DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

REPLY TO
ATTENTION OF

CEMP-CE

June 22, 2016

MEMORANDUM FOR US Army Engineer Division, North Atlantic Division CENAD-PD-I (H. Sullivan) 301 General Lee Ave, Brooklyn, NY 11252

SUBJECT: Approval of the Decision Document for Tisbury Great Pond Munitions Response Sites (MRS), Martha's Vineyard, Massachusetts, Formerly Used Defense Site (FUDS), Property No. D01MA 0453, Project Nos. 01 and 02.

1. Reference email dated 25 May from CENAD, subject as above, copy enclosed.

2. The subject Decision Document dated, May 2016 has been reviewed by CECC-E and CEPA-MP.

3. This document presents a selected remedy with a total present worth cost estimate of $9,868,000.00 consisting of Munitions and Explosives of Concern (MEC) Subsurface Clearance for Project No. 01 and No Action for Project 02.

4. This Decision Document is approved and forwarded to you, pursuant to DAIM-ZA memo dated September 9, 2003, subject: Policies for Staffing and Approving Decision Documents, and to Engineer Regulation 200-3-1, FUDS Program Policy, dated 10 May 2004.

5. Please ensure that this document is filed in accordance with Records Management procedures, in both the Administrative Record and the Permanent Project File. Also, please ensure that the FUDS Management Information System is updated with this approval in the Property Information, Record of Decision/Decision Document screen.

6. Point of contact for this action is Mr. Mark Seebeck, CEMP-CED, 202-761-1863, or via email at Mark.Seebeck@usace.army.mil.

Encls
Decision Document Packet

KAREN J. BAKER
Chief, Environmental Division
Directorate of Military Programs

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

CENAE-PP-M

19 May 2016

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, HQUSACE, (Mr. Mark Seebeck) Chief, Environmental Community of Practice, CEMP-CED, 441 G Street NW, Washington, DC 20314-1000

SUBJECT: Request for approval of the Tisbury Great Pond Formerly Used Defense Site (FUDS), Martha's Vineyard, Massachusetts Decision Document

1. References:

a) USACE 2014. *Final Remedial Investigation Report for Tisbury Great Pond Formerly Used Defense Site (FUDS) Property No. D01MA0453, Martha's Vineyard, Massachusetts. August 2014.*

b) USACE 2015. *Final Feasibility Study for Tisbury Great Pond Formerly Used Defense Site (FUDS) Property No. D01MA0453, Martha's Vineyard, Massachusetts. June 2015.*

c) USACE 2015. *Proposed Plan for Tisbury Great Pond Formerly Used Defense Site (FUDS) Property No. D01MA0453, Martha's Vineyard, Massachusetts. June 2015.*

2. In accordance with FUDS policy (ER 200-1-3), an approved Decision Document is required to render final approval to the selected remedy for the Tisbury Great Pond FUDS as discussed in the enclosed Tisbury Great Pond Decision Document. Approval of a Decision Document with a present worth cost estimate of greater than $2,000,000 but less than $10,000,000 rests with the Chief, Environmental Programs, Directorate of Military Programs, Headquarters U.S. Army Corps of Engineers.

3. The Tisbury Great Pond Decision Document covers two Munitions Response Sites (MRS) at the FUDS; MRS 01 "Tisbury Great Pond" and MRS 02 "Remaining Land and Water". The present worth cost estimate for MRS 01 Alternative 4 is $9.8 Million (according to the Feasibility Study report). The estimated time to complete remediation is approximately 18 months. MRS 02 was determined to be No Further Action after the RI, therefore, alternatives were not evaluated in the Feasibility Study.

4. Between August 1943 and July 1947, the FUDS was used as a practice dive bombing and strafing range. The site was utilized to support the U.S. Navy's fighter training program at Quonset Point Naval Air Station, Rhode Island and the Naval Auxiliary Air Station, Martha's Vineyard, Massachusetts. It is believed that military activities ceased at the site by the end of the World War II. On 27 March 1947, the site was reinstate for practice bombing use by the carrier fleet based at Newport, Rhode Island. On 29 July 1947, the Commander of the 1st Naval District reported that the Tisbury Great Pond Area was excess to the needs of the U.S. Navy, and the area was closed.

5. The selected remedies were chosen by the U.S. Army Corps of Engineers (USACE) in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and with concurrence from Mass DEP. The selected remedies are based on the information contained in the Administrative Record for the site and the public's input to the Remedial Investigation (RI), Feasibility Study (FS) and Proposed Plan. Based on the evaluation presented in the Remedial Investigation, Feasibility Study and the Proposed Plan, and stakeholder responses during the Proposed Plan public meeting, Alternative 4 was selected for MRS 01- Tisbury Great Pond. The Alternative includes surface and subsurface clearance. No Action is proposed at MRS 02 Remaining Land and Water.

6. The Project staff has performed extensive coordination with members of the public in selecting the remedy and finalizing the above referenced Decision Document Report. The USACE released the Proposed Plan for a 30-day public comment period on June 15, 2015, and presented the plan at a public meeting on June 23, 2015. The public comment period was extended and ended on August 27, 2015. Questions and comments from the public were recorded for the record. A number of oral and written comments were received on the preferred alternative presented in the Proposed Plan. Public comments have been reviewed and revisions have been incorporated into the Final Decision Document. Based on comments received, the property owner concurred with the selected alternative. Based on this input, the USACE in consultation with the Mass DEP has selected Alternative 4.

7. The regulatory agency involved with the development and finalization of the Decision Document is the Massachusetts Department of Environmental Protection. The concurrence letter from the Mass DEP is attached.

8. Reviewers at the USACE Environment & Munitions Center of Expertise (EMCX) have been involved with the review and revision of the Decision Document. The final EMCX comment resolution package is attached.

9. I request your approval of the attached Decision Document.

Attachments

CHRISTOPHER J. BARRON
COL, EN
Commanding

May 2016

Final

# DECISION DOCUMENT

**TISBURY GREAT POND**
**MUNITIONS RESPONSE SITES**
**MARTHA'S VINEYARD, MASSACHUSETTS**

**FUDS Property No. D01MA0453**
**Projects 01 and 02**

**U. S. ARMY CORPS OF ENGINEERS**
**NEW ENGLAND DISTRICT**

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# TABLE OF CONTENTS

## FIGURES



## TABLES

## ACRONYMS

| | |
|---|---|
| 2,6-DNT | 2,6-dinitrotoluene |
| 2,4,6-TNT | 2,4,6-trinitrotoluene |
| 3Rs | Recognize, Retreat and Report |
| AR | Administrative Record |
| ARAR | Applicable or Relevant and Appropriate Requirements |
| ASR | Archive Search Report |
| bgs | below ground surface |
| BIP | Blow-in-Place |
| B.P.B.A. | Black Point Beach Association |
| CERCLA | Comprehensive Environment Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| CMR | Code of Massachusetts Regulations |
| DD | Decision Document |
| DERP | Defense Environmental Restoration Program |
| DGM | Digital Geophysical Mapping |
| DoD | Department of Defense |
| EOD | Explosive Ordnance Disposal |
| FS | Feasibility Study |
| ft | foot or feet |
| FUDS | Formerly Used Defense Site |
| GPS | Global Positioning System |
| HA | Hazard Assessment |
| HHRA | Human Health Risk Assessment |
| INPR | Inventory Project Report |
| lb(s) | pound(s) |
| LUC | Land Use Control |
| MADEP | Massachusetts Department of Environmental Protection |
| MA NHESP | Massachusetts Natural Heritage Endangered Species Program |
| MC | Munitions Constituents[1] |
| MD | Munitions Debris[2] |
| MDAS | Material Documented as Safe |
| MDFW | Massachusetts Division of Fisheries and Wildlife |
| MEC HA | Munitions and Explosives of Concern Hazard Assessment |
| MEC | Munitions and Explosives of Concern[3] |
| MK | Mark |
| MMRP | Military Munitions Response Program |
| MPPEH | Material Potentially Presenting an Explosive Hazard |
| MRA | Munitions Response Area |
| MRS | Munitions Response Site |
| msl | mean sea level |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NEBTB | Northeastern Beach Tiger Beetle |
| NG | Nitroglycerin |
| NOAA NMFS | National Atmospheric and Oceanic Administration - National Marine Fisheries Service |

| | |
|---|---|
| OE | Ordnance and Explosives |
| PH | Priority Habitat |
| PIP | Public Involvement Plan |
| PP | Proposed Plan |
| RAO | Remedial Action Objective |
| RI | Remedial Investigation |
| ROE | Right of Entry |
| SARA | Superfund Amendments and Reauthorization Act |
| SIR | Site Inspection Report |
| SLERA | Screening Level Ecological Risk Assessment |
| TDEMI | Time Domain Electromagnetic Induction |
| TMV | Toxicity, Mobility and Volume |
| TTOR | The Trustees of Reservations |
| U.S. | United States |
| USACE | United States Army Corps of Engineers |
| USAESCH | United States Army Engineering Support Center, Huntsville |
| USC | United States Code |
| USDA-SCS | United States Department of Agriculture – Soil Conservation Service |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| UU/UE | Unlimited Use and Unrestricted Exposure |
| UXB | UXB International, Inc. |
| UXO | Unexploded Ordnance |
| VRH | VRHabilis, LLC |
| WT | West Tisbury |

[1]MC – Any material that originates from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S.C. 2710(e)(4)).

[2]MD – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal. (DoD 6055.09-M).

[3]MEC – Military munitions that are 1) unexploded ordnance, as defined in 10 U.S.C. 101(e)(5); 2) abandoned or discarded, as defined in 10 U.S.C. 2710(e)(2); 3) MC (e.g., TNT, RDX) present in soil, facilities, equipment, or other materials in high enough concentrations so as to pose an explosive hazard. (MRSPP, 32 CFR Part 179, October 2005).

# EXECUTIVE SUMMARY

This Decision Document (DD) documents the approval of the selected remedial action consisting of Munitions and Explosives of Concern (MEC) subsurface clearance at the Tisbury Great Pond Munitions Response Site (MRS) ("Tisbury Great Pond MRS") Project 01 and No Action at the Tisbury Great Pond MRS ("Remaining Land and Water MRS") Project 02, within the Tisbury Great Pond Munitions Response Area (MRA), a Formerly Used Defense Site (FUDS), Property No. D01MA0453.

The FUDS acreage is approximately 1082 acres. MEC has been found within the FUDS boundary with contaminated areas covering approximately 123 acres (Tisbury Great Pond MRS). The remaining uncontaminated lands comprise 959 acres (Remaining Land and Water MRS).

The Selected Remedy for the Tisbury Great Pond MRS is Subsurface Clearance. USACE has determined that the response actions selected in this DD for MEC at the Tisbury Great Pond MRS are necessary to protect public health, welfare, and the environment from the hazards associated with direct exposure to MEC released into the dynamic coastal environment, based on the current and intended future use of the MRS.

The Selected Remedy is expected to achieve Unlimited Use/Unrestricted Exposure (UU/UE). However, to verify that the selected remedy (1) achieves UU/UE in the lands within the MRSs, (2) is protective of human health and the environment, and (3) that restoration of the site has been successful, a final review, similar to a statutory five year review will be performed after all planned remediation is complete to verify the selected remedy has achieved UU/UE. Work at Tisbury Great Pond MRS will start in Fiscal Year 2016. Once UU/UE is verified, the project can be closed out and no additional funds will be needed.

The present worth cost estimate for the Tisbury Great Pond MRS Alternative 4, Subsurface Clearance is $9,868,000; and the Remaining Land and Water MRS No Action Decision is $0. It is estimated that the Tisbury Great Pond MRS Alternative 4 would require approximately 6 months planning and 12 months of field work to implement.

Other potential remedies considered included No Action, Land Use Controls (LUCs) only, and Partial Subsurface MEC Clearance with LUCs for the Tisbury Great Pond MRS. No other remedies were considered for the Remaining Land and Water MRS since no contamination was found.

# 1. DECLARATION

## 1.1 Project Name and Location

The Tisbury Great Pond Munitions Response Site ("Tisbury Great Pond MRS") Project 01 and the Tisbury Great Pond MRS ("Remaining Land and Water MRS") Project 02, are located in Dukes County in the town of West Tisbury and Chilmark, Martha's Vineyard, Massachusetts. The two MRSs are within the Tisbury Great Pond Munitions Response Area (MRA), a Formerly Used Defense Site (FUDS), Property No. D01MA0453.

## 1.2 Statement of Basis and Purpose

This Decision Document (DD) presents the United States Army Corps of Engineers (USACE) selected remedy consisting of Munitions and Explosives of Concern (MEC) subsurface clearance at the Tisbury Great Pond MRS and No Action at the Remaining Land and Water MRS.

This DD is a requirement of Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 United States Code [USC] § 9617), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, also known as Superfund, and follows the requirements of USACE Engineer Regulation 200-3-1, FUDS Program Policy, and the United States Environmental Protection Agency (USEPA) guidance provided in EPA 540-R-98-031, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*.

The Army is the Executive Agent on behalf of the Department of the Defense (DoD) charged with meeting all applicable environmental restoration requirements at FUDS, regardless of which DoD component previously owned or used the property. The Secretary of the Army further delegated the program management and execution responsibility for FUDS to the USACE. The USACE is the lead agency for investigating, reporting, evaluating and implementing remedial actions at Tisbury Great Pond.

As the lead agency for remedial activities, USACE is responsible for environmental restoration at the Tisbury Great Pond MRS under the Military Munitions Response Program (MMRP), established in 2001 under the Defense Environmental Restoration Program (DERP). The supporting regulatory agency, Massachusetts Department of Environmental Protection (MADEP), provides regulatory oversight of environmental restoration activities and environmental compliance. Funding is provided by DERP, approved by Congress to investigate and remediate contaminated sites on FUDS.

## 1.3 Assessment of Project MRS

Past military munitions training activities conducted at the Tisbury Great Pond MRS, resulted in MEC contamination within the MRS boundary.

The FUDS property was established in a 21 March 1996 Findings and Determination of Eligibility. In 1996, USACE established the MMRP project in an Inventory Project Report (INPR) (USACE, 1996). The INPR concluded that the property was used as a practice bombing and strafing range. Military practice ordnance potentially used at the MRA included 0.30 and 0.50 caliber ammunition, miniature (3-5 pounds [lbs]) practice bomb series including AN-Mark (MK)5 Mod1, MK23, and MK43; and large (100-500 lbs) practice bomb series including AN MK5, MK15, and AN-MK21. Based on the possibility that ordnance may still be present, the property was determined to be eligible for cleanup under the FUDS program. The Findings and Determination of Eligibility for the site established the eligibility as a FUDS. A MMRP project was proposed and the INPR identified a MEC category hazard potential. The INPR assigned a Risk Assessment Code (RAC) of 2 for the site and recommended further action (USACE, 1996).

