicated lookout manning requirement does not apply to oil-carrying barges with a double hull, so its impact is limited and constantly declining as single hull vessels are phased out.

This alternative requires tug escorts for both single and double hull barges. The escort tug requirement for single and double hull barges would reduce the potential for a collision in the event of a loss of positive control by the primary tug. Thus the requirement for an escort tug can substantially reduce the potential for a collision incident, which could result in a product release to the Bay environment, especially if a single hulled tank vessel is the one in jeopardy. As noted in table 4-1, past oil spills in Buzzards Bay for which detailed information is available have all resulted from vessel groundings. While the potential for the release of oil or other hazardous material is high for single hull vessels in the case of grounding, double hull vessels are designed to provide greater protection in such instances. Therefore, requiring an escort tug to accompany a double hull tank vessel would result in only a minor additional reduction in the potential for an incident related release of product, when compared to the same requirement for single hull tank vessels.

Alternative 2 would mandate the use of USCG recommended routes and includes an option that a vessel may deviate from the mandated route if circumstances make it necessary to avoid a navigation hazard. This could be helpful in preventing an incident. However, mandating the unconditional use of recommended vessel routes would not have a beneficial impact due to the potential to put mariners at higher risk by requiring them to follow a set route when conditions warrant an alternative approach. Currently, most if not all mariners currently follow the recommended routes without them being mandatory (Federal Register 2007).

The vessel traffic system, if implemented, would have a substantial benefit because it would require continuous communications between the barge and the VTS. In the event of a navigational hazard, the constant communication with the VTS would facilitate the initiation of corrective action without the risk of a communications lapse. Though proposed, the VTS has not yet been developed and implemented.

In conclusion, Alternative 2 would have a substantial long-term beneficial impact on the Buzzards Bay maritime environment, as it would reduce the probability of a future oil spill incident through its positive control and single hull barge manning requirements. Although the communications requirement under this alternative is beneficial in theory, the VTS system has not been developed and therefore would not provide any immediate reduction in risk. Alternative 2 could also potentially have a minor beneficial impact from the mandated use of commercial vessel routes, as long as mariners are permitted to abandon the route to avoid navigational hazards.

4.1.2.3 Alternatives 3a and 3b

Alternatives 3a (the 2007 Final Rule) and 3b would have a substantial advantageous impact on the Buzzards Bay maritime environment through their communications requirement (VMRS) and positive control (escort tug and pilot) requirements.

Both 3a and 3b would require mandatory participation in a system that would track all commercial vessels through Buzzards Bay and the Cape Cod Canal and require barge operators to make their location and intentions known so that other mariners can use this advance information to avoid collisions.

This system would substantially improve navigational and situational awareness for all commercial vessels, and likely result in a measureable decrease in the potential for collisions by facilitating safer and more efficient transits through the bay.

The primary difference between Alternatives 3a and 3b is that 3a would only require escort tugs for single hull tank barges; Alternative 3b includes the requirement for both single and double hull barges. The USCG 2007 Final Rule's positive control requirements (Alternative 3a) will no longer be relevant after single hull vessels are completely phased out by the end of 2014. The phase-out continuously decreases the number of oil-carrying barges that must follow the final rule's positive control mandates.[1] However, because its communications requirements apply to all vessels towing a tank barge, Alternative 3a would continue to create a safer navigational environment through its VMRS requirements after 2014. Alternative 3b would continue to require a tug escort for oil carrying barges with a double hull, but would have no pilot mandates after 2014, as its pilot requirements apply to single hull barges only.

In conclusion, Alternatives 3a and 3b would have a substantial advantageous impact on the Buzzards Bay maritime environment and the reduction in the risk of a release of hazardous material as a result of the VMRS provisions and positive control provisions, especially as they apply to single hull barges.

4.1.2.4 Alternative 4

Alternative 4 combines the USCG 2007 Final Rule requirements and applies to single and double hull barges carrying a minimum of 5,000 barrels of oil or hazardous substances, regardless of propulsion. Alternative 4 adds the requirement for a federal pilot to double hull barges.

Alternative 4 would have short and long-term, substantial, beneficial impacts on the Buzzards Bay navigational environment when compared to Alternative 1. This alternative provides permanent safeguards to protect against human error as its escort tug and marine pilot requirements apply to both single and double hull barges, regardless of the primary towing vessel's propulsion system. Like Alternatives 3a and 3b, Alternative 4 also provides increased navigational and situational awareness as a benefit of the VMRS requirement. As the positive control requirements applying to single hull barges become obsolete following the final phase-out year 2014, Alternative 4 will still have beneficial impacts as it would continue to require escort tugs and pilots for double hull, oil-carrying barges. As noted in 2.1.2.2, however, past oil spills in Buzzards Bay for which detailed information is available have all resulted from vessel groundings. While the potential for the release of oil or other hazardous material is high for single hull vessels in the case of grounding, double hull vessels are designed to provide greater protection in such instances. As a result, the decrease in potential for an incident related release of product through the use of escort tugs for double hull tank vessels is minor when compared with single hull tank vessels.

[1] In the year 2000, the U.S. built oil transportation fleet was made up of 194 vessels, 144 single and 50 double hull. By 2006, approximately 60 percent of the fleet of 144 single hull tank vessels had been phased out under the deadlines established in the Oil Spill Pollution Act of 1990, leaving only about 60 single hull vessels in the U.S. fleet. By 2011, 90 percent of the single hull tank ships and barges were phased-out of service, leaving approximately 15 single hull oil-carrying vessels in operation in the U.S. (USGAO 2000).

4.1.2.5 Alternative 5

Alternative 5 is the same as Alternatives 3a and 3b except it requires only barges carrying 5,000 barrels or more of petroleum to participate in VMRS. When compared to no action (Alternative 1), this requirement (though it requires participation from a smaller number of barges than that described in Alternatives 3a, 3b, and 4) would still increase navigational and situational awareness enough to potentially result in a substantial reduction in collisions and more efficient vessel movement through the bay.

4.2 Biological Resources

This section presents the general impacts that could occur as the result of an oil spill as well as the specific impacts that could occur as the result of implementing any of the alternatives being considered in this EA: the relative likelihood of a release is discussed in section 4.1. Since the impacts of an oil spill would be identical under any of the alternatives, those impacts are presented first and are applicable to each of the action alternatives. Specific impacts of each alternative, which focus on the effects of the actions that would be implemented if the alternative was enacted into law, are discussed following the oil spill impact discussion.

4.2.1 Significance Criteria

In this section, the intensity of impacts is defined as follows:

- ***Minor*** - Minor impacts have limited effect and would produce no measureable change from pre-2007 RNA conditions.
- ***Moderate -*** Moderate impacts are perceptible and measureable changes from pre-2007 RNA conditions that could require remediation.
- ***Substantial*** - Substantial impacts are severe and have the potential to meet the criteria for substantial impacts in CEQ regulations (Title 40 CFR Section 1508.27). Impacts on the biological communities of Buzzards Bay would be considered substantial if disturbances would:
  - have an adverse, long-term impact, either directly or through habitat modifications, on any species identified as a candidate, special concern, threatened, or endangered species by MDFW, NMFS, or USFWS.
  - have a negative effect on or cause a substantial decline in critical habitats including open water, eelgrass beds, beaches, and saltmarshes, that provide important habitat resources for migratory and resident fauna.
  - substantially alter the movement, range or breeding behaviors of resident and migratory fauna.
  - cause a fish or wildlife population to drop below self-sustaining levels.

4.2.2 Potential Impacts

4.2.2.1 Impacts of Oil Spills on the Biological Resources of Buzzards Bay

From a biological perspective, oil spills can have substantial short- and long-term adverse impacts on the kinds of organisms and habitats found in Buzzards Bay. Not only does oil contamination kill or have sublethal physiological and reproductive effects on many individual organisms, oil spills can have substantial adverse population-level effects by reducing foraging resources and nesting habitat.