In 1997, the USACE prepared an Archive Search Report (ASR) that documented a historical records search and site inspection for ordnance and explosives (OE) presence located at Tisbury Great Pond, Martha's Vineyard, Massachusetts. The purpose of this investigation was to inspect the site for potential OE presence to include conventional ammunition and chemical warfare materiel. The investigation was conducted through the evaluation of historical records, interviews, and on-site visual inspections (USACE, 1999).

A site inspection and historical photographs confirmed the presence of ordnance on 24 acres of land located around the practice bombing and strafing target area. The site inspection team discovered what appeared to be an MK15 series 100-lb sand or water-filled bomb. Additionally, local Shellfish Constables provided a 1992 photograph of items discovered and removed from the pond-side shoreline in this area. Items present in the photographs are MK5 and MK23, 3-lb practice bombs and broken 300-lb general purpose bomb bodies (USACE, 1999). The ASR determined that there was no evidence of chemical warfare storage, usage, or disposal (USACE, 1999).

In 2004, the USACE prepared an ASR Supplement to combine with the information regarding specific munitions presented in the ASR to generate a list of military munitions types and composition for Tisbury Great Pond. The ASR Supplement also assigned a RAC score to the site. RAC score indicates the level of MEC risk associated with a site, where a score of 1 indicates a site with the highest risk and a score of 5 indicates a site with the lowest risk. Tisbury Great Pond received a score of 2. The ASR Supplement established a MRA boundary (USACE, 2004).

In September 2008, a Site Inspection Report (SIR) was prepared to document the site inspection findings at the Tisbury Great Pond. The site inspection was conducted to determine whether further response was necessary at the site. The scope of the investigation was restricted to the evaluation of the presence of MEC or MC related historical use of the property. Activities

associated with this investigation included a records review, qualitative site reconnaissance, and environmental sampling (Alion, 2008).

Between 19 August 2009 and 13 July 2011, VRHabilis, LLC (VRH), Navy EOD, and the Massachusetts State Police Bomb Squad responded to nine emergency calls associated with potential ordnance. Four MEC items were discovered and were destroyed by counter-charging. In addition, munitions debris items were also identified, inspected, determined to be free of explosive hazard, and removed and secured.

A Remedial Investigation (RI) was conducted from 2010-2011 to collect data necessary to determine the nature and extent of potential MEC, Munitions Debris (MD), and Munitions Constituents (MCs) resulting from historical military activities conducted within Tisbury Great Pond MRA. To achieve the RI goals, various field investigative activities were conducted including: geophysical surveying, intrusive investigations, and environmental sampling for analysis of MCs. These activities were conducted within the RI Investigation Area, which extends beyond the boundary of the Tisbury Great Pond MRA.

A Human Health Risk Assessment (HHRA) and a Screening Level Ecological Risk Assessment (SLERA) were performed during the RI, neither of which identified a potential risk to human or ecological receptors associated with MCs. Based on the presence of MEC identified during the RI, a ***MEC Hazard Assessment (HA)*** was performed. Under current conditions, the Tisbury Great Pond MRS received a hazard level category of 1, indicating the highest level of potential explosive hazard conditions are present.

No remedial action was recommended for the Remaining Land and Water MRS since no evidence of concentrated munitions use was identified in this MRS during the RI. A Feasibility Study (FS) was recommended for the Tisbury Great Pond MRS to address the hazards associated with MEC discovered during the RI. No further action was identified associated with MCs at the Tisbury Great Pond MRS since it was determined that no unacceptable risk exists for human health or ecological receptors.

The RI results were used to develop the FS that identified remedial objectives and goals for the Tisbury Great Pond MRS to protect human health and the environment, and evaluate remedial alternatives to address the type and extent of MEC contamination in the Tisbury Great Pond MRS. The analysis in the FS was used to select a remedy, which was documented in a Proposed Plan (PP) finalized in June 2015, and issued with an opportunity for public comment (15 June through 17 July 2015). All public comments received were considered prior to selecting the final remedy. The RI also determined no MEC or MD has been identified in the Remaining Land and Water MRS therefore, no action is proposed for the Remaining Land and Water MRS.

USACE has determined that the response actions selected in this DD for hazards associated with MEC at the Tisbury Great Pond are necessary to protect public health, welfare, or the environment, based on the current and intended future use of the MRS.

## 1.4 Description of the Selected Remedy

The Selected Remedy for the Tisbury Great Pond MRS is Subsurface Clearance. The remedy is based upon the results of field investigations, laboratory analyses, data evaluations, current and future land use, assessments of potential human health and ecological risks, and response actions for MC and MEC respectively at the Tisbury Great Pond MRS. This alternative reduces MEC exposure hazards to the public. Specific components of the Selected Remedy (Tisbury Great Pond MRS Alternative 4 comprising 123.1 acres) include:

- Mobilization;
- Site management;
- Environmental Coordination and Environmental Monitoring;
- Survey and positioning;
- Brush clearing (where needed);
- Dune excavation and sifting/inspection;
- "Mag & dig" within the ocean area (detect the item with a magnetometer and excavate);
- Digital Geophysical Mapping (DGM) and data analysis within the inland water and land areas;
- Anomaly reacquisition and resolution;
- MEC removal/disposal (e.g., Blow In Place [BIP]);
- Material Documented as Safe (MDAS) waste stream (off-site) disposal;
- Site restoration;
- Post construction vegetation monitoring;
- Demobilization;

After all clearance operations are complete, a review of the site will be made (similar to a CERCLA 5 year review) that will ensure the effectiveness of the remedial actions for UU/UE.

Due to the lack of evidence of concentrated MEC use and negligible risk from MC in the Remaining Land and Water MRS, no action is required.

## 1.5 Statutory Determinations

The Selected Remedy consisting of Subsurface Clearance for the Tisbury Great Pond MRS is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions to the maximum extent practicable in accordance with CERCLA §121.

The Selected Remedy represents the maximum extent to which permanent solutions can be used in a practicable manner at the site. The Selected Remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment). It provides the best balance of trade-offs in terms of balancing criteria while also considering state and community acceptance.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300.430[f][4][ii]), requires five-year reviews if the remedial action results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for UU/UE. The Selected Remedy is expected to achieve UU/UE. However, to verify that the selected remedy (1) achieves UU/UE in the lands within the MRS, (2) is protective of human health and the environment, and (3) that restoration of the site has been successful, a review, similar to a statutory five year review will be performed after all planned remediation is complete. Once it is determined that UU/UE was been achieved by the Selected Remedy, the project will be closed out.

For the Remaining Land and Water MRS, none of the CERCLA §121 statutory determinations are necessary.

## 1.6 Data Certification Checklist

The following information is included in the Decision Summary section of this DD. Additional information can be found in the Administrative Record (AR) files for the Tisbury Great Pond MRS, and the Remaining Land and Water MRS:

- **Nature and extent of MEC contamination**: Subsection 2.5.2 – Nature and Extent of MEC.
- **Hazard represented by MEC**: Section 2.7 – Summary of Project MRS Hazards.
- **Remediation objectives**: Section 2.8 – Remedial Action Objectives.
- **How MEC will be addressed**: Section 2.11 – Principal MEC Issues.
- **Current and reasonably anticipated future land use assumptions used in the hazard assessment and DD:** Section 2.6 – Current and Potential Future Land Use.
- **Potential land use that will be available at the site as a result of the Selected Remedy**: Subsection 2.12.4 – Estimated Outcomes of the Selected Remedy.
- **Total present worth costs and the number of years over which the remedy cost estimates are projected:** Section 2.9 – Description of Alternatives.
- **Key factor(s) that led to selecting the remedy**: Section 2.10 – Comparative Analysis of Alternatives, Section 2.12 – Selected Remedy, and Section 2.13 – Statutory Determinations.

## 1.7 Authorizing Signature

This DD documents the selected response action at the Tisbury Great Pond MRA, located in Dukes County, which is within the Town of West Tisbury, Martha's Vineyard, Massachusetts. USACE is the lead agency under DERP at the Tisbury Great Pond MRS and the Tisbury Great Pond Remaining Land and Water MRS, FUDS Property No. D01MA0453, Projects 01 and 02; and has developed this DD consistent with CERCLA, as amended by SARA, and the NCP. This DD will be incorporated into the larger Administrative Record file for FUDS Property No. D01MA0453, Projects 01 and 02, which is available for public view at the West Tisbury Free Public Library, 1042 State Road, Vineyard Haven, MA 02568. This document, presenting the selected remedies with present worth cost estimate of $9,868,000, and $0 for Tisbury Great Pond MRS and the Tisbury Great Pond Remaining Land and Water MRS, respectively, is approved by the undersigned, pursuant to Memorandum, DAIM-ZA, September 9, 2003, subject: Policies for Staffing and Approving DDs, and to Engineer Regulation 200-3-1, FUDS Program Policy.

Approved:

JUN 2 2 2016

KAREN J. BAKER
Chief, Environmental Division
Directorate of Military Programs

Date

# 2. DECISION SUMMARY

This DD has been prepared using the guidance published by the USEPA on preparing remedy selection DDs. Cleanup funding for the implementation of the Selected Remedy will be provided by the Defense Environment Restoration Account, a source of funding approved by the United States (U.S.) Congress to clean up contamination on FUDS installations under the DERP. The USACE is the lead agency for investigating, reporting, making decisions, and taking remedial actions regarding MEC at the MRSs. The Massachusetts Department of Environmental Protection (MADEP) is the lead regulatory agency.

## 2.1 Project Name, Location, and a Brief Description

The Tisbury Great Pond MRA, FUDS Property No. D01MA0453, is located in West Tisbury, Dukes County, Martha's Vineyard, Massachusetts (Figure 2-1). The FUDS acreage is approximately 1082 acres. This acreage was delineated into two MRSs, Tisbury Great Pond MRS (Project 01) comprising 123 acres of contaminated land and inland water, and the Remaining Land and Water MRS (Project 02) comprising 959 acres of uncontaminated land and water.

The land encompassing the Tisbury Great Pond MRS is currently owned by The Trustees of Reservations (TTOR), the Commonwealth of Massachusetts (inland and coastal waters), and private landowners. The land is part of the Massachusetts Coastal Zone and Long Point Wildlife Refuge.

## 2.2 Project MRS History and Enforcement Activities

Between August 1943 and July 1947, the MRA was used as a practice dive bombing and strafing range. The site was utilized to support the U.S. Navy's fighter training program at Quonset Point Naval Air Station, Rhode Island and the Naval Auxiliary Air Station, Martha's Vineyard, Massachusetts. During the initial operational period of the range, strafing and masthead targets were constructed to allow student pilots to develop their gunnery and bombing skills. It is believed that military activities ceased at the site by the end of World War II. On 27 March 1947, the site was reinstated for practice bombing use by the carrier fleet based at Newport, Rhode Island. A masthead target was constructed on the barrier beach south of the pond (UXB, 2011). On 29 July 1947, the commander of the 1st Naval District reported that the Tisbury Great Pond Area was excess to the needs of the U.S. Navy, and the area was closed, the targets were removed, and the area was decontaminated (Alion, 2008).

Military practice ordnance potentially used at the MRS include:

- 0.30 and 0.50 caliber ammunition;
- Miniature practice bombs; AN-MK5, AN-MK23, and AN-MK43; and
- Practice 100-500 lb general purpose bombs; MK15 and MK21 (USACE, 1999).

Records do not indicate that the property was ever used to store, transport, treat, or dispose of associated munitions used on the property. Following site closure and land transfer, Tisbury Great Pond was returned to use as a shellfish harvest area (Alion, 2008).

### 2.2.1 Inventory Project Report

In 1996, the USACE issued an INPR for the Tisbury Great Pond Target Area. The INPR concluded that the property was used as a practice bombing and strafing range. The report stated that only practice bombs were known to be used at the site; including, practice bombs AN-MK23, AN-MK43, MK15, and MK21, and the spotting charge AN-MK4 may have been used with each of these practice munitions. Additionally, small arms including 0.50 caliber wing-mounted munitions were used at the site. Based on the possibility that ordnance may still be present, the property was determined to be eligible for cleanup under the FUDS program. The Findings and Determination of Eligibility for the site established the eligibility of 514 acres as a FUDS. A MMRP project was proposed and the INPR identified a MEC category hazard potential. The INPR assigned a RAC of 2 for the site and recommended further action by the United States Army Engineering Support Center, Huntsville (USAESH) (USACE, 1996).

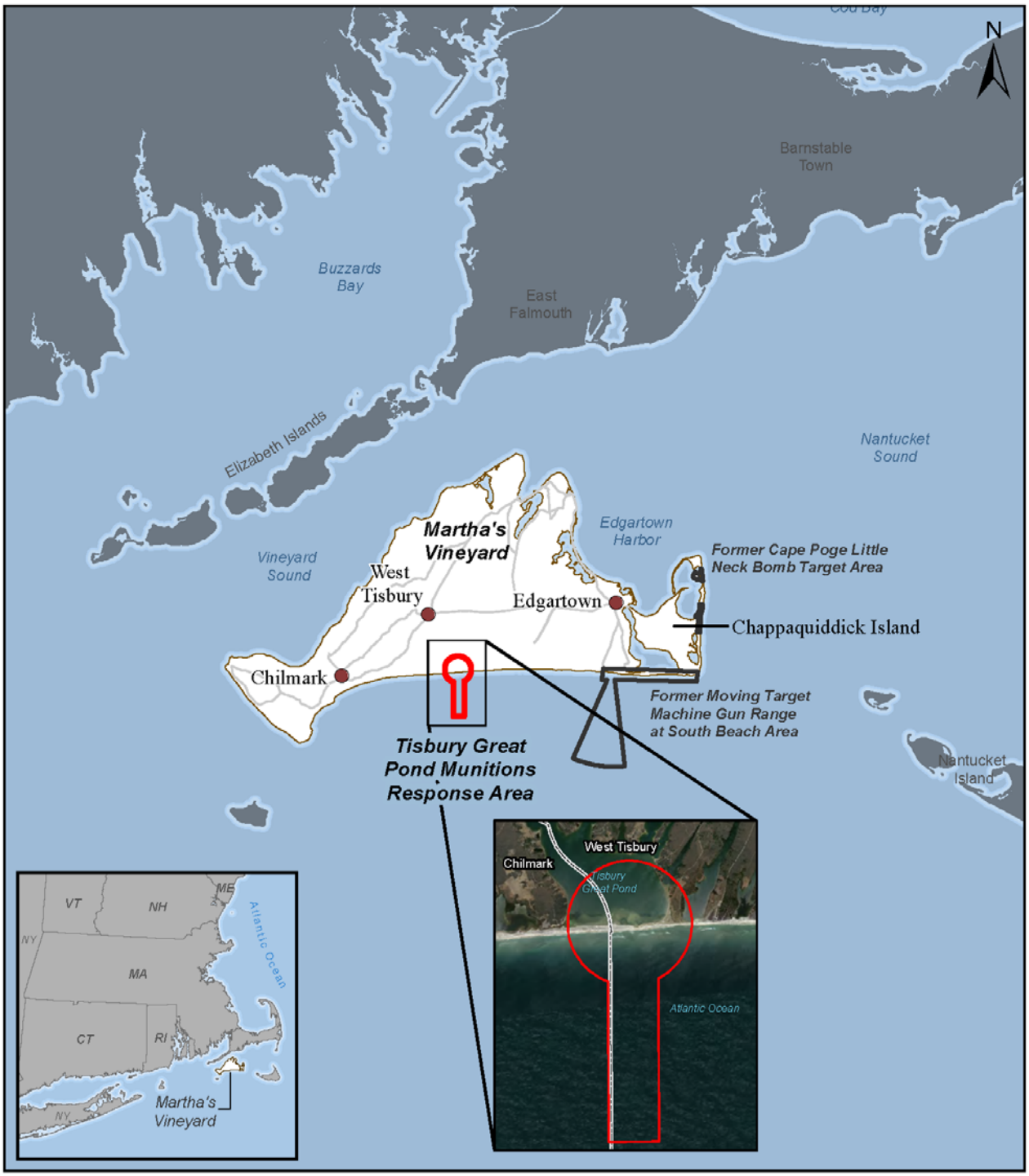
### 2.2.2 Archives Search Report

In 1997, the USACE prepared an ASR that documented a historical records search and site inspection for OE presence located at Tisbury Great Pond, Martha's Vineyard, Massachusetts. The purpose of this investigation was to characterize the site for potential OE presence to include conventional ammunition and chemical warfare materiel. The investigation was conducted through the evaluation of historical records, interviews, and on-site visual inspections (USACE, 1999).

Interviews conducted indicate that no explosions were heard during practice bombings, the flight lines were north to south (Tisbury Great Pond to ocean), and multiple residents found various types of practice bombs in and along Tisbury Great Pond. One of the original landowners, Deloris Bissell Bigelow, requested a cleanup from the Navy of the metal debris on her 11.1-acre property after it was returned.

A site inspection and historical photographs confirmed the presence of ordnance on 24 acres of land located around the practice bombing and strafing target area. The site inspection team discovered what appeared to be an MK15 series 100-lb sand or water-filled bomb. Additionally, local Shellfish Constables provided a 1992 photograph of items discovered and removed from the pond-side shoreline in this area. Items present in the photographs are MK5 and MK23, 3-lb practice bombs and broken 300-lb general purpose bomb bodies (USACE, 1999). The ASR determined that there was no evidence of chemical warfare storage, usage, or disposal (USACE, 1999).

1




US Army Corps of Engineers

**FIGURE 2-1**
Site Location - Martha's Vineyard, MA

0 2.5 5 10 15 Miles
0 5 10 15 20 25 Kilometers

UXB amec

NOTES:
Base map data source: ESRI

| | | | |
|---|---|---|---|
| 10/16/2014 | Rev: | Tisbury_MV_Island_Remedial_Inv_Rpt.mxd |
| Drawn: JBO | Chk: DMS | PROJ: 562910000 |

### 2.2.3 Archives Search Report Supplement

In 2004, the USACE prepared an ASR Supplement to combine with the information regarding specific munitions presented in the ASR to generate a list of military munitions types and composition for Tisbury Great Pond. USACE technical documents, manuals, and other resources were used to identify a list of MCs associated with each munitions type. The report indicated that the associated MCs include nitroglycerin (NG), 2,4-dinitrotoluene (2,4-DNT), 2,6-dinitrotoluene (2,6-DNT), 2,4,6-trinitrotoluene (2,4,6-TNT) and its degradation compounds 2-amino-4,6-dinitrotouene and 4-amino-2,6-dinitrotoluene and the metals antimony, copper, iron, lead, nickel, strontium and zinc.

The ASR Supplement also assigned a RAC score to the site. RAC score indicates the level of MEC risk associated with a site, with a score of 1 indicating a site with the highest risk and a score of 5 indicating a site with the lowest risk. Tisbury Great Pond received a score of 2. The ASR Supplement established a MRS boundary (USACE, 2004).

### 2.2.4 Site Inspection Report

In September 2008, a Site Inspection Report (SIR) was prepared by Alion to document the site inspection findings at the Tisbury Great Pond. The site inspection was conducted to determine whether further response was necessary at the site. The scope of the investigation was restricted to the evaluation of the presence of MEC or MC related historical use of the property. Activities associated with this investigation included a records review, qualitative site reconnaissance, and environmental sampling (Alion, 2008).

A qualitative site reconnaissance was conducted on January 29, 2008 on approximately 4.49 acres of land and water. During the reconnaissance, analog geophysics was conducted and visual observations were made. The field sampling approach included magnetometer-assisted reconnaissance following a meandering path in and around sampling locations to confirm the location of the practice bombing and strafing targets and identify whether MEC, munitions debris (MD), or other areas of interest were present. During the reconnaissance, one underwater anomaly was observed in the eastern portion of the pond and one subsurface anomaly was detected. These anomalies were not investigated since they were not visible from the surface.

A qualitative Screening Level Ecological Risk Assessment (SLERA) was also conducted for MEC identified at Tisbury Great Pond (Alion, 2008). This assessment was based on results and findings from the site inspection qualitative reconnaissance, the INPR, ASR, and the ASR Supplement. The potential risk posed by MEC was based on three factors, including the presence of a MEC source, accessibility or pathway presence, and potential receptors. Based on the available information, the site was given a low-to-moderate risk. Finally, MC sampling and risk screening was conducted for the site. MC sampling included six discrete surface soil sample locations, two background surface soil sample locations, one discrete subsurface soil sample location, five

sediment sample locations, and two background sediment sample locations. These samples were located on the beach near Long Cove Point, in the vicinity of the practice ranges, and along the shoreline of the pond. The samples were analyzed for associated explosives and metals. The human health screening did not identify any Chemicals of Potential Concern for the environmental media sampled. Based upon the SLERA, antimony and lead in surface soil and strontium in surface water were identified as Chemicals of Potential Ecological Concern. Only antimony and lead in surface soil were determined to be present at potentially unacceptable risks to ecological receptors. The SIR recommended an RI/FS (Alion, 2008).

### 2.2.5 Emergency Response

Between 19 August 2009 and 13 July 2011, VRH, Navy EOD, and the Massachusetts State Police Bomb Squad responded to nine emergency calls associated with potential ordnance. Four MEC items were discovered and were destroyed by counter-charging. In addition, munitions debris items were also identified, inspected, determined to be free of explosive hazard, and removed and secured. The details of the emergency responses are presented in Table 2-1.

**Table 2-1. Emergency Responses at the Tisbury Great Pond Area**

| Date | Location | Quantity | Ordnance Description | Response Action |
|---|---|---|---|---|
| 24-02-2009 | Long Point | 1 MEC | UXO item – 100 lb bomb fragment found by beach walker | Navy EOD destroyed the item by counter charging.* |
| 24-04-2009 | Long Point | 1 MEC | UXO item – suspect 100 pound HE bomb found at Long Point wildlife Refuge, W. Tisbury Great Pond | Navy EOD, State Police Bomb Squad destroyed the item by counter charging.* |
| 19-08-2009 | Long Point | 1 MEC | UXO item at the West Tisbury Great Pond "cut." Nose fuse was visible, but the rest of the item was indiscernible. Determined to be potentially hazardous. | Navy EOD destroyed the item by counter charging. Navy EOD reported that item was a high explosive round.* |
| 20-08-2009 | Tisbury Great Pond | 1 Potential MEC | Potential UXO item at the West Tisbury Great Pond "cut" during sweep ahead of President Obama visit. | Due to high tide and strong currents, item was left in place; disposition on 24-08-2009 response |
| 24-08-2009 | Tisbury Great Pond | Multiple MD, 1 MEC | State Bomb Squad collected about 200 pounds of bomb fragments and sections. The largest fragment (approximately 30 pounds in size) probably contained flash powder according to the tech who blew it. | State Police Bomb Squad detonated them in two separate blasts around 8:30 PM. |
| 23-02-2011 | Tisbury Great Pond | 3 MD | Metal debris found in the vicinity of the cut. Determined to be munitions debris with no explosive hazard. | Removed and placed in a secure container in Edgartown. |
| 24-02-2011 | Tisbury Great Pond | 3 MD | Metal debris found in the vicinity of the cut. Determined to be munitions debris with no explosive hazard. | Removed and placed in a secure container in Edgartown. |
| 26-02-2011 | Tisbury Great Pond | 2 MD | Metal debris found in the vicinity of the cut. Determined to be munitions debris with no explosive hazard. | Removed and placed in a secure container in Edgartown. |

| Date | Location | Quantity | Ordnance Description | Response Action |
|---|---|---|---|---|
| 13-7-2011 | Long Point | 6 MD | Metal debris found on the beach. Two of the items were identified as munitions debris; items inspected and no explosive hazard related to the items found. | The debris was removed and disposed. |

**Notes:**
EOD – Explosives Ordnance Disposal
* Due to the mission of the EOD to render items safe by detonation (as opposed to perforating the items to first determine whether the items contain explosives) coupled with the large amount of explosives used by the EOD team, USACE concluded that the resulting explosion of an item during detonation cannot be used to validate if an item was MD or MEC based on the resulting explosion during detonation.

### 2.2.6 Remedial Investigation/Feasibility Study

An RI, completed in accordance with the NCP (40 CFR 300.430[d] and [e]), was initiated in 2009 and concluded in 2014. The RI field work was conducted to characterize the nature and extent of MEC and MC of the Tisbury Great Pond MRA. The sources of data evaluated as part of the RI to characterize contamination at this MRA included historical information and archival searches, results of the RI field effort, site layouts based on historical maps and photos, and the visual inspection of terrain and structures. The data collected during the field investigation and the conclusions drawn in the *Tisbury Great Pond Investigation Area Remedial Investigation Report,* regarding hazards to human health and the environment were used to develop the Feasibility Study (FS), which was finalized in June 2015.

The objective of the RI, to delineate the nature and extent of MEC and MC impacted from historic training activities conducted at the Tisbury Great Pond MRA, was achieved. RI activities including geophysical surveying, MEC intrusive investigations, and environmental sampling for analysis of MCs was conducted within land, beach, inland water, and ocean sub-areas.

Key findings of the RI included:

- 8 MEC items (practice bombs with spotting charges), 31 MD items and 254 non-MD items were identified.
    - The beach, inland water, and ocean near the "Cut" contained the highest concentration of MEC and MD items.
    - 3 MEC items were identified within the northwest portion of Tisbury Great Pond (outside of the MRA boundary). The MEC items were all recovered in a single grid and consisted of three MK23s co-located in one hole. This fact coupled with the distance from the historic target and other MK23 finds indicates it is likely they were secondarily transported via human activity.
    - The land area east of Tisbury Great Pond contained 1 MEC item and no MD items. Considering the distance from the historic bombing target and that no other MEC or MD items were observed in the adjacent areas, it is unlikely that other MEC items are located in this area.

- Emergency Responses
  - 4 MEC items were identified during emergency response and included:
    - A UXO (100 pound bomb fragment) was found on 24 February 2009 and destroyed by Navy EOD
    - A UXO (unknown bomb) found at Long Point wildlife Refuge, W. Tisbury Great Pond on 24 April 2009 and destroyed by Navy EOD and State Police Bomb Squad
    - A UXO (unknown bomb) determined to be filled with high explosives by EOD was identified/destroyed 08 August 2009 west of the current "Cut."
    - One suspect UXO item was identified during an emergency response at the West Tisbury Great Pond "cut" on 20 August 2009. It was subsequently recovered and destroyed by Navy EOD on 24 August 2009
  - MD items were identified in 5 instances on the beach near the "Cut." Multiple items (200 pounds) on 24 August 2009; 3 on 23 February, 3 on 24 February, 2 on 26 February, and 6 on 13 July 2011.
- During the Transport Acoustic Transponder (Pinger) Survey a spotting charge simulant was transported laterally/parallel to the beach in nearshore currents and 100-lb bomb simulants were identified at the location where they were placed but were buried under 8-inches of sand, which indicates the strong coastal movement of the waves and ocean on munitions in this area.
- MC Sampling
  - MC sampling indicated that human health screening criterion were not exceeded in any media.
  - No high explosive compounds or their by-products were detected in soil; therefore, none of these compounds pose a potential risk to ecological receptors resources at this site.
  - None of the key metals (antimony, copper, lead, nickel, and zinc) occur in soil at levels that exceed MADEP-specified background concentrations; therefore, all are consistent with a condition of No Significant Risk based on the MCP Method I Standards.
  - Lead levels in surface soil exceeded the ecological soil screening levels for insectivorous birds; however, further evaluation of conservative assumptions indicated that the potential for risk from this metal is negligible.

- Although the concentrations of lead and nickel in surface sediment from Tisbury Great Pond exceeded the USEPA Region 3 ecological screening levels for those metals, their potential for risk was found to be insignificant based on the 95% upper confidence level concentrations. In addition, background sediment concentrations also exceeded the USEPA Region 3 ecological screening levels for lead and nickel.

Based upon the RI results, it was recommended that no change be made to the MRA boundary established during the ASR Supplement (USACE, 2004). The boundary includes the extent of MEC determined through previous investigations and geophysical and intrusive investigation data. It was also recommended that Tisbury Great Pond MRA be subdivided into two MRSs, comprising the Tisbury Great Pond MRS (123 acres) and the Remaining Land and Water MRS (959 acres) (Figure 2-2). Figure 2-2 also delineates an area within the Tisbury Great Pond MRS where access is currently restricted due to property owner refusal to grant USACE a Right of Entry (ROE). Based upon the information gathered from historical records, previous investigations, and RI results, a FS was recommended to evaluate future response action alternatives with regard to MEC hazards at the Tisbury Great Pond MRS. No MEC was found in the Remaining Land and Water MRS, and no further evaluation of MC was warranted in either of the MRSs.

The FS presents a detailed analysis of remedial alternatives where the strengths and weaknesses of the remedial alternatives relative to one another were evaluated with respect to each of the NCP criteria. This approach to analyzing alternatives is designed to provide decision-makers with sufficient information to adequately compare the alternatives, select an appropriate remedy for the MRSs, and demonstrate satisfaction of meeting the CERCLA remedy selection requirements for this DD.

The results of the FS were presented in the *Final Feasibility Study, Tisbury Great Pond MRA* and summarized in the *Final Proposed Plan, Tisbury Great Pond MRA*. As required by the NCP [40 CFR 300.800(a)], both technical documents are on file as part of the AR. No CERCLA enforcement activities have been required at the site.

## 2.3 Community Participation

Throughout the RI/FS process, community participation has been solicited in several ways, including a Public Involvement Plan (PIP), fact sheets, public notices, and public meetings. The PIP completed in January 2011 provides information regarding the USACE's planned community relations activities.