Studies of previous oil spills in Buzzards Bay show that oil contamination kills large quantities of birds, fish, and invertebrates as well as the *Spartina* grasses that comprise the majority of plants in saltmarshes (Culberton et al 2008). Almost 40 years after the 1969 oil spill in Buzzards Bay, residual oil is still present 3 to 8 inches (8 to 20 centimeters) below the surface of saltmarshes that were contaminated in the 1969 spill (Reddy et al 2002). Research shows that the concentration of oil hydrocarbons below the surface has not changed since 1973 and degraded only partially, suggesting that these oil deposits are likely to persist for many decades. This residual oil reduces below-ground saltmarsh grass biomass, including the roots and rhizomes that are critical to stabilizing saltmarsh sediments (Culberton et al. 2008). Eelgrass beds also have the potential to be negatively affected by oil contamination because oil reduces photosynthesis rates and causes root and shoot mortality. However, eelgrass plants have been shown to be more negatively susceptible to oil dispersant use than oil itself (NOAA 2009).

Benthic organisms vary in their sensitivity to oil spills. *Ampilesca* and other amphipods are sensitive to hydrocarbon contamination while many polychaetes are resistant to high levels of oil pollution in sediments (Gomez Gasteira et al 2003). Although the initial oil spill impact can kill populations of shellfish and fish, the most substantial impact of oil contamination in shellfish and fish populations are sublethal effects, such as decreased or abnormal growth, organ and tissue damage and decreased reproductive rates. Fish and shellfish exposure to hydrocarbons from oil spills can impair cellular processes and negatively impact reproductive rates as well as the survival of the egg and larval stages of development (Carls et al 1999; Whitehead et al 2011; Ortiz-Zarragoitia et al. 2011). Saltmarsh fiddler crabs, *Uca pugnax*, that inhabit saltmarshes contaminated by the 1969 oil spill in Buzzards Bay are chronically exposed to the spilled oil when they burrow into sediments at depths of 2 to 10 inches (5 to 25 centimeters). Crabs exposed to residual oil in Buzzards Bay saltmarshes avoided burrowing into oiled layers, and had lowered feeding rates and lower population densities (Culbertson et al. 2007).

Bird deaths from oil spills are usually the result of either oil ingestion or oiling of feathers, which removes their insulating properties and decreases flight ability. Over 450 bird deaths occurred as a result of the 2003 Bouchard 120 oil spill in Buzzards Bay. Birds are also susceptible to sublethal physiological and reproductive effects of oil spills.

Sea turtles are susceptible to oil contamination through inhalation when they surface to breathe, or through ingestion of soiled plant materials. Sea turtle eggs and hatchlings are susceptible to oil contamination through absorption (NOAA/NMFS 2012).

4.2.2.2 Impacts of the Alternatives

Impacts of Alternative 1 (No Action)

Under Alternative 1, risk of an oil spill in Buzzards Bay would remain unchanged. Since 1969 there have been five incidents of tank barge groundings with oil spills in Buzzards Bay that have had adverse impacts on shoreline habitats, including saltmarshes, and shellfish and bird populations (NOAA 2003). Other organisms including fish, sea turtles and, although extremely rare, North Atlantic right whales in Buzzards Bay could also be severely impacted by oil spills. As noted in Section 3.2, a number of federally and state-listed threatened and endangered species use Buzzards Bay as habitat and their populations could be adversely impacted if an oil spill occurred in the bay or canal. This alternative presents a higher risk for future oil spills than the action alternatives (Alternatives 2 through 5) and is therefore the least desirable option.

Impacts of Alternative 2

Alternative 2 would require the use of tug escorts for single and double hull tank barges that are not self-propelled and carry 6,000 or more barrels of petroleum, with exemptions for some tank barges. The presence of tug escorts for these barges would slightly increase the amount of boat traffic in Buzzards Bay.

Boat traffic can be a hazard to marine species and habitats. Ship strikes can be a substantial source of injury and mortality for sea turtles and other marine animals. In each of the years 2010 and 2011, one sea turtle mortality due to a boat strike in Buzzards Bay was recorded. Given the low number of sea turtle ship strikes and the extremely rare occurrence of whales specifically in Buzzards Bay and the Cape Cod Canal, the slight increase in boat traffic due to tug escorts that would occur under this alternative would likely have a negligible adverse impact on these species. Although not the primary objective, the manning requirement of this alternative, to have one licensed deck officer or barge operator specifically serving as lookout, could aid in spotting turtles or whales and reduce the potential for strikes.

Boat traffic can cause a short-term increase in turbidity and suspended sediments as the result of turbulence from surface wake. Propeller wash of boats can adversely impact photosynthetic rates of aquatic plants that are important habitat for marine animals as well as negatively affect respiration rates and egg and larval development in fish and shellfish (South Carolina Coastal Conservation League 1997; Woods Hole Oceanographic Institution 1998; Asplund 2000). Under this alternative, tug and barge traffic in Buzzards Bay would be restricted to designated, deep-water, shipping channels. The increase in boat traffic under this alternative would cause a minor, transient increase in water turbidity with negligible impacts to benthic, shellfish and fish communities.

Impacts of Alternative 3a

Alternative 3a would require the use of tug escorts for single hull tank barges carrying 5000 or more barrels of petroleum or other hazardous substance. Similar to Alternative 2, Alternative 3a would have an exemption for some tank barges. Use of the VHF system, as required under this alternative, would have the potential to reduce ship strikes against marine animals by providing an early warning system that organisms are present and enable vessel operators to take evasive action.

The escort tug requirement under Alternative 3a would only apply to single hull tank barges and not double hulled. Therefore, it would affect fewer vessels than other alternatives that would require the escort tug for both single and double hull tank barges. Since fewer vessels would be in operation on any given day, the activities required under this alternative would have slightly less impact on biological communities of Buzzards Bay.

Impacts of Alternative 3b

The difference between Alternatives 3a and 3b is that Alternative 3b would require the use of a tug escorts for both single and double hull tank barges. As a result, this alternative would increase the amount of boat traffic in Buzzards Bay over Alternatives 1 and 3a; however, the potential for impacts to sea turtles or whales due to ship strikes would still be minimal. The use of the VHF system may reduce the potential of ship strikes against marine animals by providing an early warning system that organisms are present and enable vessel operators to take evasive action.

Impacts to turbidity would be the same as Alternative 2.

Impacts of Alternative 4

Alternative 4 would require escort tugs for both single and double hull tank barges carrying 5,000 or more barrels of petroleum or other hazardous substance, with exemptions for some tank barges with capacity of more than 25,000 barrels. This alternative would increase the amount of boat traffic in Buzzards Bay more than Alternatives 3a and 3b because of the more inclusive rules regarding the use of tug escorts. Use of the VHF system, as required under this alternative, may reduce the potential of ship strikes against marine animals, similar to other alternatives that include this requirement.

The increase in boat traffic under Alternative 4 would not contribute to a substantial increase in water turbidity because the tug and barge traffic would occur in deep-water shipping channels and be a transient event. Therefore increased boat traffic would have a long-term, minor, negligible impact on water turbidity and benthic, shellfish and fish communities.

Impacts of Alternative 5

Alternative 5 would have the same impacts on biological resources as Alternative 3a.

4.3 Socioeconomics

This section describes the socioeconomic impacts that could result from implementation of each of the alternatives. It includes a description of potential impacts of an oil spill, if one were to occur, which would be applicable to all of the alternatives, followed by the individual impacts of the alternatives.

4.3.1 Significance Criteria

Socioeconomic impacts were evaluated in terms of context (local or regional), type (adverse or beneficial), duration (short- or long-term), and intensity (negligible, moderate, or major).

In this section, intensity is defined as follows:

- ***Negligible or Minor*** - Socioeconomic conditions would not be affected or impacts would not create a noticeable change over pre-207 RNA conditions.
- ***Moderate*** - Impacts would be apparent and cause a minor increase or decrease in local economies and Buzzards Bay communities (25 to 50 percent increase or decrease, if quantifiable).
- ***Major*** - Impacts would substantially alter the social and economic characteristics of Buzzards Bay communities.