A summary of the community participation process is provided in the Responsiveness Summary, which is included as a component of this DD (see Section 3). Pursuant to CERCLA Section 113(k)(2)(B) and Section 117, and Section 300.430(f)(2) and (3) of the NCP, the PP for the Tisbury Great Pond MRS and the Remaining Land and Water MRS was released for public comment on 15 June 2015. The PP and the RI/FS reports are available to the public in the Information

Repository, located in the West Tisbury Free Public Library, 1042 State Road, Vineyard Haven, MA 02568; (508)-693-3366.

The public comment period was 15 June to 27 August 2015. Comments were received by USACE during this time. A public meeting was held on 23 June 2015 at the West Tisbury Free Public Library, 1042 State Road, Vineyard Haven, MA 02568, to present the PP, to answer questions, and solicit comments from the public. USACE and its' contractor, TTOR, and MADEP attended the meeting. The notification for the PP meeting and public comment period was published in the following:

- Cape Cod Times

  Tisbury Great Pond Public Notice - Sunday, 14 June 2015

- Martha's Vineyard Times

  Tisbury Great Pond Public Notice - Thursday, 18 June 2015

- Vineyard Gazette

  Tisbury Great Pond Public Notice - Friday, 19 June 2015.

## 2.4 Scope and Role of Response Action

This DD authorizes the Selected Remedy to address MEC contamination at the Tisbury Great Pond MRS. The Selected Alternatives consist of subsurface clearance up to approximately 3-foot (ft) depth in soil and sediment on the beach and inland water, and from 3 ft to possibly 6 ft under the base of the dune at the Tisbury Great Pond MRS as delineated on Figure 2-2. The purpose of the remedial action is to reduce the hazard associated with MEC to human health and the environment based on the current and intended future land use of public access for recreational and commercial activities.

## 2.5 Project MRS Characteristics

The following information is presented to document the site characteristics of the Tisbury Great Pond MRA. Detailed information about the MRA characteristics, the site conceptual model, and the nature and extent of contamination is presented in the *Final Remedial Investigation Report Tisbury Great Pond Investigation Area*.

1 **Figure 2-2. Site Map**

### 2.5.1 Environmental Setting

#### 2.5.1.1 Climate

Martha's Vineyard has a temperate marine climate. Although Martha's Vineyard's weather is typically moderate, there are occasions where the island experiences extreme weather conditions such as blizzards and hurricanes. Martha's Vineyard generally experiences a delayed spring season, being surrounded by an ocean that is still cold from the winter; however, it is also known for an exceptionally mild fall season, due to the ocean remaining warm from the summer. The highest temperature ever recorded on Martha's Vineyard was 99 degrees Fahrenheit in 1948, and the lowest temperature ever recorded was -9 degrees Fahrenheit in 1961.

Precipitation on Martha's Vineyard and the Islands of Cape Cod and Nantucket is the lowest in the New England region, averaging slightly less than 40 inches per year. This is due to storm systems that move across western areas, build up in mountainous regions, and dissipate before reaching the coast.

#### 2.5.1.2 Topography

The topography of the Tisbury Great Pond MRS is relatively flat with sand dunes, which range in height from approximately 5 to 10 ft. Elevations range from sea level to approximately 3 ft above mean sea level (msl) near the southern coastline to approximately 15 ft above msl in the northern portion of the site. There is a barrier beach that separates Tisbury Great Pond (a brackish pond) from the Atlantic Ocean. On occasion, the barrier beach is breached by storm events. In addition, the Town Sewers breach the beach several times a year to hydraulically connect the pond to the ocean to allow the pond to discharge freshwater to the Atlantic Ocean and allow saltwater enter the pond. The breach (also known as "the Cut") closes naturally after each of these events. The breach locations started on the western edge of the pond and move eastward with each successive breach east of the previous one. The most recent breaches have cut through the dune on the eastern edge of the pond.

#### 2.5.1.3 Soil Conditions

The soils at the MRS consist of beaches, Udipsamments, Carver loamy coarse sand, Riverhead sandy loam, and Eastchop loamy sand; and the low lying soils Barryland loamy sand and Pompton sandy loam (United States Department of Agriculture – Soil Conservation Service [USDA-SCS], 1986). Descriptions of the soils located at various locations within the MRS are provided below.

Soils at the barrier beach consist of beach areas and Udipsamments soils, which are found near the coast. Both soils consist of deep sand of various texture that have rapid to very rapid permeability. Due to the continuous washing and rewashing by waves, beach areas typically do not have plant cover. Most areas of Udipsamments have a cover of grasses and shrubs. The beaches nearest the

ocean are inundated twice daily by tides. The entire beach is generally flooded by spring tides and storm tides (USDA-SCS, 1986).

Soils located adjacent to Tisbury Great Pond primarily consist of Carver loamy coarse sand and Riverhead sandy loam, with a smaller area of Eastchop loamy sand located on the western shore of the pond. These soils are very deep and range from well to excessively drained. All three soils are found on outwash plains and consist of sandy loam, loamy sand, or loamy coarse sand over coarse sand. Permeability of these soils ranges from rapid to very rapid. The depth to seasonal high water table is greater than 6 ft below ground surface (bgs) (USDA-SCS, 1986).

Two smaller soil units, based on aerial extent, located within the MRS are the Barryland loamy sand and Pompton sandy loam. These soils are located along Thumb Cove and Tisbury Great Pond. These soils are very deep and are generally poorly drained. Both soils are found in closed depressions, at the base of swales, in low areas that border ponds and swamps, and in drainage ways. The Barryland and Pompton soils consist of sand and loamy sand, respectively. These soils have moderate to rapid permeability. The Barryland soil (located along Thumb Cove) has a seasonal high water table at or near ground surface in the fall, winter, and spring. Water is ponded in the surface in some areas. The Pompton soil (located along the Tisbury Great Pond) has a seasonal high water table at a depth of 1 to 2 ft bgs (USDA-SCS, 1986).

#### 2.5.1.4 Geology

The MRSs and the Island of Martha's Vineyard are relics of the last ice age and the warming trends that followed. Repeated glaciations scraped soil and rock from the mainland of New England. Eighteen-thousand years ago, the glaciers reached their southernmost extent and began to melt and retreat, depositing the rock, sand, and other materials, once trapped within the ice, as terminal moraines. These terminal moraines can be found on Martha's Vineyard.

The geological deposits that make up the site consist of recent beach and marsh sediments, glacial deposits, interglacial deposits, and glacially deformed ancient coastal plain sediments. The county consists mostly of deposits from the last glacial stage, but in places consists of glacial or interglacial deposits as much as 300,000 years old. These deposits overlie solid bedrock and range from approximately 500 ft thick on the north shore of Martha's Vineyard to 900 ft thick on the south shore. The bedrock consists of metamorphic rocks, such as schist and gneiss, and igneous rocks.

#### 2.5.1.5 Surface Water Hydrology

Tisbury Great Pond is a salt-water pond approximately 735 acres in size and up to 20 ft deep that fills with fresh water runoff received from an 11,000-acre watershed. Several times a year, a channel is excavated to hydraulically connect the pond to the Atlantic Ocean, recharging the salinity and lowering the pond water level. The water quality of the pond is considered to be impaired due to low dissolved oxygen in deep water and elevated nitrogen levels. In addition to

the planned openings, natural breaches occur as a result of storm events. Regardless of whether the breach is man-made or natural, it closes naturally after several days to several weeks. The man-made cuts progress west to east, and each cut is moved sequentially to the east. This action allows 3 to 4 ft of water to drain back to the ocean. The channel is opened on an "as needed" basis (USACE, 1999).

#### 2.5.1.6 Groundwater Hydrology

Groundwater at the MRS occurs predominately in the unconsolidated and moderately consolidated glacial till material, which derive their water from local precipitation. Bedrock is much less permeable than the overlying sediments, commonly contains seawater, and is not considered to be part of the aquifers of Martha's Vineyard (USAESCH, 2010).

Groundwater is encountered at the MRS at a depth ranging from 1 to 2 ft bgs. The water table generally mimics topography and is weakly influenced by tidal fluctuations. Groundwater quality studies indicate that salt water intrusion occurs along the coastline and to a lesser degree, throughout the interior of the island. The shallow freshwater aquifer is underlain by brackish groundwater that is unsuitable for human consumption (USACE, 2009). Groundwater flow direction within the Tisbury Great Pond watershed generally trends to the south or toward the pond (Alion, 2008). Groundwater in Martha's Vineyard is primarily discharged directly to the ocean and surrounding bays (USACE, 2009).

In general, supplies of water for homes, cooling, and small businesses can be developed in most areas of outwash from wells that are 1.5 to 2 inches in diameter with 3 ft of screen set about 10 ft below the water table. According to the MADEP, Public Water Supply and Wellhead Protection Areas database, there are approximately 12 public water supply wells within 4 miles of Tisbury Great Pond (Alion, 2008).

#### 2.5.1.7 Sensitive Species, Environments, and Environmental Resources

The current MRA includes four habitat types: 1) upland habitat; 2) inland water, 3) beach; and 4) ocean. These areas provide habitat to a variety of terrestrial plants, invertebrates, and wildlife as well as freshwater, estuarine, and marine organisms. The eastern portion of the MRA includes the TTOR Long Point Reservation, an open space area designated for conservation. The upland portions of the MRA are part of the sandplains habitat of Martha's Vineyard that originally supported a grassland or open woodland vegetation dominated by little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), Indian grass (*Sorghastrum nutans*), and other species of grasses, sedges, and forbs. Dominant trees of this habitat included scrub oak (*Quercus ilicifolia*) and pitch pine (*Pinus rigida*) (United States Fish and Wildlife Service [USFWS], 1991). Various human disturbances, including agricultural and residential development, have modified or removed this natural vegetation type over some of the Investigation Area. Poison ivy (*Toxicodendron radicans*), beach plum (*Prunus maritima*), and bayberry (*Myrica pensylvanica*)

are common throughout the area. Most of the upland area surrounding Tisbury Great Pond has been designated as Core Habitat and Critical Natural Habitat under BioMap2 (Massachusetts Division of Fisheries and Wildlife [MDFW], 2012). The beach habitat includes large areas of unvegetated beach face backed by dunes supported by American beach grass (*Ammophila breviligulata*), seaside goldenrod (*Solidago sempervirens*), and other species adapted to coastal sand environments.

Tisbury Great Pond provides habitat for shellfish, including the American oyster (*Crassostrea virginica*) and soft-shell clam (*Mya arenaria*) (Howes et al., 2013). Oyster populations appear to be rebounding after a disease first detected in 1999 (Culbert. 2001) decimated the fishery. Restoration efforts have been led by the towns of West Tisbury and Chillmark, the Commonwealth of Massachusetts, and the Nature Conservancy. The pond also supports a blue-claw crab (*Callinectes sapidus*) fishery.

Tisbury Great Pond also supports a productive finfish community. Opening the pond allows alewives, an anadromous species, to enter and spawn in the upper estuary. Striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), white perch (*Morone americana*), and American eel (*Anguilla rostrata*) also occur in the pond. Recreational fishing is popular along the beach and the cut channel.

Historical aerial imagery and anecdotal information suggest that eelgrass (*Zostera*) was once well established in the pond. The pond currently supports only scattered patches of eelgrass. Loss of eelgrass is thought to be related to poor water quality caused by nutrient (nitrogen) enrichment (Howes, 2013).

The MRA is mapped as "Core Habitat" and "Critical Natural Landscape" by the Massachusetts Natural Heritage Endangered Species Program (MA NHESP) BioMap2 town report for Edgartown (MA NHESP, 2012). Core habitat identifies areas that are critical to long-term persistence of rare species in Massachusetts. Critical Natural Landscape encompasses habitat used by wide ranging species (e.g. tern), large areas of contiguous habitat, and buffer habitat. The MRA is within Core Habitat area 102 and Critical Natural Landscape area 45.

The MRA has been designated as a Priority Habitat (PH) of Rare Species and Estimated Habitats of Rare Wildlife in the Massachusetts Natural Heritage Atlas 13th Edition (effective October 1, 2008). Habitat alteration within areas mapped as PHs may result in a take of a state-listed species, and is subject to regulatory review by the MA NHESP. PH maps are based on known occurrence of rare species and habitat considerations. The MRA is mapped as PH 15. Based upon coordination with the USFWS, National Atmospheric and Oceanic Administration - National Marine Fisheries Service (NOAA NMFS), and MA NHESP; there are approximately 38 federal/state threatened, endangered, and/or special concern species that could be present on Martha's Vineyard (Table 2-2).

## Table 2-2. Endangered, Threatened, and Special Concern Species
## Tisbury Great Pond MRS

| Common Name | Scientific Name | State Status | Federal Status |
|---|---|---|---|
| **Birds** | | | |
| Common Tern | *Sterna hirundo* | Special Concern | -- |
| Roseate Tern | *Sterna dougallii* | Endangered | Endangered |
| Least Tern | *Sterna antillarum* | Special Concern | -- |
| Northern Harrier | *Circus syneus* | Threatened | -- |
| Piping Plover | *Charadrius melodus* | Threatened | Threatened |
| **Reptiles** | | | |
| Green Sea Turtle | *Chelonia mydas* | Threatened | Threatened |
| Leatherback Sea Turtle | *Dermochelys coriacea* | Endangered | Endangered |
| Loggerhead Sea Turtle | *Caretta* | Threatened | Threatened |
| Kemp's Ridley Sea Turtle | *Lepidochelys kempi* | Endangered | Endangered |
| **Insects** | | | |
| Northeastern beach tiger beetle | *Cicindela dorsalis* | Endangered | Threatened |
| Chain dot Geometer | *Cingulia cateraria* | Special Concern | -- |
| Coastal Heathland Cutworm | *Abagrotis nefascia* | Special Concern | -- |
| Gerhard's Underwing Moth | *Catocala Herodias gerhardi* | Special Concern | -- |
| Faded Grey Geometer | *Stenoporpia Polygrammaaria* | Threatened | -- |
| Pine Barrens Zale | *Zale sp l nr lunifera* | Special Concern | -- |
| Pink Sallow Moth | *Psectraglea carnosa* | Special Concern | -- |
| Sandplain Euchaena | *Euchlaena madusaria* | Special Concern | -- |
| Barrens Buckmoth | *Hemileuca maia* | Special Concern | -- |
| Melsheimer's Sack Bearer | *Cicinus Melsheimeri* | Threatened | -- |
| Pine Barrens Lycia | *Lycia ypsilon* | Threatened | -- |
| Coastal Swamp Metarranthis Moth | *Metarranthis pilosaria* | Special Concern | -- |
| Slender Clearwig Sphinx Moth | *Henaris pilosaria* | Special Concern | -- |
| Spartina Borer Moth | *Spartiniphagia inops* | Special Concern | -- |
| Imperial Moth | *Eacles imperialis* | Threatened | -- |
| Barrens Metarranthis Moth | *Metarranthis apiciaria* | Endangered | -- |
| Comet Darner | *Anax longippes* | Special Concern | -- |
| Purple Tiger Beetle | *Cicindela purpurea* | Endangered | -- |
| Three-Lined Angle Moth | *Digrammia eremiata* | Threatened | -- |
| **Plants** | | | |
| Sandplain gerardia | *Agalinus acuta* | Endangered | Endangered |
| Bristly Foxtail | *Setaria parviflora* | Special Concern | -- |
| Bushy Rockrose | *Crocanthemum dumosum* | Special Concern | -- |
| Purple Needlegrass | *Aristida purpurascens* | Threatened | -- |
| Sandplain Flax | *Linum intercursum* | Special Concern | -- |
| Saltpond Pennywort | *Hydrocotyle verticellata* | Threatened | -- |

| Common Name | Scientific Name | State Status | Federal Status |
|---|---|---|---|
| Pygmyweed | *Tillacea aquatica* | Threatened | -- |
| Sandplain Blue-eyed grass | *Sisinchium fuseatum* | Special Concern | -- |
| Nantucket Shadbush | *Amelanchier nantuckensis* | Special Concern | -- |
| Sea-Breach Knotweed | *Polygonum glaucum* | Special Concern | -- |

**Notes:**
This list was obtained from the RI Work Plan.
-- Status not listed.

Table 2-3 summarizes the observed species found within the MRA. These include piping plover (*Charadrius melodus*), a federally threatened species which may utilize beach and nearby upland habitat, the federally endangered roseate tern (*Sterna dougallii*), the Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), the sandplain gerardia, a plant, and four federally listed sea turtle species and blue crabs which may utilize nearshore ocean habitat. Sea turtles occur seasonally off the coast of Martha's Vineyard from June through early November of any year. While they may occur near shore off Tisbury Great Pond, they are likely to occur in the offshore MRS only briefly as transients. State listed species include many insect and plant species which may utilize upland coastal sandplain or beach habitat.