4.3.2 Potential Impacts

4.3.2.1 General Impacts of Oil Spills on Socioeconomic Resources of Buzzards Bay

An oil spill can have serious socioeconomic impacts on the affected region, local communities, residents, the state and the federal government. Impacts may include damages to real and personal property, loss of use of natural resources (beaches, parks and recreation areas), and loss of income (fishing, tourism, recreation, and other commerce). As noted in Section 3.4 of this EA, municipalities abutting Buzzards Bay depend on the bay and its resources for a large part of their economic base. As experienced in the past, an oil spill in Buzzards Bay could have both direct and indirect, moderate to major adverse impacts on the economy of Buzzards Bay communities, with indirect, long-term impacts lasting over a several years. Although the risk of an oil spill varies somewhat among the alternatives, the severity of impacts from an oil spill, should one occur, would be the same under any of the alternatives

being considered in this EA. Therefore, the impact of an oil spill to Buzzards Bay municipalities is the same for all alternatives

A combined total of more than 12,000 shellfish licenses are issued annually in Buzzards Bay towns (BBNEP 2012). In recent years many areas of Buzzards Bay have been off limits for shellfishing due to bacterial closures. In addition, oil spills have affected shellfish beds in Buzzards Bay. In 1969 Massachusetts closed shellfish beds in Wild Harbor, Falmouth for at least six years because of the barge Florida spill (BBNEP 2012). In April 2003, the barge Bouchard No. 120 fuel oil spill caused the closure of large areas of Buzzards Bay to shellfish. Most closed areas relating to the Bouchard No. 120 spill were rescinded by October 15, 2004; however, a total of approximately 273 acres in Mattapoisett, Fairhaven, and Dartmouth remained closed through April 2007. As of May 2011, a small area (3.7 acres) just south of Long Island in the town of Fairhaven remained closed because of oil contamination. (BBNEP 2012). The Natural Resource Damage Assessment (NRDA) for the Bouchard No. 120 spill found that a total of 47,298 recreational shellfishing trips were lost at a value of $1.4 million (2009 dollars) as the result of the 2003 oil spill (TWG 2009).

A future oil spill that impacted shellfish beds would cause both short- and long-term shellfish bed closures and reduce and/or eliminate a major source of municipal revenues as the result of a reduced demand for shellfish licenses. Such a scenario would also have a major long-term impact on commercial fishermen that depend on shellfish beds in Buzzards Bay for their living and a potentially major indirect short-term impact on the local economy. The annual value of shellfish harvested from Buzzards Bay in 2003 was estimated at $4 million. Using an economic multiplier effect of 4.5, the estimated value of the catch to the local economy was estimated at $18 million (BBNEP 2011a).

Tourism would also be adversely affected, at least for the short-term, as the result of beach closures and the public assumption of contamination. A drop in tourism would have moderate, direct and indirect impacts on the municipalities and local commercial enterprises. The municipalities would lose income from the sale of beach stickers. Local retail establishments, restaurants and lodging would likely realize a decrease in revenues from a decrease in visitors to the area. Commercial enterprises that offer fishing charters in the bay would also lose business.

Depending on the time of year, an oil spill could have substantial adverse impacts on recreational boating. If a spill was to occur during the recreational boating season and required the closure of portions of the bay or area harbors during clean-up, short-term closures could adversely affect regattas and the associated revenues derived from visitors associated with them. Such impacts would probably be short-term and moderate.

4.3.2.2 Impacts of the Alternatives

Impacts of Alternative 1 (No Action)

Under the No Action alternative, there would be no changes to barge activity in either Buzzards Bay or the Cape Cod Canal and the risk of an oil spill from a single hull tank barge and associated risk of economic impacts to Buzzards Bay municipalities would remain unchanged. As noted above, a future oil spill in Buzzards Bay could have both short-and long-term, moderate to major adverse impacts. As a result, this alternative, which has the highest potential for future oil spills, is the least desirable alternative from a socioeconomic perspective.

Impacts of Alternative 2

Alternative 2 would provide greater protection against an oil spill than Alternative 1, due to its requirement for a dedicated lookout on a towing barge while in Buzzards Bay. Although it requires that a state-licensed pilot direct the barge through Buzzards Bay, it does not require the pilot to be on the primary towing vessel. Because this alternative applies to all single hull vessels, not just barges, it would

affect more vessels than alternative 1 and have a long-term, minor impact on barge owners who would be required to pay for the escort tug. The estimated cost for a tug escort for a one-way transit through Buzzards Bay was $3,200 in 2005 (USCG 2007b). It is assumed that this cost, while minor, would be passed along to consumers. Under MOSPA regulations, state-licensed pilots are provided at the state's (ultimately the taxpayers') expense. Therefore, the addition of a state-licensed pilot would not affect the barge owner's operational costs under this alternative.

Impacts of Alternative 3a

Alternative 3a provides slightly greater protection from an oil spill than Alternative 2 since it applies to single hull tank barges carrying 5,000 or more barrels of petroleum (not limited to oil) and mandates that a federally licensed pilot direct and control from the primary towing vessel while in Buzzards Bay and the Cape Cod Canal. From a socioeconomic perspective, this alternative would have a short-term minor direct adverse impact on barge owners since they would be required to pay for the federal pilot and the escort tug. The estimated cost for a federal pilot on a one-way transit through Buzzards Bay would be about $1,375; the cost for an escort tug would be approximately $3,200 (in 2005 dollars) (USCG 2007b). By requiring escort tugs and federal pilots for single-hull barges only, Alternative 3a would be expected to provide a financial incentive to barge owners/operators to switch to double hull barges as frequently as possible. It is anticipated that this incentive would result in a decrease in the use of single hulled tank vessels sooner than would otherwise occur by the 2015 deadline for the phase-out of these tank vessels Accordingly, by accelerating the reduction in the use of single hull tank vessels, the risk of an incident resulting in the release of hazardous materials will be reduced faster than would occur under the other alternatives.

Impacts of Alternative 3b

Alternative 3b would have similar impacts as Alternative 3a except that it would have a higher and longer-term cost to tank barge owners who would be required to assume the cost of federal pilots for single hull barges and tug escorts for both single and double hull tank barges carrying 5,000 or more barrels of oil or other hazardous substance. While single hull tank barges are to be phased out of service by January 1, 2015, double hull tank barges will continue to operate beyond that date and the cost of the tug escort would, therefore, continue. It is assumed that this cost, would be passed along to consumers.

Impacts of Alternative 4

This alternative would have higher costs to barge owners than Alternative 3b since it would require federal pilots and tug escorts for both single and double hull tank barges carrying 5,000 or more barrels of oil or other hazardous substances. This alternative would apply to the greatest number of vessels, therefore carrying the greatest financial cost to the barge owners. Like Alternative 3b, this cost would continue beyond the January 1, 2015 single hull phase out date. Therefore, this alternative would have a long-term minor adverse cost impact on barge owners. It is assumed that this cost, would be passed along to consumers.

Impacts of Alternative 5

Alternative 5 would have virtually the same socioeconomic impacts as Alternative 3a.

4.4 Public Health and Safety

An incident in Buzzards Bay or the Cape Cod Canal that included the release of oil or a hazardous substance could affect both public health and safety. The number of people affected and the severity of the impact would be based on a number of factors including the volume of the spill, the location of the incident, meteorological conditions, and time of year. Specific human health reactions are

dependent on the material that is released and the extent and type of contact; for example, reactions from acute inhalation of No. 6 fuel oil, which was released in the Bouchard 120 incident in 2003, can include headache, and nausea and vomiting. Skin contact can cause irritation and rash (BBNEP 2011b).

From a public health and safety perspective, Alternative 1 (No Action) is the least desirable of the alternatives since the potential for a substantial accident involving the release of petroleum or other hazardous substance would remain unchanged. While there are slight differences among the alternatives regarding the potential risk for a future incident, overall, implementation of any of the alternatives would have an indirect, beneficial impact on public health and safety.

4.4.1 Impacts of Alternatives

4.4.1.1 Impacts of Alternative 1

Under the No Action alternative, there would be no changes to barge activity in either Buzzards Bay or the Cape Cod Canal and the risk of an oil spill from a single hull tank barge and associated risk of economic impacts to Buzzards Bay municipalities would remain unchanged. As noted above, a future oil spill in Buzzards Bay could have both short- and long-term, moderate to major adverse impacts. As a result, this impact, which has the highest potential for future oil spills, is the least desirable alternative from a public health and safety perspective.

4.4.1.2 Impacts of Alternative 2

Alternative 2 could provide indirect public health benefits by reducing the potential for a spill over Alternative 1. Because it applies to both single and double hull barges, this alternative provides less incentive to barge owners to retire the single hull barges and, therefore, slightly greater risk of exposure to a potential spill to the public than Alternative 3a.