### 2.5.2 Nature and Extent of Munitions and Explosives of Concern

During the RI, 8 MEC items, 31 MD items, and 254 non-MD items were identified. Recovered items included intact and expended AN-MK23 3-lbs practice bombs and remnants 100-lbs practice bombs. Within the Tisbury Great Pond MRS, the beach, inland water, and ocean near the "Cut" contained the highest concentration of MEC and MD items.

Three MEC items were identified within the northwest portion of Tisbury Great Pond (outside of the MRA boundary). The MEC items were all recovered in a single grid and consisted of three MK23s co-located in one hole. This fact coupled with the distance from the historic target and other MK23 finds indicates it is likely they were secondarily transported via human activity. The land area east of Tisbury Great Pond contained one MEC item and no MD items. Considering the distance from the historic bombing target and that no other MEC or MD items were observed in the adjacent areas, it is unlikely that other MEC items are located in this area.

**Table 2-3. Observed Species within Tisbury Great Pond MRA**

| Species | Federal Threatened and Endangered Species? | Massachusetts Threatened and Endangered Species? | Found Within FUDS MRS? | Found On Martha's Vineyard? | Comment | Reference |
|---|---|---|---|---|---|---|
| Piping plover (Charadrius melodus) | Yes | Yes | Yes | Yes | Two piping plovers were observed by Biodiversity Works during RI fieldwork | Correspondence, Biodiversity Works, April 2011 |
| Roseate Tern (Sterna dougallii) | Yes | Yes | Yes | Yes | MA NHESP has recorded nesting of protected tern species along the Tisbury Great Pond barrier beach to the west of Long Point to the western end on the private properties controlled by the Quansoo Beach Association | Personal communication, Tim Simmons, MA NHESP 5 (2010) |
| Common Tern (Sterna hirundo) | No | Yes | Yes | Yes | In 2010 a tern colony, Common and Least, were recorded nesting along the beach/dunes of Tisbury Great Pond barrier beach. | Chapter 7.0 Environmental Protection Plan, Final RI Work Plan (2011) |
| Least Tern (Sterna antillarum) | No | Yes | Yes | Yes | | |
| Northeastern beach tiger beetle (NEBTB) (Cicindela dorsalis) | Yes | Yes | Yes | Yes | NEBTB occurs on the sandy beaches, washover areas and blowouts of the Tisbury Great Pond MRS. | Chapter 7.0 Environmental Protection Plan, Final RI Work Plan (2011) |
| Gerardia Sandplain (Agalinus acuta) | Yes | Yes | Yes | Yes | Sandplain gerardia has been located only at the Tisbury Great Pond MRS, east of Long Cove Pond. | USFWS Response Letter, September 27, 2010 |

During the RI, there were four emergency responses where MD items were identified on the beach near the "Cut," three on 23 February, three on 24 February, two on 26 February, and six on 13 July 2011. Prior to the RI, VRH, Navy EOD, and the Massachusetts State Police Bomb Squad responded to five additional emergency calls associated with potential ordnance. Four MEC items were discovered and were destroyed by counter-charging. In addition, munitions debris items were also identified, inspected, determined to be free of explosive hazard, and removed and secured as summarized in Table 2-1.

## 2.6 Current and Potential Future Land Use

Currently, the site is owned by TTOR, the Commonwealth of Massachusetts (inland and coastal waters), and private landowners. The land is part of the Massachusetts Coastal Zone and Long Point Wildlife Refuge. When military use of the property ended, Tisbury Great Pond was returned to use as a shellfish harvest area. Today the site is a designated shellfish fisheries area and is actively harvested for oysters, clams, and fish. Private landowners own small portions of the property for recreational use. The majority of the barrier beach at the southern end of the pond is privately owned. It is anticipated that the future land use will remain the same. It is also anticipated that erosion and future loss of the barrier beach will continue.

## 2.7 Summary of Project MRS Hazards

The results of the RI were used to evaluate potential hazards associated with MC and MEC. Based on the risk assessments completed in the RI, MCs, including metals and explosive compounds, were not detected at concentrations that pose an unacceptable risk to human health or the environment. Therefore, the only hazard considered at the Tisbury Great Pond MRS is a hazard associated with MEC. An explosive hazard is the probability for a MEC item to detonate and potentially cause harm. An explosive hazard exists if a person can come into contact with a MEC item that potentially can detonate. The potential for explosive hazard depends on the presence of three critical elements: a source (presence of MEC), a receptor (person), and interaction between the source and receptor (such as picking up the item or disturbing the item). There is no explosive hazard if any one element is missing.

The **exposure pathway** for a MEC item to a receptor is primarily through direct contact because of some human activity. Agricultural or construction activities, as well as shell fishing involving subsurface intrusion are examples of human activities that will increase the likelihood for direct contact with buried MEC. MEC will tend to remain in place unless disturbed by human or natural forces, such as wave action or dune erosion.

## 2.8 Remedial Action Objectives

The Remedial Action Objective (RAO) for Tisbury Great Pond MRS 1 is to reduce the unacceptable probability of MEC encounter at the MRS such that a negligible probability of encounter can be supported for recreational users, landowners, visitors, and workers conducting activities such as boating, fishing, periodic excavation of beach to open the pond to the ocean, and swimming at the MRS from explosive hazards associated with MEC exposure:

- in and below the dunes (potentially up to 6 ft);
- in the top 3 ft of subsurface soil or sediment;
- during intrusive activities; and
- dune erosion.

The RAOs achieve these objectives by removing potential exposure to an explosive hazard. The RAOs were developed to address hazards under current and potential future land use which is not anticipated to change.

## 2.9 Description of Alternatives

CERCLA, Section 121, requires that each selected remedial alternative be: 1) protective of human health and the environment; 2) cost-effective; 3) comply with all applicable or relevant and appropriate federal and state requirements; and 4) use permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment (i.e., removal and disposal) as a principal element for the reduction of the hazard. The four remedial alternatives evaluated for the Tisbury Great Pond MRS include the following:

- Alternative 1 – No Action: A "no action" alternative is required by the NCP to be developed during a FS to provide a baseline for comparison against other contemplated alternatives. In Alternate 1, the government would take no action with regard to locating, removing, and disposing of any potential MEC present within the Tisbury Great Pond MRS.
- Alternative 2 – Land Use Controls (LUCs): The alternative involves the implementation of LUCs based on public awareness and educational components to provide a means to reduce MEC encounters by workers, recreational users, and visitors (i.e., unqualified personnel) through behavior modification.
- Alternative 3 – Partial Subsurface Clearance with LUCs: Alternative 3 includes removal of subsurface MEC up to approximately 3 ft bgs in the open areas (36.5 acres) and 3 feet to possibly 6 ft in/under the dunes (2 acres) (Figure 2-2). LUCs would be implemented on the remaining inland water and ocean areas, as described in Alternative 2.
- Alternative 4 – Subsurface Clearance: Alternative 4 includes clearing the entire 123.1-acre MRS of subsurface MEC up to approximately 3 ft bgs and possibly up to 6 ft below the dunes.

In accordance with DoDM 4715.20 (DoD, 2012), a minimum of three alternatives for each MRS are required. One alternative must consider a no action alternative, a second alternative must consider an action to remediate the site to a protective condition that requires LUCs, and a third must consider an action to remediate the site to a condition that allows UU/UE.

For the Tisbury Great Pond MRS, Alternative 1 meets the requirement for a no action alternative. Alternatives 2 and 3 meet the requirement for an alternative with LUCs, and Alternative 4 meets the requirement for an alternative which will achieve UU/UE.

Detailed documentation describing the development of each of the four alternatives with the results of the detailed and comparative analyses conducted as part of the FS are available for review in the AR in the *Final Feasibility Study, Tisbury Great Pond Munitions Response Area*. In the FS, the alternatives were evaluated and compared in relation to the nine NCP criteria prescribed for remedy selection in accordance with CERCLA. The alternatives are summarized below:

**Alternative 1 – No Action**

CERCLA requires that a "no action" alternative be evaluated for the purpose of comparison to the other proposed alternatives. This alternative means no action would be taken to locate, remove, and dispose of MEC. In addition, no public awareness or educational training would be initiated with regard to the hazards of MEC. For the No Action alternative, it is assumed that no change to the current land use of the Tisbury Great Pond MRS would occur. There would be no ***Applicable or Relevant and Appropriate Requirements (ARARs)*** associated with this alternative. **Alternative 1 Cost - $0**

**Alternative 2 – Land Use Controls**

Alternative 2 would consist of various ***LUC*** components to prevent humans from encountering MEC remaining at the MRS. LUCs would include awareness components such as 1) posting signs at public access locations; 2) distribution of brochures and fact sheets notifying the public of the Army's 3Rs policy (i.e., Recognize, Retreat, Report) and the explosive safety hazards when encountering MEC; and 3) an educational component to provide site-specific awareness training for the local community. There are no ARARs associated with Alternative 2 and since this alternative reduces the exposure to MEC rather than the amount of MEC, it is contingent upon the cooperation and active participation of the local government with the existing property owners (TTOR, the Commonwealth of Massachusetts [inland and coastal waters], and private landowners), local responders, and the public using the MRS. Approximately 6 months would be required to establish LUCs associated with Alternative 2. Since this remedial alternative will not allow for UU/UE, a Five Year Review is required by the NCP (40 CFR 300.430[f][4][ii]). Five Year Reviews will continue until any contaminants remaining on-site are at levels at or below those allowing for UU/UE. **Alternative 2 Costs - $369,000 (Alternative) + $42,000 x 6 (Five Year Reviews) = $622,000**

**Alternative 3 – Partial Subsurface Clearance with LUCs**

Alternative 3 includes removal of subsurface MEC up to approximately 3 ft bgs in the open areas (36.5 acres) and 3 ft to possibly 6 ft in/under the dunes (2 acres) (Figure 2-2). LUCs would be implemented on the remaining inland water and ocean areas, as described in Alternative 2. Thirty-one (31) ARARs were identified for this alternative during the FS. Untreated MEC in the ocean and inland water would potentially require offsite disposal on a long-term basis as MEC remaining

in the water would be exposed due to wave action and erosion of the ocean floor requiring disposal on a long-term basis as MEC items are discovered by the public. It is estimated that Alternative 3 would require approximately 6 months of planning and 6 months of fieldwork to implement. Alternative 3 would be implemented to comply with the identified ARARs. This alternative would also include LUC components and would require Five Year Reviews. **Alternative 3 Costs - $7,829,000 (Alternative) + $42,000 x 6 (Five Year Reviews) = $8,079,000.**

**Alternative 4 – Subsurface Clearance**

Alternative 4 includes all the activities in Alternative 3 (subsurface remediation of MEC on the beach and dunes) and adds MEC detection and removal in the inland waters and ocean area of the MRS, covering the entire 123.1-acre MRS. After all clearance operations are complete, a review of the site will be made (similar to a CERCLA 5 Year Review) that will ensure the effectiveness of the remedial actions for UU/UE.

Thirty-four (34) ARARs were identified for this alternative. It is estimated that Tisbury Great Pond MRS Alternative 4 would require approximately 6 months of planning and 12 months of field work to implement. Tisbury Great Pond MRS Alternative 4 would be implemented to comply with the identified ARARs. **Alternative 4 Costs - $9,826,000 (Alternative) + $42,000 (Review) = $9,868,000.**

## 2.10 Comparative Analysis of Alternatives

Nine CERCLA/NCP criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy (40 CFR 300.430[e][9]). The criteria were developed to address the CERCLA requirements and considerations, and to address the additional technical and policy considerations that are important in selecting remedial alternatives. The evaluation criteria with the associated statutory considerations are described below.

**Threshold Criteria:**

1. **Overall protectiveness of human health and the environment –** Determines whether an alternative achieves the RAO by eliminating, reducing, or controlling threats to public health and the environment through LUCs, engineering controls, or treatment. An emphasis is placed on effectiveness in terms of worker safety issues during remedial actions and post-remedial actions for local residents and workers based on future land use.
2. **Compliance with ARARs –** Evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that have been determined to be applicable or relevant and appropriate for the site, or whether a waiver is justified. The ARARs identified for the Tisbury Great Pond MRS alternatives are summarized in Table 2-4.

1 **Table 2-4. ARARs identified for Tisbury Great Pond MRS Alternatives**

| ARAR | Alternative 1 – No Action | Alternative 2 – LUCs | Alternative 3 – Partial Subsurface Clearance with LUCs | Alternative 4 – Subsurface Clearance |
|---|---|---|---|---|
| 16 U.S.C. §1538(a)(1) | x | x | ✓ | ✓ |
| 40 CFR 264.601 | x | x | ✓ | ✓ |
| 321 CMR 10.04(1) | x | x | ✓ | ✓ |
| 321 CMR 10.23(1) | x | x | ✓ | ✓ |
| 321 CMR 10.23(2) | x | x | ✓ | ✓ |
| 321 CMR 10.23(3) | x | x | ✓ | ✓ |
| 321 CMR 10.23 (6) (b) (1) | x | x | ✓ | ✓ |
| 321 CMR 10.23(6) (b) (2) | x | x | ✓ | ✓ |
| 321 CMR 10.23(7) (a) | x | x | ✓ | ✓ |
| 321 CMR 10.23(7) (b) | x | x | ✓ | ✓ |
| 310 CMR 9.40 (2)(b) (1st sentence) | x | x | ✓ | ✓ |
| 310 CMR 9.40 (3)(b) (1st sentence) | x | x | ✓ | ✓ |
| 310 CMR 10.25 (5) Land under the Ocean | x | x | x | ✓ |
| 310 CMR 10.25 (6) Land under the Ocean | x | x | x | ✓ |
| 310 CMR 10.25 (7) Land under the Ocean | x | x | x | ✓ |
| 310 CMR 10.27 (3) Coastal Beaches | x | x | ✓ | ✓ |
| 310 CMR 10.27 (6) Coastal Beaches | x | x | ✓ | ✓ |
| 310 CMR 10.27 (7) Coastal Beaches | x | x | ✓ | ✓ |
| 310 CMR 10.28 (3) Coastal Dunes | x | x | ✓ | ✓ |
| 310 CMR 10.28 (6) Coastal Dunes | x | x | ✓ | ✓ |
| 310 CMR 10.33 (3) Land under Salt Ponds | x | x | ✓ | ✓ |
| 310 CMR 10.33 (5) Land under Salt Ponds | x | x | ✓ | ✓ |
| 310 CMR 10.34 (4) Land Containing Shellfish | x | x | ✓ | ✓ |
| 310 CMR 10.34(5) Land Containing Shellfish | x | x | ✓ | ✓ |
| 310 CMR 10.34 (8) Land Containing Shellfish | x | x | ✓ | ✓ |
| 310 CMR 10.35(3) Banks of or Land under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run | x | x | ✓ | ✓ |
| 310 CMR 10.35(4) Banks of or Land under the | x | x | ✓ | ✓ |

| ARAR | Alternative 1 – No Action | Alternative 2 – LUCs | Alternative 3 – Partial Subsurface Clearance with LUCs | Alternative 4 – Subsurface Clearance |
|---|---|---|---|---|
| Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run | | | | |
| 310 CMR 10.35(5) Banks of or Land under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run | x | x | ✓ | ✓ |
| 310 CMR 10.37 5th paragraph, 1st sentence, Estimated Habitats of Rare Wildlife (for Coastal Wetlands) | x | x | ✓ | ✓ |
| 310 CMR 10.55 (4)(a) Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs) | x | x | ✓ | ✓ |
| 310 CMR 10.55 (4)(b) Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs) | x | x | ✓ | ✓ |
| 310 CMR 10.55 (4)(d) Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs) | x | x | ✓ | ✓ |
| 314 CMR 9.06 (2)(1st sentence) | x | x | ✓ | ✓ |
| 314 CMR 9.07 (1)(a)(1st sentence) | x | x | ✓ | ✓ |

**Notes:**
× Not Identified as ARAR for Alternative ✓ Identified as ARAR for Alternative
CMR = Code of Massachusetts Regulations

No ARARs were identified associated with Alternatives 1 or 2. The requirements considered consist of both administrative and substantive provisions. However, in order to satisfy the definition of an ARAR, a provision must be substantive. Therefore, only substantive provisions are listed above. For alternatives involving clearance activities, 40 CFR part 264, Subpart X would be an ARAR if Material Potentially Presenting an Explosive Hazard (MPPEH) or confirmed MEC items are identified requiring on-site disposal operations, and if consolidated shot approach is employed in lieu of a BIP technology. The Federal Endangered Species Act's prohibition on take at 16 U.S.C. §1538(a)(1) and the Massachusetts Endangered Species Act's prohibition on take at 321 CMR 10.04 (1) and (2) are also ARARs associated with clearance activities since threatened and endangered species have been observed at the site. See Responsiveness Summary Section 3.3 for further explanation of substantive provision of State ARARs.

**Balancing Criteria:**

3. **Long-term effectiveness and permanence –** Considers the ability of an alternative to maintain protection of human health and the environment over time. The evaluation of the long-term effectiveness and permanence of containment and controls takes into account the magnitude of residual hazards, the adequacy of the alternative in limiting

the hazard, the need for long-term monitoring and management, and the administrative feasibility of maintaining the LUCs and the potential hazard should they fail. The evaluation also considers mechanisms such as the CERCLA Five Year Review process to assess on a periodic basis the long-term effectiveness and permanence, as well as the protectiveness, of the alternative.

4. **Reduction of toxicity, mobility, or volume (TMV) of contaminants through treatment –** Considers an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present, in this case MEC.

5. **Short-term effectiveness –** Considers the length of time needed to implement an alternative and the hazards the alternative poses to workers, residents, and the environment during implementation. In addition, for MEC, safety considerations include an evaluation of what resources are available and how long it will take to mitigate MEC hazards and achieve RAOs.

6. **Implementability –** Considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services, and the relative effort associated with implementation of the alternative.

7. **Cost –** Includes estimated capital costs. Cost estimates are expected to be accurate within a range of +50% to -30%.

**Modifying Criteria:**

8. **State acceptance –** Assesses the technical and administrative issues and concerns the state (i.e., MADEP) may have regarding each of the alternatives evaluated in this DD. State acceptance of the alternatives was evaluated during the PP public comment period.

9. **Community acceptance –** Assesses the issues and concerns the public may have regarding each of the alternatives evaluated in this DD. Community acceptance of the alternatives was evaluated during the PP public comment period.

### 2.10.1 Comparative Analysis of Tisbury Great Pond MRS Alternatives

1. **Overall Protectiveness of Human Health and the Environment –** Because MEC was identified during the RI in the subsurface, and based on the determination of unacceptable risk presented by MEC hazards accessible to the public at the Tisbury Great Pond MRS, the threat of human exposure to MEC and the potential for MEC to be handled by unqualified and untrained personnel exists. Alternative 1 would not eliminate, reduce, or control the threat of human exposure to subsurface MEC; therefore, it does not meet the threshold criteria and cannot be considered further. Alternative 2 would be protective since

it controls exposure to MEC through LUCs. Alternative 3 provides protectiveness as MEC would be destroyed throughout the land and beach portion of the MRS (38.5 acres) and would control exposure to MEC through LUCs for the remaining 84.6 acres of the MRS. Alternative 4 would be protective of human health because subsurface MEC would be removed from the entirety of the MRS (123.1 acres) and destroyed. Risks to the environment associated with Alternative 4 are greatest and would require extensive planning, management, monitoring of endangered and threatened species, restoration, and potential follow-on work to ensure vegetative recovery is attained.

2. **Compliance with ARARs –** There are no ARARs associated with Alternative 1 or Alternative 2, and Alternatives 3 and 4 would be implemented and performed to comply with all ARARs. Field work for Alternatives 3 and 4 would be scheduled during the offseason and during those times when endangered or threatened species and habitats would not be adversely affected. In addition, Alternatives 3 and 4 would require a biologist to survey the area prior to any intrusive work to ensure clearance activities would not adversely impact threatened or endangered species. Alternative 4 would be the most intrusive in nature and would require significant attention to avoid impacts on environmental resources.

3. **Long-Term Effectiveness and Permanence –** Alternative 2 would be protective since it controls exposure through LUCs. However, it relies on exposure control rather than removal or treatment. Under Alternative 3, all MEC would be destroyed within the accessible portion of the MRS, but would still require LUCs in the long-term. Alternative 4 would remove MEC hazards from within the entirety of the MRS and would be the most effective and permanent remedial alternative over the long-term because it would eliminate the hazard.

4. **Reduction of TMV of Contaminants Through Treatment –** Alternatives 1 and 2 would not reduce the TMV of MEC within the MRS. Alternative 3 would be effective in the reduction of TMV through removal of all MEC within the land and beach portion of the MRS (38.5 acres). Alternative 4 would be the most effective in reducing the TMV of MEC because all detectable MEC throughout the entirety of the MRS would be removed and destroyed. Alternatives 3 and 4 would satisfy the statutory preference for treatment as a principal element of the remedy because MEC would be destroyed.

5. **Short-Term Effectiveness –** Because no construction activities are associated with either alternative, Alternatives 1 and 2 would not present significant additional hazard to the public or workers at the MRS. Alternatives 3 and 4 would increase hazard to the public and workers during clearance of MEC to variable degrees based on the implementation of exclusion zones for intrusive activities and in cases where MPPEH or suspect MEC is encountered requiring destruction on-site to render the item MDAS. Alternatives 1 and 2

would not cause damage to the environment because no clearing, grubbing, or excavation would be required. Alternative 3 would cause some damage to the environment because of the vegetation clearance required to conduct subsurface activities on a portion of the MRS. Alternative 4 would cause the most initial damage to the environment and would require interim measures for protection and significantly more restoration than Alternative 3 as a result of the larger scale of vegetation clearance and intrusive activities throughout the entirety of the MRS. The time durations required to complete Alternatives 2, 3, and 4 range from approximately 6 to 12 months.

6. **Implementability –** Alternatives 1 and 2 would both be easily implementable. Alternatives 3 and 4 would also be implementable, but would require considerable more effort and manpower than Alternatives 1 and 2. Subsurface clearance technologies are proven and were successfully implemented within the MRS during the RI. Alternative 4 would be more difficult to implement than Alternative 3 since it requires clearance of the underwater portion of the MRS. Alternatives 2, 3, and 4 also require landowner cooperation in granting access to the property through a ROE agreement. Refusal of right of entry for any parcels reduced implementability for Alternatives 2, 3, and 4. Specific activities, including development of awareness training materials for workers and use of protection procedures and mitigation techniques would be required to preserve and restore environmental resources during implementation of Alternatives 3 or 4.

7. **Cost –** The total cost to perform each alternative is as follows:

- Alternative 1 = $0
- Alternative 2 = $622,000
- Alternative 3 = $8,079,000
- Alternative 4 = $9,868,000

Note: Costs have been rounded to the nearest thousand dollars. Costs provided here include Remedial Alternative Costs plus 5-year or verification review costs ($42,000 per review) to provide a meaningful comparison.

8. **State Acceptance**

MADEP concurs with the proposed remedy.

9. **Community Acceptance**

A Responsiveness Summary has been compiled and presented in Section 3 of this DD to document comments received from the public and considered by USACE with detailed responses for the record. There are two primary property owners that impact the successful implementation of the proposed remedy. They are the TTOR and the Tssissa Corp. The TTOR is the majority property

owner with the most acreage (31 acres) in the proposed remediation footprint. The TTOR land is open to the public for recreation and receives approximately 36,000 visitors per year at this location. TTOR staunchly supports the selected remedy to ensure public safety during recreational activities. The secondary property owner, Tssissa Corp, with the next most acreage (9.75 acres) in the remediation footprint has currently refused right of entry (ROE). During the RI, 4 MEC and 3 MD items were found on Tssissa Corp Property, which represents approximately 50% and 10% of all MEC and MD finds respectively, found within the remediation footprint. The remaining property owners within the footprint have not commented on the proposed remedy and are a much smaller percentage of the acreage (4.98 acres) within the remediation footprint. All other comments received and addressed in the responsiveness summary were from members of the community and/or landowners outside the remediation footprint that are opposed to the proposed remedy.

### 2.10.2 Comparative Analysis Summary

Table 2-5 presents the comparative summary of the detailed analysis of the alternatives for the Tisbury Great Pond MRS. The subsurface clearance of the entire MRS most favorably meets all of the evaluated detailed analysis criteria as compared to other alternatives. While the complete subsurface clearance alternative would require the most manpower and time to implement, it would provide the highest level of protectiveness over the long-term and will achieve the RAO for Tisbury Great Pond to reduce the unacceptable probability of MEC encounter at the MRS such that a negligible probability of encounter can be supported for recreational users, landowners, visitors, and workers conducting activities such as boating, fishing, swimming, hiking, and excavation of the dunes at the MRS from explosive hazards associated with MEC exposure in and below the dunes, and in the top 3 ft of subsurface soil or sediment during intrusive activities, and from exposure of munitions due to dune erosion.

## Table 2-5. Comparative Summary of Detailed Analysis of Remedial Alternatives

| Evaluation Criteria | Alternative 1: No Action | Alternative 2: LUCs | Alternative 3: Partial Subsurface Clearance with LUCs | ***Preferred** Alternative 4: Subsurface Clearance |
|---|---|---|---|---|
| 1. Overall Protection of Human Health and Environment | ■ | ● | ● | ● |
| 2. Compliance with ARARs | ● | ● | ● | ● |
| 3. Long-Term Effectiveness | ■ | □ | □ | □[2] |
| 4. Reduction of TMV through Treatment | ■ | ■ | □ | □[2] |
| 5. Short-Term Effectiveness | ■ | ● | □ | □ |
| 6. Implementability | ● | □[2] | □[2] | □[2] |
| 7. Cost[1] | $0 | $622,000 | $8,079,000 | $9,868,000 |
| 8. State Acceptance | ■ | ■ | ■ | ● |
| 9. Community Acceptance | □ | □ | □ | □[3] |

**Notes:** [1] Costs provided here include Remedial Alternative Costs plus review costs ($42,000 per review) to provide a meaningful comparison.

[2] Moderate rating is due to ROE refusal; if ROE is granted in the future, rating will become Favorable

[3] Moderate rating is due to TTOR acceptance as majority land owner/land open to the public (36,000 visitors/year)

● Favorable
□ Moderately Favorable
■ Not Favorable

### 2.11 MEC Hazard

MEC are materials that present a potential explosive hazard to human health or the environment should exposure occur. All of the alternatives, except Alternative 1, would address the MEC hazard. Alternative 2 would address the hazard by reducing the potential for exposure through increased public awareness rather than treatment. Alternative 4 would address the hazard most effectively by removing and disposing of all detectable MEC and by increasing public awareness.

### 2.12 Selected Remedy

Based on the requirements of CERCLA and the NCP, and on a detailed analysis of the remedial alternatives using the nine criteria (which includes public and state comments), USACE has selected Alternative 4 – Subsurface Clearance as the remedy for the Tisbury Great Pond MRS. The selected remedy includes subsurface detection, removal, and disposal of munitions located

within the MRS (123.1 acres); and interim LUCs in the form of public education and notification until UU/UE is achieved. Alternative 4 meets the RAOs of reducing the unacceptable probability of MEC encounter at the MRS such that a negligible probability of encounter can be supported for the public, private land owners, workers, and contractors.

### 2.12.1 Summary of the Rationale for the Selected Remedy

The Selected Remedy is based on the findings of the RI. In addition, six UXO emergency responses were initiated between 2009 and 2011 for MEC/MD items found in the vicinity of "Cuts" in the barrier beach made to drain the pond. During these responses, 14 MD items, and one confirmed MEC item were discovered as previously discussed, with the MEC item subsequently disposed of by Navy EOD and documented as HE. One additional ordnance item was also identified, but due to currents in the cut, it was not able to be further interrogated. The Selected Remedy is believed to provide the best balance of trade-offs among the alternatives with respect to the CERCLA/NCP criteria. USACE believes that the Selected Remedy can be easily implemented based upon similar investigations conducted previously at the Tisbury Great Pond MRS, and is most cost-effective relative to the other MEC removal alternatives while still being protective of human health in the long-term. USACE will implement and perform the selected Alternatives to comply with all ARARs.