4.4.1.3 Impacts of Alternative 3a

Alternative 3a would provide the greatest indirect public health benefits since it would have the highest probability of reducing the risk of an accidental spill by providing an economic incentive for barge operators to use double hull barges over single hulls. Because the enhanced communication requirements (VMRS) under this alternative apply to all tank barges (both single and double hull), the communication benefit would be very substantial and long-term.

4.4.1.4 Impacts of Alternative 3b

Alternative 3b would provide indirect public health benefits since it would require escort tugs for both single and double hull barges carrying 5,000 or more barrels of oil or other hazardous substance. Because it applies to both single and double hull barges, it provides less incentive to barge owners to retire the single hull barges than Alternative 3a, and therefore, provides slightly greater risk of exposure to a potential spill to the public. It would provide the same long-term benefit from communications requirements as Alternative 3a.

4.4.1.5 Impacts of Alternative 4

Alternative 4 would provide the most conservative long-term public health benefits since it would require escort tugs and a federal pilot onboard the primary towing vessel for both single and double hull barges carrying 5,000 or more barrels of oil or other hazardous substance. Because it applies to both single and double hull barges, this alternative provides less incentive to barge owners to retire the single hull barges and, therefore, slightly greater risk of exposure to a potential spill to the public than Alternative 3a. It would provide the same long-term benefit from communications requirements as Alternative 3a.

4.4.1.6 Impacts of Alternative 5

Alternative 5 would have essentially the same public health impacts as Alternative 4.

5 CUMULATIVE IMPACTS

Cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR § 1508.7).

The Coast Guard identified, as alternatives above, those protections afforded by regulatory measures implemented since the promulgation of the 2007 Final Rule. Further, the USCG and the MDEP intend to jointly conduct a technical risk study and evaluation of measures that may reduce the level of potential risk of an oil spill in Buzzards Bay and the Cape Cod Canal. In particular, the agencies are interested in evaluating the risk reduction benefits and any associated environmental, economic, or other quantitative or qualitative costs of the use of marine pilots and tugboat escorts for ALL towing vessels with laden tank barges, regardless of whether single or double-hulled. The USCG and MDEP anticipate using the results of this study to evaluate the current level of Federal and State regulation for Buzzards Bay and the Canal and to determine whether the USCG should make changes to the pilot and escort system requirements codified at 33 C.F.R. § 165.100, (including the "Special Buzzards Bay Regulations" (33 C.F.R. § 165.100(d)) when it proceeds with a new rulemaking.

The impacts from the 2007 RNA amendments, the RNA that preceded these amendments, the MOSPA, and future federal and state regulations are collectively and incrementally intended to be favorable to the environment through implementation of operational requirements as well as mandated structural characteristics in order to reduce the potential for marine mishaps and minimize the potential for release of petroleum product should such marine mishap occur. However, this benefit to the environment must be achieved while also considering the economic consequences of these measures compared to the benefit(s) reasonably expected to be gained.

No past, present, or reasonably foreseeable future actions were identified for Buzzards Bay or the Cape Cod Canal that, when coupled with any of the alternatives being considered in this EA, would create a substantial environmental impact.

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6 CONCLUSION

This analysis indicates that an Environmental Impact Statement (EIS) will not be necessary for implementation of any of the action alternatives (Alternative 2 through 5). The USCG anticipates that a Finding of No Significant Impact (FONSI) will be appropriate for implementation of Alternative 3a, the 2007 Final Rule. Alternative 3a appears to provide the most time effective means of reducing the occurrence of oil spills on Buzzards Bay and will likely become the USCG's preferred alternative.

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Appendix A

Agency Consultation

This appendix includes the correspondence and attachments that were sent to federal agencies for EA scoping as well as the letter response that was received. The correspondence is provided in the following order:

- Response from U.S. Fish and Wildlife Service, New England Field Office, dated January 17, 2012
- Letter to the U.S. Fish and Wildlife Service, dated December 23, 2012 (with attachments)
- Letter to the National Marine Fisheries Service, dated December 23, 2012
- Letter to the Massachusetts Historical Commission, dated December 23, 2012

Note that the attachments to the letters sent to the agencies were identical and are provided only once in this appendix.

Enc. 1-23-2012

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

January 17, 2012

Ms. Barbara Mohrman
Arcadis U.S., Inc.
326 First Street, Suite 200
Annapolis, MD 21403

Dear Ms. Mohrman:

This responds to your December 23, 2011 letter, requesting that we provide information on the presence of federally endangered or threatened species in the Buzzards Bay area for the preparation of an Environmental Assessment to assess revisions to the Regulated Navigation Area. Our comments are provided in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531, *et seq.*).

Based on information currently available to us, federally threatened piping plover and endangered roseate tern breeding and fall staging habitat is present within Buzzards Bay. These two species can be found generally between April through the end of September. The red knot, a federal candidate, is known to migrate through the Buzzards Bay area during the southward migration in the fall. No other federally listed or proposed species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area.

Thank you for your cooperation. Please contact Susi von Oettingen of this office at 603-223-2541, extension 22, if you have any questions or need additional assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

cc: L. Dhlopolsky, USCG
J. Mauro, USCG

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS U.S., Inc.
326 First Street, Suite 200
Annapolis, Maryland 21403
Tel 410 295 1205
Fax 410 295 1225
[redacted]

Mr. Tony Tur
United States Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301-5087

Subject:
U.S. Coast Guard, First Coast Guard District
Buzzards Bay, Massachusetts
Consultation Request

Date:
December 23, 2011

Contact:
Barbara Mohrman

Phone:
410-295-1205 X15

Email:
barbara.mohrman@arcadis-us.com

Our ref:
MA0011480001

Dear Mr. Tur:

On behalf of the United States Coast Guard (USCG), First Coast Guard District, and in compliance with Section 7 of the Endangered Species Act (16 U.S.C. §1531 et seq.), ARCADIS, U.S., Inc. (ARCADIS) is informing you that the USCG will be preparing an Environmental Assessment (EA) to assess revisions to the previously established Regulated Navigation Area (RNA) on Buzzards Bay, Massachusetts.

The RNA governs maritime transport of petroleum products and other hazardous materials on Buzzards Bay and imposes certain requirements on single-hulled tank barges transiting New England waters, including Buzzards Bay. The EA is being prepared to analyze specific alternatives to the USCG's 2007 Final Rule for further reducing the potential for incidents that could result in the discharge or release of oil or hazardous material to Buzzards Bay, resulting in serious harm to navigable waters or natural features of the Bay, including fish and wildlife.

Table 1 presents a summary of the EA alternatives to be considered in the EA. The EA will evaluate the potential impacts from the imposition of these alternative navigation requirements on commercial vessel operators, as well as the effectiveness of these requirements in reducing the possibility of petroleum and other hazardous material releases. No physical changes to the Bay or coastline are being proposed under the RNA alternatives, and therefore no such changes are being reviewed in the EA. We propose to include summary information on the potential effects of a petroleum or other hazardous material release on fisheries and the environment with the majority of material incorporated into the EA by reference to existing studies and publications.

Imagine the result

ARCADIS

Mr. Tony Tur
December 23, 2011

The geographic bounds of Buzzards Bay that will be regulated by any revisions to the RNA, and therefore are the subject of the USCG EA, are from Sakonnet Point southward to the north end of the Buzzards Bay traffic separation zone, to the southwestern tip of Cutty Hunk Island through Buzzards Bay to the eastern entrance of the Cape Code Canal. Woods Hole Passage and Quicks Hole are also included in the EA study area. Figure 1 shows the location and boundaries of Buzzards Bay to be considered in the EA.

Please contact me at 410.295.1205, Ext. 15 or barbara.mohrman@arcadis-us.com with any questions about the EA. We also invite your comments on any aspect of petroleum and hazardous material transportation regulation on Buzzards Bay as it relates to USFWS programs.

Sincerely,

ARCADIS U.S., Inc.