### 2.12.2 Detailed Description of the Selected Remedy

The Subsurface Clearance alternative for the Tisbury Great Pond MRS is the preferred alternative. Based on information currently available, the lead agency believes the Preferred Alternative for the MRS meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The USACE expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA Subsection 121 (b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. Alternative 4 is effective for the long-term and provides permanence, can be readily implemented to achieve the RAOs, and provides the highest level of overall effectiveness of reducing the unacceptable probability of MEC encounter at the MRS such that a negligible probability of encounter can be supported for current and future use of the MRS. The short-term effectiveness is moderately favorable. USACE expects the Preferred Alternative to meet regulatory requirements and to satisfy the statutory requirements under CERCLA §121(b).

Alternative 4 includes clearing the entire 123.1 acre MRS of subsurface MEC up to approximately 3 ft bgs, and up to potentially 6 ft under the dunes. The following general tasks would be included in Alternative 4.

- Mobilization;

- Site management;
- Environmental Coordination and Environmental Monitoring;
- Survey and positioning;
- Brush clearing (where needed);
- Dune excavation and sifting/inspection;
- "Mag & dig" within the ocean area (detect the item with a magnetometer and excavate);
- DGM and data analysis within the inland water and land areas;
- Anomaly reacquisition and resolution;
- MEC removal/Disposal (e.g., Blow In Place [BIP]);
- MDAS waste stream treatment (off-site) disposal;
- Site restoration;
- Post construction vegetation monitoring;
- Demobilization;

After all clearance operations are complete, a review of the site (similar to a CERCLA 5 Year Review) will be made to ensure the effectiveness of the remedial actions for UU/UE and to ensure that vegetation restoration activities are successful.

Alternative 4 requires clearance activities in all four areas of the MRS: dunes, land, inland water, and ocean (Figure 5-2).

**Dunes:** Similar to Alternative 3, Alternative 4 will require the excavation and sifting, or removal in lifts, of the dunes, which comprise approximately 2 acres of the MRS. The dunes would be excavated in lifts and the sand would be either sifted, or personnel with hand-held sensors would inspect excavated material from each lift to remove MEC. Approximately 2 ft below the dunes would also be excavated and sifted/inspected in the same manner. DGM would be conducted at the base of the excavation and individual anomalies excavated as needed to a total depth of 3 ft below the base of the dune. However, if anomalies are detected below a dug anomaly, they will be investigated, removed, and properly disposed of. The dunes would be restored upon completion of sifting operations.

**Land portion of MRS:** Some vegetation clearance will be necessary to gain access during the clearance. Disposal of removed vegetation will be coordinated with TTOR, landowners, and USACE subject matter experts during the development of the remedial action work plan to ensure the habitat is not detrimentally affected. Detection of MEC on land would be performed using digital detection instrumentation. Positioning for the digital instrumentation would be conducted using a Global Positioning System (GPS). These technologies are anticipated to be viable based on MRS-specific munitions and physical characteristics and successful past use at the MRS during the RI.

Anomalies would be reacquired using a robotic total station. Intrusive activities would be performed using both mechanized equipment and hand-tools and restoration of disturbed areas would be required.

Because sensitive species are known to exist within the MRS, this alternative will require coordination with MA NHESP, TTOR, and USFWS. Coordination with USFWS will establish conditions for working in areas where federally listed species may be present. A rare plant and wildlife habitat evaluation will be conducted during development of the work plan in accordance with MA NHESP guidelines. Fieldwork would be scheduled to avoid sensitive species as much as possible. In addition, biological monitoring during the remedial action and possibly habitat restoration, would be required as mitigation measures.

Unavoidable adverse impacts to vegetation would occur as a result of this alternative and would require site restoration in areas where vegetation was cleared. Detailed restoration activities and post construction vegetation monitoring would be presented in the remedial action work plan and coordinated with TTOR and resource agencies.

**ROE Refusal:** For parcels where ROE is refused, interim LUCs will be implemented on abutting properties where ROE has been obtained, to minimize hazards to the public. The interim LUCs will be maintained until such time as the remedy is fully implemented and UU/UE is achieved on those properties. In addition, for parcels where ROE is refused, the Lead Agency will recommend to the appropriate property owners and/or governing bodies that restrictions such as Ordinances to prevent intrusive activities including excavations to drain the pond (opening of the cut in areas not remediated) be instituted to further protect the public from potential MEC exposure and migration.

**Inland water portion of MRS:** DGM would be utilized on the entire MRS. Positioning for the digital instrumentation would be conducted using a GPS.

Anomalies identified during DGM activities would be reacquired using a robotic total station and anomaly resolution (or intrusive activities) would be performed using a combination of hand-tools, as successfully accomplished during the RI, and mechanical methods. Mechanical methods (such as a marsh buggy or similar excavator with floatation tracks) would be used for deeper anomalies which could require excessive time to dig by hand underwater.

Work plans will require coordination with the Massachusetts Division of Marine Fisheries, NOAA NMFS, USFWS, and town Shellfish Advisory Committees.

**Ocean:** Due to the dynamic nature of the ocean surf zone, a "Mag and Dig" technique will be used for ocean clearance activities. Divers identified anomalies on transects using an underwater hand-held analog instrument, and subsequently excavated each anomaly as it was found.

**Common activities for all MRS areas:** Any MPPEH recovered during the clearance would be BIP for detonation. The MD would be consolidated during removal, inspected and certified as explosive-free MDAS, and disposed off-site for recycling.

Based on the RI findings, there is a low probability for encountering MEC other than MK-23 practice bombs with spotting charges. However, for protection of the public during remedial activities, informational materials will be developed and distributed to property owners, awareness training materials will be developed and distributed, and signs will be installed to ensure the safety of land owners, workers, and the public. After work is complete, a remedial action report will be issued and provided to the State of Massachusetts.

Remaining Land and Water MRS:

There is no MEC or MC hazard present at the Remaining Land and Water MRS, therefore, No Action is the selected remedy for the Remaining Land and Water MRS.

### 2.12.3 Cost Estimate for the Selected Remedy

The total cost to perform Alternative 4 at the Tisbury Great Pond MRS is $9,868,000.

Detailed cost estimate for the Tisbury Great Pond MRS was developed as part of the FS and has been adopted for this DD and provided in Table 2-6. The information in this cost estimate is based on the best available information regarding the anticipated scope of the remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedy. Major changes, if they occur, may be documented in the form of a memorandum in the AR file, an Explanation of Significant Differences, or a DD amendment.

### 2.12.4 Estimated Outcomes of Selected Remedy

Based on the information available at this time, the Selected Remedy for the Tisbury Great Pond MRS, Subsurface Clearance, will be protective of human health and the environment, will comply with ARARs, and will be cost-effective.

Upon implementation of the remedy, there will be no anticipated change in the use of the land or resources at the MRS. Refusal of ROE preventing implementation of the remedy on one or more parcels will result in implementation of interim land use controls on abutting property where ROE has been obtained to manage any potential residual hazard on those parcels where ROE has not been obtained, until the remedy can be fully implemented within the MRS and UU/UE is achieved. In addition, for parcels where ROE was refused, the Lead Agency will recommend to the appropriate governing bodies that restrictions such as Ordinances to prevent intrusive activities including excavations to drain the pond (opening of the cut in areas not remediated) be instituted to further protect the public from potential MEC exposure and migration. USACE is responsible for implementing, maintaining, and reporting on the remedial action. Although USACE may later

transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, USACE shall retain ultimate responsibility for the remedy.

## 2.13 Statutory Determinations

Under CERCLA Section 121, the USACE must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the TMV of hazardous substances as their principal element. The following subsections discuss the remedy in light of the statutory requirements.

### 2.13.1 Protection of Human Health and the Environment

The Selected Remedy, Tisbury Great Pond MRS Alternative 4, will protect public health and welfare through mitigation of hazards to public health and welfare from exposure to potential residual MEC where the remedy is implemented. For parcels where ROE was refused, implementation of interim LUCs will be recommended to minimize hazards to the public until the remedy can be fully implemented and UU/UE is achieved. In addition, for parcels where ROE is refused, the Lead Agency will recommend to the appropriate governing bodies that restrictions such as Ordinances to prevent intrusive activities including excavations to drain the pond (opening of the cut in areas not remediated) be instituted to further protect the public from potential MEC exposure and migration. These measures are recommended due to 6 UXO emergency responses between 2009 and 2011 which resulted in documented MEC/MD finds associated with past cut activities.

### 2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The remedy selected will be performed to comply with all ARARs.

## Table 2-6. Cost Summary Tisbury Great Pond MRS Alternative 4

Tisbury Great Pond MRS
Alternative 4
Complete Subsurface Clearance
123 Acres (land and water)

**COST:**

| Bid Item No. | Description | QTY | Unit | Team Production (Units/Day) | # Teams | Duration (Weeks) | Weekly Cost Per Team | Cost Per Acre | Total |
|---|---|---|---|---|---|---|---|---|---|
| 0100 | Work and Safety Plans, UFP-QAPP, TPP | 1.00 | LS | N/A | N/A | N/A | $ 97,169 | N/A | $ 97,169 |
| 0110 | Explosive Safety Submission | 1.00 | LS | N/A | N/A | N/A | $ 23,515 | N/A | $ 23,515 |
| 0200 | Mobilization - Per Person | 29.00 | Person | N/A | N/A | N/A | $ 1,756 | N/A | $ 50,932 |
| 0300 | Site Management | 32.00 | Week | 1.00 | 1 | 32.00 | $ 49,906 | N/A | $ 1,597,000 |
| 0310 | Survey/Positioning | 33.50 | AC | 10.00 | 1 | 0.67 | $ 15,389 | $ 308 | $ 10,311 |
| 0320 | Brush Clearing | 5.00 | AC | 1.00 | 1 | 1.00 | $ 2,865 | $ 2,865 | $ 2,865 |
| 0330 | Environmental Monitoring and Coordination (Habitat Survey) | 1.00 | LS | N/A | N/A | N/A | $ 39,621 | $ 39,621 | $ 39,621 |
| 0400 | MEC Surface Removal | 0.00 | AC | 3.00 | 2 | 0.00 | $ 43,586 | $ - | $ - |
| 0410 | MEC Sub-surface Removal, Analog | 0.00 | AC | 2.00 | 1 | 0.00 | $ 45,168 | $ - | $ - |
| 0420 | Digital Geophysical Mapping | 33.50 | AC | 4.00 | 1 | 1.68 | $ 21,389 | $ 1,069 | $ 35,826 |
| 0430 | Digital Data Analysis | 33.50 | AC | 4.00 | 1 | 1.68 | $ 9,164 | $ 458 | $ 15,349 |
| 0440 | Anomaly Reacquisition | 33.50 | AC | 3.00 | 1 | 2.23 | $ 15,389 | $ 1,026 | $ 34,370 |
| 0450 | Anomaly Resolution | 33.50 | AC | 2.50 | 1 | 2.68 | $ 45,168 | $ 3,613 | $ 121,049 |
| 0460 | Dune MEC Removal - Sand Sifting | 155,250 | CY | 400.00 | 4 | 19.41 | $ 46,205 | $ 23 | $ 3,586,638 |
| 0500 | Underwater MEC Removal - No Divers | 7.00 | AC | 1.00 | 2 | 0.70 | $ 45,685 | $ - | $ 63,959 |
| 0510 | Underwater MEC Removal - Divers | 21.00 | AC | 1.5 | 2 | 1.40 | $ 86,667 | $ - | $ 242,667 |
| 0520 | DGM - Underwater | 56.00 | AC | 4.0 | 1 | 2.80 | $ 25,099 | $ - | $ 70,278 |
| 0540 | Anomaly Resolution - Underwater | 56.00 | AC | 1.5 | 2 | 3.73 | $ 86,667 | $ - | $ 647,113 |
| 0600 | MDAS Certification and Disposal | 1.00 | LS | 0.2 | 1 | 1.00 | $ 19,545 | N/A | $ 19,545 |
| 0610 | Site Restoration | 1.00 | LS | 0.1 | 1 | 2.00 | $ 36,159 | $ 583 | $ 72,319 |
| 0620 | Demobilization | 29.00 | Person | N/A | N/A | N/A | $ 690 | N/A | $ 20,016 |
| 0700 | Remedial Action Completion Report | 1.00 | LS | N/A | N/A | N/A | $ 78,598 | N/A | $ 78,598 |
| 0710 | Land Use Control Plan | 1.00 | LS | N/A | N/A | N/A | $ 36,741 | N/A | $ 36,741 |
| 0800 | Land Use Control Implementation | 1.00 | LS | N/A | N/A | N/A | $ 94,328 | N/A | $ 94,328 |
| 0810 | Annual Post-Construction Revegetation Monitoring | 3.00 | Year | N/A | N/A | N/A | $ 27,695 | N/A | $ 83,085 |
| | Sub-Total | | | | | | | | $ 7,043,294 |
| | Contingency | 15% | | | | | | | $ 1,056,494 |
| | Sub-Total | | | | | | | | $ 8,099,788 |
| | Infrastructure Improvements | 2% | | | | | | | $ 161,996 |
| | Project Management | 5% | | | | | | | $ 404,989 |
| | Remedial Design (USACE) | 8% | | | | | | | $ 647,983 |
| | Construction Management (USACE) | 6% | | | | | | | $ 485,987 |
| | **Total Cost** | | | | | | | | **$ 9,800,743** |

**LONG-TERM MANAGEMENT COST:**

| | Description | | Year | QTY | Unit | Unit Cost | Total |
|---|---|---|---|---|---|---|---|
| 900 | Long-Term Management | | 1-4 | 4 | EA | $ 5,408 | $ 21,632 |
| 910 | UXO On-call Support | | 1-4 | 0 | EA | $ 10,422 | $ - |
| | Sub-Total | | | | | | $ 21,632 |
| | Contingency | 15% | | | | | $ 3,245 |
| | Project Management | 5% | | | | | $ 1,082 |
| | **Total Long-Term Management Cost** | | | | | | **$ 24,877** |

**ALTERNATIVE 4: TOTAL CAPITAL AND LONG-TERM MANAGEMENT COST: $ 9,825,620**

**PERIODIC COST:**

| | Description | Year | QTY | Unit | Unit Cost | Total |
|---|---|---|---|---|---|---|
| 0820 | Five Year Review (cost per review) | 5 | 1 | EA | $ 42,166 | $ 42,166 |

**ALTERNATIVE 4: TOTAL ALTERNATIVE COST PLUS REVIEW COST $ 9,867,786**

AC = acres EA = each LS = lump sum N/A = not applicable WK = week

### 2.13.3 Cost Effectiveness

The Selected Remedy is cost-effective because it represents a reasonable value for the costs incurred. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" (NCP §300.430[f][l][ii][D]). This was accomplished by evaluating the "overall effectiveness" of alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in TMV through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedy was determined to be proportional to its costs and hence this remedy represents a reasonable value for the costs incurred. As indicated by the comparative analysis conducted for all remedial alternatives considered during the FS, the Selected Remedy, Tisbury Great Pond MRS Alternative 4, is the most cost-effective alternative that is ARAR-compliant and that provides acceptable levels of achievement of the other evaluation criteria.