Barbara Mohrman
Principal Scientist

Attachments

Table 1, Figure 1

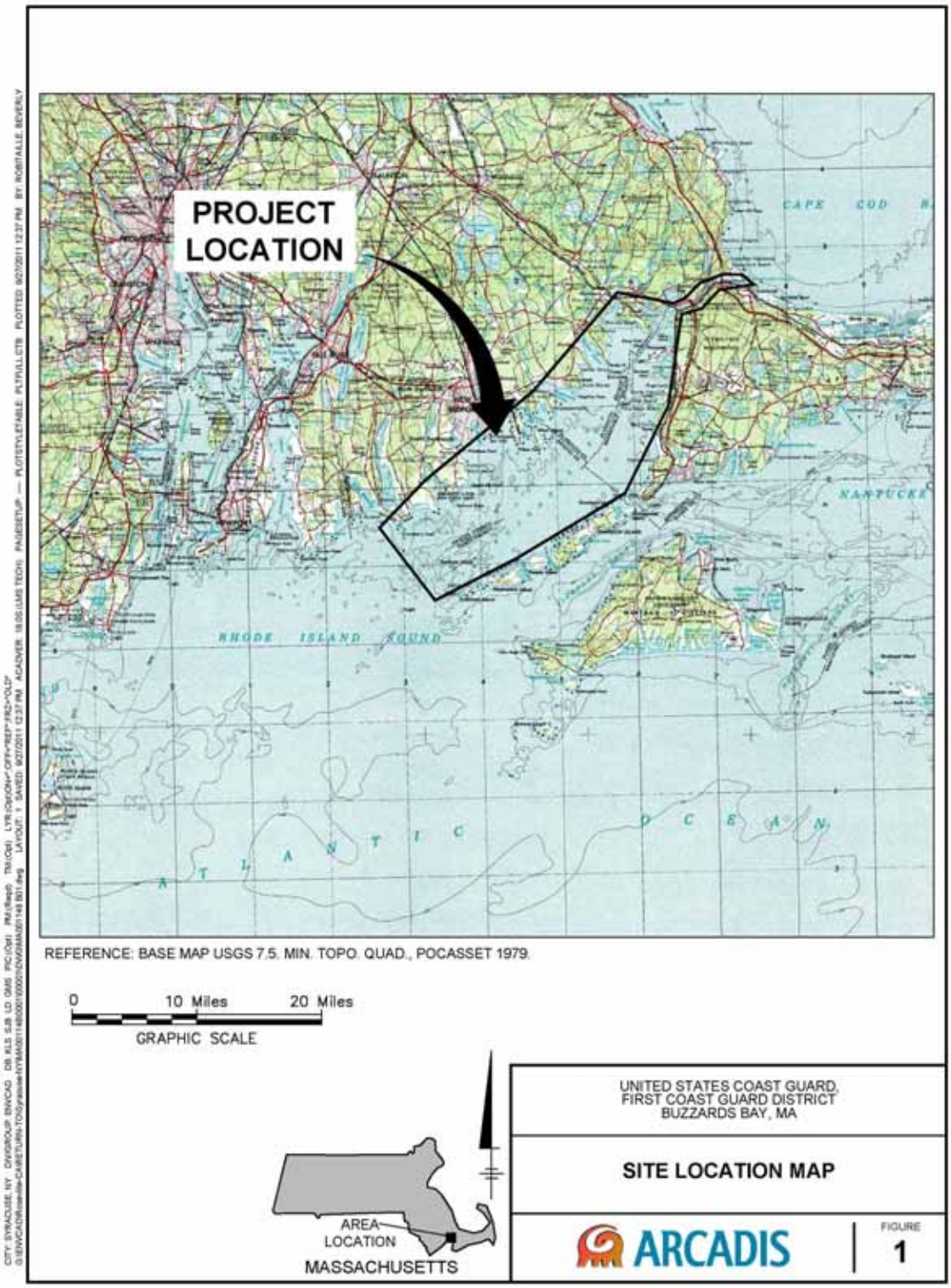
Copies
John Mauro, USCG
Luke Dlhopolsky, USCG
Charles Castelluccio, ARCADIS

United States Coast Guard
Revisions to the Regulated Navigation Area Governing Marine Transport on Buzzards Bay, MA

Table 1
Alternatives

December 2011

Alternative 1: (1) Rules in Effect Prior to 2007 Rule (33 CFR 165.100)	Escort Tug Required For: All Single-hull tank barges carrying petroleum cargo in bulk and being towed by a single-screw tug. EXCEPT: Towing vessel engaged in towing any tank barge in the event of a casualty that impairs navigation and/or seaworthiness of vessel (i.e. fire, parted tow line, loss of power, fog, loss of tow, etc.)	None	None	(A) Every vessel towing a tank barge must communicate on VHF 13 or 16. (B) Every vessel towing a tank barge must issue security calls upon approaching one of 21 enumerated places.	Owner/Operator of towing vessel employed to tow tank barge must prepare a written voyage plan for each transit. Voyage Plan (modifiable by MO as necessary) must contain: i) type, grade, volume of cargo; ii) applicable information from current nautical charts and publications; iii) current and forecasted weather; iv) applicable tide/current data; v) forward and after drafts of the tank barge, and under keel and vertical clearances for each port and berthing area; vi) Pre-departure checklist; vii) Calculated Speed and ETA at proposed waypoints; viii) POC's at VTS, bridges, and facilities, and port specific requirements for VHF radio; ix) Master's (C) detailing CPA, special conditions, and critical maneuvers.	None (in Buzzard's Bay)
	Escort Tug Requirement Exemption (per Captain of Port authorization) for Any tank barge with a capacity ≤25000 barrels operating in limited deployments. (I) Any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug.					No Areas of Restricted Navigation exist in Buzzards Bay. First Coast Guard District only has Areas of Restricted Navigation in Cape Cod Bay, and in the waters around Pollock's Island.
Alternative 2: (2) NEW Rules currently in effect + (1) Rules in effect prior to 2007 Final Rule (33 CFR 165.100)	Escort Tug Required For: All tank vessels carrying ≥5000 barrels of petroleum. ***This rule does not apply to single or double-hull self-propelled tank vessels per MEPC84***	Pilot Requirement: All tank vessels carrying ≥5000 barrels of oil may request state-licensed pilot. Commissioner shall dispatch a state-licensed pilot if such vessel is unaccompanied by a tug or escort. If such vessel has a tug/escort, and does not need a marine tug escort to be dispatched by the Commissioner, a Pilot is not required. ***There is no requirement for the pilot to direct and control the tank vessel from the primary towing vessel per MEPC84***	Navigation Watchstander Requirements For Towing Vessel Carrying ≥5000 Barrels of Oil: two other petroleum products are specified): Onboard shall be (i) One licensed deck officer or vessel operator serving exclusively as lookout. & Three licensed officers or tow vessel operators on tow vessel at all times while engaged in towing.	Vessel Traffic System (VTS) Requirements For Vessels actively Navigating through Buzzards Bay.	Owner/Operator of towing vessel employed to tow tank barge must prepare a written voyage plan for each transit. Voyage Plan (modifiable by MO as necessary) must contain: i) type, grade, volume of cargo; ii) applicable information from current nautical charts and publications; iii) current and forecasted weather; iv) applicable tide/current data; v) forward and after drafts of the tank barge, and under keel and vertical clearances for each port and berthing area; vi) Pre-departure checklist; vii) Calculated Speed and ETA at proposed waypoints; viii) POC's at VTS, bridges, and facilities, and port specific requirements for VHF radio; ix) Master's (C) detailing CPA, special conditions, and critical maneuvers.	Mandatory Route Requirements: Tank vessels shall keep only within a recommended vessel route designated by the USCG unless no route has been designated, an alone special circumstances might make outside a recommended vessel route necessary in order to avoid an imminent navigational hazard.
			Crew Requirements For Tank Barges: Onboard shall be 2 personnel: & One Certified tankerman under 46 CFR 13.20 who shall be on the tank barge at all times (underway, moored, or anchored). & One other person/tankerman member who shall be on the tank barge at all times (underway, moored, or anchored. ***Double hull tank barges are not required to meet this requirement per MEPC84***	(A) Every vessel towing a tank barge must communicate on VHF 13 or 16. (B) Every vessel towing a tank barge must issue security calls upon approaching one of 21 enumerated places.		
Alternative 3: (1) NEW Rules currently in effect + (2) Rules in effect prior to 2007 Final Rule (33 CFR 165.100)	Escort Tug Required For: All Single-hull tank barges being towed by a single screw tug carrying oil or other hazardous substance ≥5000 barrels in addition to its primary tug. (I) Any towing vessel engaged in towing any tank barge in the event of a casualty that impairs navigation and/or seaworthiness of vessel (i.e. fire, parted tow line, loss of power, fog, loss of tow, etc.) Per the (1) 2007 Final Rule, 33 CFR 165.100(a)(1)(i), escort tugs are only required for single-hull tank barges whose primary towing vessels don't have twin screw propulsion. This rule does not apply to single-hull tank barges whose primary towing vessel has twin screw propulsion.	Pilot Requirement: All each single-hull tank barge operating Buzzards Bay and carrying 5,000 or more barrels of oil or other hazardous material must be under the direction and control of a pilot who is not a crewmember. (I) The pilot must direct and control the tank barge from the primary towing vessel.	None	(A) Every vessel towing a tank barge must communicate on VHF 13 or 16. (B) Every vessel towing a tank barge must issue security calls upon approaching one of 21 enumerated places.	Owner/Operator of towing vessel employed to tow tank barge must prepare a written voyage plan for each transit. Voyage Plan (modifiable by MO as necessary) must contain: i) type, grade, volume of cargo; ii) applicable information from current nautical charts and publications; iii) current and forecasted weather; iv) applicable tide/current data; v) forward and after drafts of the tank barge, and under keel and vertical clearances for each port and berthing area; vi) Pre-departure checklist; vii) Calculated Speed and ETA at proposed waypoints; viii) POC's at VTS, bridges, and facilities, and port specific requirements for VHF radio; ix) Master's (C) detailing CPA, special conditions, and critical maneuvers.	Mandatory Vessel Route Requirement: NONE
	Escort Tug Requirement Exemption (per Captain of Port authorization) for Any tank barge with a capacity ≤25000 barrels operating in limited deployments. (I) Any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug.			Any vessel transiting VMRS Buzzards Bay when equipped with bridge-to-bridge radiotelephone as defined in part 26 of chapter 33 and vessels denoted in section 161.16 of chapter 33: i) Must not enter or get underway without notifying VMRS; ii) Must not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition (33 CFR 161.2) exist; iii) Use shortest, safest tow hawser possible; iv) Before meeting, crossing, or overtaking another VMRS user, communicate using bridge-to-bridge radiotelephone, intended navigation movements and any other information necessary in order to make safe passing arrangements. ***THIS RULE applies to tank barges, not tank ships***		Recommended Vessel Route Requirement (At the USCG's request, NOAA created recommended vessel routes on navigational charts 13205, 13218, 13221, and 13232)
Alternative 4: (1) 2007 Final Rule (33 CFR 165.100) plus Additional requiring pilot and tug escort for single- an double-hull barges	Escort Tug Required For: Any tank barge, both single and double-hull, carrying more than 5,000 barrels of oil. If (1) Any towing vessel engaged in towing any tank barge in the event of a casualty that impairs navigation and/or seaworthiness of vessel (i.e. fire, parted tow line, loss of power, fog, loss of tow, etc.) ***This rule does not apply to self-propelled tank vessels***	Pilot Requirement: All each single hull/double barge transiting Buzzards Bay and carrying 5,000 or more barrels of oil or other hazardous material must be under the direction and control of a pilot who is not a crewmember. (I) The pilot must direct and control the tank barge from the primary towing vessel.	Navigation Watchstander Requirements For Towing Vessel Carrying ≥5000 Barrels of Oil: two other petroleum products are specified): Onboard shall be (i) One licensed deck officer or vessel operator serving exclusively as lookout. & Three licensed officers or tow vessel operators on tow vessel at all times while engaged in towing.	Vessel Traffic System (VTS) Requirements For Vessels actively Navigating through Buzzards Bay.	Owner/Operator of towing vessel employed to tow tank barge must prepare a written voyage plan for each transit. Voyage Plan (modifiable by MO as necessary) must contain: i) type, grade, volume of cargo; ii) applicable information from current nautical charts and publications; iii) current and forecasted weather; iv) applicable tide/current data; v) forward and after drafts of the tank barge, and under keel and vertical clearances for each port and berthing area; vi) Pre-departure checklist; vii) Calculated Speed and ETA at proposed waypoints; viii) POC's at VTS, bridges, and facilities, and port specific requirements for VHF radio; ix) Master's (C) detailing CPA, special conditions, and critical maneuvers.	Mandatory Vessel Route Requirement: NONE
			Crew Requirements For Tank Barges: Onboard shall be 2 personnel: & One Certified tankerman under 46 CFR 13.20 who shall be on the tank barge at all times (underway, moored, or anchored). & One other person/tankerman member who shall be on the tank barge at all times (underway, moored, or anchored. ***Double hull tank barges are not required to meet this requirement per MEPC84***	Any vessel transiting VMRS Buzzards Bay when equipped with bridge-to-bridge radiotelephone as defined in part 26 of chapter 33 and vessels denoted in section 161.16 of chapter 33: i) Must not enter or get underway without notifying VMRS; ii) Must not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition (33 CFR 161.2) exist; iii) Use shortest, safest tow hawser possible; iv) Before meeting, crossing, or overtaking another VMRS user, communicate using bridge-to-bridge radiotelephone, intended navigation movements and any other information necessary in order to make safe passing arrangements. ***THIS RULE applies to tank barges, not tank ships***		Recommended Vessel Route Requirement (At the USCG's request, NOAA created recommended vessel routes on navigational charts 13205, 13218, 13221, and 13232)
Alternative 5: (1) 2007 Final Rule (33 CFR 165.100) + Additional Rule requiring pilot and tug escort - single and double-hull barges	Escort Tug Required For: Single-hull tank barges being towed by a single-screw tug carrying oil or other hazardous substance ≥5000 barrels in addition to its primary tug. ***THIS RULE applies to tank barges, not tank ships*** Per the (1) 2007 Final Rule, 33 CFR 165.100(a)(1)(i), escort tugs are only required for single-hull tank barges whose primary towing vessels don't have twin screw propulsion. This rule does not apply to single-hull tank barges whose primary towing vessel has twin screw propulsion.	Pilot Requirement: All each single hull/tank barge transiting Buzzards Bay and carrying 5,000 or more barrels of oil or other hazardous material must be under the direction and control of a federally licensed pilot who is not a crewmember. (I) The pilot must direct and control the tank barge from the primary towing vessel.	None	(A) Every vessel towing a tank barge must communicate on VHF 13 or 16. (B) Every vessel towing a tank barge must issue security calls upon approaching Buzzards Bay Midchannel Lighted Buoy (LLNR 16090).	Owner/Operator of towing vessel employed to tow tank barge must prepare a written voyage plan for each transit. Voyage Plan (modifiable by MO as necessary) must contain: i) type, grade, volume of cargo; ii) applicable information from current nautical charts and publications; iii) current and forecasted weather; iv) applicable tide/current data; v) forward and after drafts of the tank barge, and under keel and vertical clearances for each port and berthing area; vi) Pre-departure checklist; vii) Calculated Speed and ETA at proposed waypoints; viii) POC's at VTS, bridges, and facilities, and port specific requirements for VHF radio; ix) Master's (C) detailing CPA, special conditions, and critical maneuvers.	Mandatory Vessel Route Requirement: NONE
	Escort Tug Requirement Exemption (per Captain of Port authorization) for Any tank barge with a capacity ≤25,000 barrels operating in limited deployments. (I) Any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug.			Any vessel transiting VMRS Buzzards Bay when equipped with bridge-to-bridge radiotelephone as defined in part 26 of chapter 33 and vessels denoted in section 161.16 of chapter 33: i) Must not enter or get underway without notifying VMRS; ii) Must not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition (33 CFR 161.2) exist; iii) Use shortest, safest tow hawser possible; iv) Before meeting, crossing, or overtaking another VMRS user, communicate using bridge-to-bridge radiotelephone, intended navigation movements and any other information necessary in order to make safe passing arrangements. ***THIS RULE applies to tank barges, not tank ships***		Recommended Vessel Route Requirement (At the USCG's request, NOAA created recommended vessel routes on navigational charts 13205, 13218, 13221, and 13232)
Alternative 6: (1) 2007 Final Rule (33 CFR 165.100) + Requirement that only tank barges carrying ≥5000 barrels of petroleum participate in the VMRS.	Escort Tug Required For: All Single-hull tank barges carrying petroleum cargo ≥5000 barrels and being towed by a single-screw tug. (I) Any towing vessel engaged in towing any tank barge in the event of a casualty that impairs navigation and/or seaworthiness of vessel (i.e. fire, parted tow line, loss of power, fire, loss of tow, etc.) ***THIS RULE applies to tank barges, not tank ships***	Pilot Requirement: All tank vessels carrying ≥5000 barrels of petroleum shall be boarded and controlled by a federally licensed pilot who is not a crewmember. (I) The pilot must direct and control the tank barge from it's primary towing vessel.	None	(A) Every vessel towing a tank barge must communicate on VHF 13 or 16. (B) Every vessel towing a tank barge must issue security calls upon approaching Buzzards Bay Midchannel Lighted Buoy (LLNR 16090).	Owner/Operator of towing vessel employed to tow tank barge must prepare a written voyage plan for each transit. Voyage Plan (modifiable by MO as necessary) must contain: i) type, grade, volume of cargo; ii) applicable information from current nautical charts and publications; iii) current and forecasted weather; iv) applicable tide/current data; v) forward and after drafts of the tank barge, and under keel and vertical clearances for each port and berthing area; vi) Pre-departure checklist; vii) Calculated Speed and ETA at proposed waypoints; viii) POC's at VTS, bridges, and facilities, and port specific requirements for VHF radio; ix) Master's (C) detailing CPA, special conditions, and critical maneuvers.	Mandatory Vessel Route Requirement: NONE
	Escort Tug Requirement Exemption (per Captain of Port authorization) for Any tank barge with a capacity ≤25,000 barrels operating in limited deployments. (I) Any tank barge whose operator demonstrates the employment of an equivalent amount of safety to that provided by an escort tug.			All tank barges carrying petroleum cargo ≥5000 barrels must participate in VMRS: i) Must not enter or get underway without notifying VMRS; ii) Must not enter VMRS Buzzards Bay if a Hazardous Vessel Operating Condition (33 CFR 161.2) exist; iii) Use shortest, safest tow hawser possible; iv) Before meeting, crossing, or overtaking another VMRS user, broadly communicate using bridge-to-bridge radiotelephone, intended navigation movements and any other information necessary in order to make safe passing arrangements.		Recommended Vessel Route Requirement (At the USCG's request, NOAA created recommended vessel routes on navigational charts 13205, 13218, 13221, and 13232)


PROJECT LOCATION
CAPE COD
NANTUCKET
RHODE ISLAND SOUND
ATLANTIC OCEAN
REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., POCASSET 1979.
0
10 Miles
20 Miles
GRAPHIC SCALE
AREA LOCATION
MASSACHUSETTS
UNITED STATES COAST GUARD
FIRST COAST GUARD DISTRICT
BUZZARDS BAY, MA
SITE LOCATION MAP
ARCADIS
FIGURE
1

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS U.S., Inc.
326 First Street, Suite 200
Annapolis, Maryland 21403
Tel 410 295 1205
Fax 410 295 1225

Mr. Peter Colosi
Assistant Regional Administrator
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Subject:
U.S. Coast Guard, First Coast Guard District
Buzzards Bay, Massachusetts
Consultation Request

Date:
December 23, 2011

Contact:
Barbara Mohrman

Phone:
410-295-1205 X15

Email:
barbara.mohrman@arcadis-us.com

Our ref:
MA0011480001

Dear Mr. Colosi:

On behalf of the United States Coast Guard (USCG), First Coast Guard District, and in compliance with Section 7 of the Endangered Species Act (16 U.S.C. §1531 et seq.) and the Magnuson Stevens Fishery Conservation and Management Act (PL 94-265), ARCADIS, U.S., Inc. (ARCADIS) is informing you that the USCG will be preparing an Environmental Assessment (EA) to assess revisions to the previously established Regulated Navigation Area (RNA) on Buzzards Bay, Massachusetts.

The RNA governs maritime transport of petroleum products and other hazardous materials on Buzzards Bay and imposes certain requirements on single-hulled tank barges transiting New England waters, including Buzzards Bay. The EA is being prepared to analyze specific alternatives to the USCG's 2007 Final Rule for further reducing the potential for incidents that could result in the discharge or release of oil or hazardous material to Buzzards Bay, resulting in serious harm to navigable waters or natural features of the Bay, including fish and wildlife and essential fish habitat (EFH).

Table 1 presents a summary of the alternatives to be considered in the EA. The EA will evaluate the potential impacts from the imposition of these alternative navigation requirements on commercial vessel operators, as well as the effectiveness of these requirements in reducing the possibility of petroleum and other hazardous material releases. No physical changes to the Bay or coastline are being proposed under the RNA alternatives, and therefore no such changes are being reviewed in the EA. We propose to include summary information on the potential effects of a petroleum or other hazardous material release on fisheries and the environment with the majority of material incorporated into the EA by reference to existing studies and publications.

ARCADIS

Mr. Peter Colosi
December 23, 2011

The geographic bounds of Buzzards Bay that will be regulated by any revisions to the RNA, and therefore are the subject of the USCG EA, extend from Sakonnet Point southward to the north end of the Buzzards Bay traffic separation zone, to the southwestern tip of Cutty Hunk Island through Buzzards Bay to the eastern entrance of the Cape Code Canal. Woods Hole Passage and Quicks Hole are also included in the EA study area. Figure 1 shows the location and boundaries of Buzzards Bay to be considered in the EA.

Please contact me at 410.295.1205, Ext. 15 or barbara.mohrman@arcadis-us.com with any questions about the EA. We also invite your comments on any aspect of petroleum and hazardous material transportation regulation on Buzzards Bay as it relates to NMFS programs.

Sincerely,

ARCADIS U.S., Inc.

Barbara Mohrman
Principal Scientist

Attachments:

Table 1, Figure 1

Copies:
John Mauro, USCG
Luke Dlhopolsky, USCG
Charles Castelluccio, ARCADIS

Page:
2/2

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS U.S., Inc.
326 First Street, Suite 200
Annapolis, Maryland 21403
Tel 410 295 1205
Fax 410 295 1225

Ms. Brona Simon
SHPO & Executive Director
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

Subject:
U.S. Coast Guard, First Coast Guard District
Buzzards Bay, Massachusetts
Project Notification Form

Date:
December 23, 2011

Contact:
Barbara Mohrman

Phone:
410-295-1205 X15

Email:
barbara.mohrman@arcadis-us.com

Our ref:
MA0011480001

Dear Ms. Simon:

On behalf of the United States Coast Guard (USCG), First Coast Guard District, and in compliance with Section 106 of the National Historic Preservation Act, ARCADIS, U.S., Inc. (ARCADIS) is informing you that the USCG will be preparing an Environmental Assessment (EA) to assess the potential for environmental impacts from revisions to the previously established Regulated Navigation Area (RNA) on Buzzards Bay, Massachusetts.

The current RNA governs maritime transport of petroleum products and other hazardous materials on Buzzards Bay and imposes certain requirements on single-hulled tank barges transiting New England waters, including Buzzards Bay. The EA is being prepared to analyze alternatives to the USCG's 2007 Final Rule for further reducing the potential for incidents that could discharge or release oil or hazardous material to Buzzards Bay resulting in serious harm, to navigable waters, natural features of the Bay or other resources, including those with cultural significance.

Table 1 presents a summary of the EA alternatives to be considered in the EA. The EA will evaluate potential impacts resulting from imposition of alternative navigation requirements on commercial vessel operators as well as the effectiveness of these requirements in reducing the possibility of petroleum and other hazardous material releases. No physical changes to the Bay or coastlines are being proposed under the RNA alternatives and therefore no such changes are being reviewed in the EA.

ARCADIS

Ms. Brona Simon
December 23, 2011

The area of potential effect (APE), defined as the geographic bounds of Buzzards Bay that will be regulated by any revisions to the RNA and therefore is the subject of the USCG EA, extends from Sakonnet Point southward to the north end of the Buzzards Bay traffic separation zone, to the southwestern tip of Cutty Hunk Island through Buzzards Bay to the eastern entrance of the Cape Code Canal. Woods Hole Passage and Quicks Hole are also included in the study area. Figure 1 shows the location and boundaries of the APE.

As defined under 36 CFR 800.16(y) the intended regulatory action by the Coast Guard qualifies as an "undertaking". However, pursuant to 36 CFR 800.3(a)(1), the USCG has determined that while the intent of this action is to reduce the potential for impacts to resources that exist on the coast or within Buzzards Bay, it will not directly, or indirectly, affect cultural resources. The EA will note this "no effect" determination and no further analysis of effects on historic or cultural resources is anticipated. Your comments regarding this determination are invited in accordance with Section 106 of the National Historic Preservation Act.

Please contact me at 410.295.1205, Ext. 15 or barbara.mohrman@arcadis-us.com with any questions you may have regarding this determination or the EA. We will notify you when the EA is available.

Sincerely,

ARCADIS U.S., Inc.

Barbara Mohrman
Principal Scientist

Enclosures:
Table 1, Figure 1

Copies:
John Mauro, USCG
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Appendix B

CFR Listing of the RNA prior to the 2007 Final Rule

(2) All vessel operators shall comply with the instructions of the Captain of the Port (COTP) or the designated on-scene U.S. Coast Guard patrol personnel. On-scene Coast Guard patrol personnel include commissioned, warrant, and petty officers of the Coast Guard on board Coast Guard, Coast Guard Auxiliary, local, state, and federal law enforcement vessels.

EFFECTIVE DATE NOTE: By CGD01-02-058, 67 FR 34614, May 15, 2002, §165.T01-058 was added, effective May 13, 2002, until July 13, 2002.

§ 165.100 Regulated Navigation Area: Navigable waters within the First Coast Guard District.

(a) *Regulated navigation area.* All navigable waters of the United States, as that term is used in 33 CFR 2.05-25(a), within the geographic boundaries of the First Coast Guard District, as defined in 33 CFR 3.05-1(b).

(b) *Definitions.* Terms used in this section have the same meaning as those found in 33 CFR 157.03. Single-hull identifies any tank barge that is not a double-hull tank barge.

(c) *Applicability.* This section applies to primary towing vessels engaged in towing tank barges carrying petroleum oil in bulk as cargo in the regulated navigation area, or as authorized by the District Commander.

(d) *Regulations*—(1) *Positive control for barges.* (i) Except as provided in paragraph (d)(1)(iii) of this section, each single-hull tank barge, unless being towed by a primary towing vessel with twin-screw propulsion and with a separate system for power to each screw, must be accompanied by an escort or assist tug of sufficient capability to promptly push or tow the tank barge away from danger of grounding or collision in the event of—

(A) A propulsion failure;
(B) A parted towing line;
(C) A loss of tow;
(D) A fire;
(E) Grounding;
(F) A loss of steering; or
(G) Any other casualty that affects the navigation or seaworthiness of either vessel.

(ii) Double-hull tank barges are exempt from paragraph (d)(1)(i) of this section.

(iii) The cognizant Captain of the Port (COTP), upon written application, may authorize an exemption from the requirements of paragraph (d)(1)(i) of this section for—

(A) Any tank barge with a capacity of less than 25,000 barrels, operating in an area with limited depth or width such as a creek or small river; or

(B) Any tank barge operating on any waters within the COTP Zone, if the operator demonstrates to the satisfaction of the COTP that the barge employs an equivalent level of safety to that provided by the positive control provisions of this section. Each request for an exemption under this paragraph must be submitted in writing to the cognizant COTP no later than 7 days before the intended transit.

(iv) The operator of a towing vessel engaged in towing any tank barge must immediately call for an escort or assist tug to render assistance in the event of any of the occurrences identified in paragraph (d)(1)(i) of this section.

(2) *Enhanced communications.* Each vessel engaged in towing a tank barge must communicate by radio on marine band or Very High Frequency (VHF) channel 13 or 16, and issue securité calls on marine band or VHF channel 13 or 16, upon approach to the following places:

(i) Execution Rocks Light (USCG Light List No. [LLNR] 21440).
(ii) Matinecock Point Shoal Buoy (LLNR 21420).
(iii) 32A Buoy (LLNR 21380).
(iv) Cable and Anchor Reef Buoy (LLNR 21330).
(v) Stratford Middle Ground Light (LLNR 21260).
(vi) Old Field Point Light (LLNR 21275).
(vii) Approach to Stratford Point from the south (NOAA Chart 12370).
(viii) Falkner Island Light (LLNR 21170).
(ix) TE Buoy (LLNR 21160).
(x) CF Buoy (LLNR 21140).
(xi) PI Buoy (LLNR 21080).
(xii) Race Rock Light (LLNR 19815).
(xiii) Valiant Rock Buoy (LLNR 19825).
(xiv) Approach to Point Judith in vicinity of Block Island ferry route.
(xv) Buzzards Bay Entrance Light (LLNR 630).

(xvi) Buzzards Bay Midchannel Lighted Buoy (LLNR 16055)

(xvii) Cleveland East Ledge Light (LLNR 16085).

(xviii) Hog Island buoys 1 (LLNR 16130) and 2 (LLNR 16135).

(xix) Approach to the Bourne Bridge.

(xx) Approach to the Sagamore Bridge.

(xxi) Approach to the eastern entrance of Cape Cod Canal.

(3) *Voyage planning.* (i) Each owner or operator of a towing vessel employed to tow a tank barge shall prepare a written voyage plan for each transit of the tank barge.

(ii) The watch officer is authorized to make modifications to the plan and validate it as necessary.

(iii) Except as provided in paragraph (d)(3)(iv) of this section, each voyage plan must contain:

(A) A description of the type, volume, and grade of cargo.

(B) Applicable information from nautical charts and publications, including Coast Pilot, Coast Guard Light List, and Coast Guard Local Notice to Mariners, for the destination(s).

(C) Current and forecasted weather, including visibility, wind, and sea state for the destination(s).

(D) Data on tides and tidal currents for the destination(s).

(E) Forward and after drafts of the tank barge, and under-keel and vertical clearances for each port and berthing area.

(F) Pre-departure checklists.

(G) Calculated speed and estimated times of arrival at proposed waypoints.

(H) Communication contacts at Vessel Traffic Service (VTS) (if applicable), bridges, and facilities, and port-specific requirements for VHF radio.

(I) The master's standing orders detailing closest points of approach, special conditions, and critical maneuvers.

(iv) Each owner or operator of a tank barge on an intra-port transit of not more than four hours may prepare a voyage plan that contains:

(A) The information described in paragraphs (d)(3)(iii)(D) and (E) of this section.

(B) Current weather conditions including visibility, wind, and sea state. This information may be entered in either the voyage plan or towing vessel's log book.

(C) The channels of VHF radio to monitor.

(D) Other considerations such as availability of pilot, assist tug, berth, and line-handlers, depth of berth at mean low water, danger areas, and securité calls.

(4) *Navigation restriction areas.* Unless authorized by the cognizant COTP, no tank barge may operate in—

(i) The waters of Cape Cod Bay south of latitude 42°5′ North and east of longitude 70°25′ West; or

(ii) The waters of Fishers Island Sound east of longitude 72°2′ West, and west of longitude 71°55′ West.

(e) In addition to the authority for this part 165, this section is also authorized under authority of section 311, Pub. L. 105–383.

[CGD1–98–151, 63 FR 71770, Dec. 30, 1998, as amended by CGD01–98–151, 64 FR 12749, Mar. 15, 1999; USCG–1999–5832, 64 FR 34715, June 29, 1999; CGD01–98–151, 65 FR 35838, June 6, 2000]

§ 165.101 Kittery, Maine—regulated navigation area.

(a) The following is a regulated navigation area—Waters within the boundaries of a line beginning at 43°04′50″N, 70°44′52″W; then to 43°04′52″N, 70°44′53″W; then to 43°04′59″N, 70°44′46″W; then to 43°05′05″N, 70°44′32″W; then to 43°05′03″N, 70°44′30″W; then to the beginning point.

(b) Regulations—No vessel may operate in this area at a speed in excess of five miles per hour.

§ 165.102 Security Zone: Walkers Point, Kennebunkport ME.

(a) *Location.* The following area is a security zone: From point of land located on Cape Arundel at latitude 43°20.4′ North, longitude 070°28.0′ West; thence to a point approximately 500 yards southwest of Walkers Point located at latitude 43°20.2′ North, longitude 070°27.9′ West; thence to a point located approximately 500 yards south of Walkers Point at latitude 43°20.1′ North, longitude 070°27.6′ West; thence to a point located approximately southeast of Walkers Point at latitude 43°20.4′ North, longitude 070°27.2′ West; thence to an unnamed point of land located at 43°20.9′ North, longitude