### 2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Possible

The Selected Remedy represents the maximum extent to which a permanent solution can be implemented in a practicable manner in the Tisbury Great Pond MRS. Alternative treatment technologies and/or resource recovery technologies were found to not be appropriate for site conditions. Of those alternatives that are protective of human health and the environment and comply with ARARs, the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria.

### 2.13.5 Preference for Treatment as a Principal Element

Treatment of MEC consists of removal and disposal. The Selected Remedy, Subsurface Clearance, satisfies the statutory preference for treatment as a principal element of the remedy by removing and disposing of the subsurface MEC.

### 2.13.6 Five Year Review Requirements

If this remedy is fully implemented for the entire MRS resulting in UU/UE, Five Year Reviews are not required. If the remedy is not fully executed within 5 years after the start of work, including due to ROE refusal, 5 year reviews will be required.

## 2.14 Documentation of Significant Changes from Preferred Alternatives of Proposed Plan

To fulfill CERCLA and NCP, the DD must document and discuss the reasons for any significant changes made to the selected remedy. Changes include those reasonably anticipated by the public from the time the PP was released for public comment to the final selection of the remedy. The

PP for the Tisbury Great Pond MRS was advertised for public availability in June 2015. The PP identified Subsurface Clearance as the response action for Alternative 4. A Public Meeting was conducted on 23 June, 2015 at the West Tisbury Free Public Library. Written comments were received during the public comment period from the public and stakeholders and are summarized in Section 3, Responsiveness Summary.

# 3. RESPONSIVENESS SUMMARY

The public comment period for the PP was held from 15 June 2015 to 17 July 2015. Instructions were given on how to obtain and review information pertaining to the MRS as well as how to submit formal comments. The public was also given an opportunity to attend and provide comments on the PP at the Public Meeting held on 23 June 2015. This Responsiveness Summary provides an overview of community and support agency comments and concerns regarding the hazard identified at the sites.

## 3.1 Stakeholder Issues and Lead Agency Responses

This section summarizes the stakeholder and public comments received during the comment period and at the public meeting on the PP and lead agency responses to those comments. Additional details can be found in the transcript for the public meeting, which is available in the AR. There were numerous public comments received regarding the PP. The following public and stakeholder comments were received.

**Public Comment 1:**

Thanks for a very informative and understandable presentation by the Army Corps last night in the WT Library with respect to the proposed project for Tisbury Great Pond. Although there was a great deal of somewhat technical information, jotting down notes about the basic concepts was relatively easy. I was surprised at the stenographer's problems with recording the proceedings although I certainly sympathize at attempting to keep the details accurate. Have you folks considered videotaping proceedings -- which might be easier and provide a very accurate record? In order that there be additional copies of both the report and the proposal available, please send me two copies of both at the address below. I will provide one copy to the Jones family (Tsissa Corp) which is a major player out on the beach along with The Trustees of Reservations. Unfortunately a number of members of the Jones family do not live on the Vineyard and accessing the sole West Tisbury copy of each report in the WT Library is impossible. Although the reports are available online, having the material at hand makes them a lot easier to review and use. I intend to use the second copy for myself and to have on file in the Planning Board office in Town Hall.

In spite of the clarity and the completeness of your presentation and the compelling comments of several members of the "team," I do have strong reservations about the proposed remediation. As Keston Smith commented, whatever "may" be reposing in the dunes or under the mud of the Pond has been there for over 70 years and there have been no reports of any issues in all that time. Although some ordnance has been discovered in your most recent "geophysical surveillance" it appears that the greatest concern is that when the Pond is opened -- which it is periodically in connection with the oyster fisheries (an important resource) and the Pond flushes out, that various bits and pieces of ordnance area are also flushed out and migrate down the coast towards

Edgartown. As I noted last night the Pond has been known to open itself -- when there is a bad storm and the Pond is very high, or in other circumstances. The dunes do get "sheared off" by storms and high winds but they do rebuild. Changing anything around out there on the beach is always undertaken very carefully and after a great deal of thought and observation. For years we actually dug the cut open "by hand" in a large community undertaking. Now it is undertaken by the Riparian Owners commissioners and power equipment but only when conditions are ideal.

To the argument that any possible ordnance "MAY" be a safety issue and "that some little kid could get hurt or killed" you have to be aware that beyond the beach is the ocean. Inside the beach is the Pond with its natural hazards. Meanwhile the ocean has scary conditions at times with rip tides, steeply shelving beach and less than informed, inattentive, or careless beach goers. Those of us who live around the Pond all have our own horror stories. Many people have gotten in trouble out there on that beach -- including little children whose parents or care givers ignore them. Some have drowned. Further, with the advent of more extreme weather through climate change there are greater changes to the beach coming than we can anticipate. We respect it and take care of it as it is our buffer against flooding and further coastal erosion and we tamper with it at our peril. Finally, if anyone thinks that any possible ordnance presents a future problem to beach goers, they should be aware that as the oceans warm, the increasing numbers of Great White Sharks (and other serious predators) out there presents a much more present danger.

So I find, in this instance, that public safety (the endangered child syndrome) is a dubious reason to undertake a $10 million project. There are other public dangers from the proposed course of action (option 4) which apparently have not been considered such as possible danger to the oyster beds, or flooding/erosion. Please keep in mind "the law of unintended consequences!" Taking off 10 feet of dunes as well as inland and ocean waters to be able to access the lower 3 feet by sophisticated "geophysical" detection just doesn't make any sense to me for many different reasons. The dunes are a complex system -- as the ACE understands -- and although remediation is possible, restoring the dunes to their pre-excavation condition is a very difficult and complex process. We know that you can do it, but must you? I don't think so.

For your information:

I can remember seeing planes flying low over the beach at the end of WW II, and remember that we found stray bits of ordnance around the Pond shores over the years. As was noted, there have been no issues. The Pond group referenced is The Riparian Owners of Tisbury Great Pond -- they have been caring for the Pond and the shores for upwards of 70 years and doing it at no cost to the average Joe Public. The Riparian Owners know what to do if anything "funny" is found and that is call "911."

I hope that a simpler solution can be found for the perceived problem, although, truthfully I don't see that there is a real problem. If you must choose one of the four options presented, and Option

#1 (no action, no cost) is not acceptable, please choose #2 at $622,000, which is minimally invasive while still protecting the public and the environment.

Thank you, and I look forward to receiving those reports.

Virginia Crowell Jones, Foxfire Marine Consulting, LLC P O Box 400, or 39 New Lane West Tisbury, Massachusetts, 02575 USA

**Public Comment 2:**

My family has been walking to the south shore along the eastern edge of Tisbury Great Pond beyond Middlepoint since the 1940s (my Grandfather, E.A. Moore, owned Middlepoint) and we never had a problem with exploding ordnance. The Corps of Engineers report is difficult to read because of the numerous abbreviations and seems to be a lengthy justification of how to use the funds granted to them to carry out the project. Over the years more and more summer people have used the area for recreational purposes and I haven't heard of anyone who's been blown up by unexploded bombs. I was told long ago that the bombs were dummy bombs used for target practice.

I think this report is a lot of hoopla about an area that doesn't need changing. I wish the Corps of Engineers would use the funds for something more useful for a greater number of people.

Martha Moore

Riparian Owner, Tisbury Great Pond

**Public Comment 3:**

I am a business owner and resident of Martha's Vineyard for over forty years. Please count me as opposed to the asinine idea of wasting millions of dollars "cleaning up" old WW II armaments on Martha's Vineyard.

Please spend the money, if you have to spend it, on something wiser. Repairing the Bourne Bridge? The likelihood of those old armaments hurting someone is minimal.

Thanks for your consideration.

Ellen Obrien

222 Daggett Ave

Vineyard Haven Ma. 02568

**Public Comment 4:**

Ms. Charette's presentation at the West Tisbury Library last month was admirably clear, and crystallized my STRONG preference for option #2, the education and posting only option.

There are many dangers to the environment and fisheries from the implementation of Options 3 & 4, and absolutely no evidence that any harm has occurred or will occur, after over 70 years of continuing public exposure to the theoretical hazards inherent in the aged sitting charges and rusting metal in the remains of the practice bombs.

There is, of course, no predictability in letting the ocean, currents, winds and erosion handle this problem, but there is even less security if we add man's interference into this constantly evolving system, even so well intentioned and informed an interference as that of the Army Corps of Engineers.

Please, please, please do nothing more radical than Option #2.

As a riparian owner, I already alert renters to the hazard of rusting ordnance as well as the hazards of tides and ticks. Having your information, generated as part of Option #2, to hand out would be a positive resource for all riparian owners, including TTOR.

On the other hand, allowing the Corps to tear up, and as possible, try to restore the dune and the fisheries, is tampering on a grand scale in a fragile environment. The ponds and coves along the south shore of Martha's Vineyard are irreplaceable. Small as they are, they represent a significant portion of all glacial outwash plain eco-systems on the whole planet. Doubtless they will succumb to the ocean in due time, but until then, I urge, with all my heart, that we humans, even the very qualified humans from the ACE, refrain from interfering.

Please choose #2 at $622,000, which is minimally invasive while still protecting the public and the environment.

Thank you, and please feel free to get in touch with me if there is any way I can clarify these comments.

Felicity Russell, Deep Bottom Cove Trust, P.O. Box 3097, West Tisbury, Massachusetts, 02575 USA

**Public Comment 5:**

As a riparian owner on Tisbury Great Pond for nearly 50 years, an owner of a Quansoo Beach lot for just as long and a user of the barrier beach in the affected area for my entire life, the proposed response is wholly disproportionate to the negligible risk of injury to any user of the affected areas. Apart from one stubbed toe on a small bit of rusty metal, neither I nor any member of my family have ever witnessed any injury or even risk of injury from the remaining material in more than 50 years of use. We strongly object to any proposed action other than the "do nothing" option.

With thanks for your consideration,

Christopher C. McIsaac

Clifford Chance US LLP

2001 K Street, NW

Washington, DC 20006

**Public Comment 6:**

My family and I live on Tisbury Great Pond. We are strongly opposed to the proposed project. We are in favor of option 1, no action, no cost. Thank you,

Nancy Eppel 37 Pondview Farm Rd, West Tisbury, MA

**Public Comment 7:**

We are riparian owners on the pond as well as Quansoo beach owners. We strongly oppose the actions the Corps is recommending.

Michael & Dorothy Rodell

**Public Comment 8:**

We are writing to comment on the proposed U.S. Army Corps of Engineers remediation plan for the Tisbury Great Pond Munitions Response Area (Formerly Used Defense Site, Project Number D01MA0453). We are summer residents with property on the pond, and owners of a parcel on the barrier beach.

First, we would like to thank the USACE for addressing the problems of left over munitions in areas that present a safety hazard for the public. We fully support the idea of cleaning up one's mess.

However, it is our understanding that in the almost 70 years that these munitions and debris have been in this area, there has never been any kind of explosion, despite the fact that many of these objects have been found over the years. While that doesn't mean that a problem could not happen in the future, 70 years is a good long time – we, our children, and our grandchildren have been using the pond and the beach for about 25 of those years and we feel safe continuing to use them.

As noted in the report dated June 11, the area in question is designated "Core Habitat" and "Critical Natural Landscape," and is a delicate ecosystem dependent on the integrity of the barrier beach and surrounding dunes. The report notes that no ecological risk is posed by Munitions Constituents at the site. For the purposes of protecting the ecology of this place, it seems clear that leaving it alone is the safest.

We support Alternative 2, Land Use Controls, for remediation. While we accept the determination that there may be some potential for explosions, the risk seems vanishingly small, and outweighed by the damage that would result from remediation work in Alternatives 3 and 4.

Thank you for your consideration of our comments,

Cynthia McGrath

Alden Bumstead

Leslie Bumstead

11 Little Sandy Rd

Chilmark, MA 02535

**Public Comment 9:**

I am writing on behalf of the Black Point Beach Association (B.P.B.A.), whose roughly seventy-five members own nearly three-quarters of a mile of beach front in Chilmark, Massachusetts, from the east end of Black Point Bond to the west end of Quenames Cove, on the island of Martha's Vineyard.

It recently came to the attention of the B.P.B.A. Board that the Army Corps of Engineers is considering several proposals to deal with the possibility that unexploded World War II ordnance might remain on the south shore of Martha's Vineyard in the vicinity of Tisbury Great Pond.

Subsequently the board asked the association's manager to look into the matter. Several board members also studied the various proposals under consideration. And one board member spoke with an elderly lifetime islander and noted island archaeologist

From what the board has learned, we believe that the risk from any possible unexploded ordnance is minimal and by no means serious enough to justify the expenditure of more than $8 million, as called for in alternative 3, and almost $10 million, as called for in alternative 4.

We also believe that these two alternatives would be extremely intrusive and environmentally unsound. And we are especially concerned of their impact on the sand dunes at Black Point Beach, which had taken more than two decades to recover from Hurricane Bob.

Hence we strongly oppose alternatives 3 and 4 and as strongly favor alternative l, which would be to do nothing.

If you need additional information, I can be reached at foge@mit.edu or at 508 645 3742.

Robert M. Fogelson

President, B.P.B.A.

**Public Comment 10:**

We are writing to express our opposition to the Army Corps of Engineers proposal for the Tisbury Great Pond. I have been a member of the riparian owners of the Tisbury Great Pond since 1978. Our family has spent a lot of unforgettable moments on the pond and the barrier beach.

We do not believe that option three or four of the Army Corps of Engineers proposal are indicated. There have been no reports of anyone impacted in the past 70 years from the reported unexploded munitions.

Ms. Jones letter of June 24 eloquently expresses our sentiments about this matter.

We will be retiring next June to our home in West Tisbury. We look forward to enjoying the Tisbury Great Pond without the intervention of the Army Corps of Engineers proposed option three or four.

Yours truly,

Abraham Genack, Kathy Wixon, Jacob Wixon Genack and Jenna Wixon Genack

**Public Comment 11:**

I am writing in regard to the Army Corps of Engineers plan for "subsurface clearance" of the Tisbury Great Pond. Please include this letter in your public responses. I am sorry to have missed the presentation in June.

The pond and beach have been used by my family every year since the 1940's, for hunting, fishing, shellfishing, sailing and swimming. I have read your proposed plan. Although there appears to be a remote risk to human health in the future, none has occurred in the past 70 years of fairly consistent human and animal use, including farming.

I completely disagree that it is necessary to continue looking for unknown unidentified, unseen materials by sifting and digging 5 acres or 33.5 acres or 126 acres of dunes, beach and water. It seems disruptive in the most gross and destructive manner to the local environment, and is unlikely to be adequately "restored" or "revegetated" successfully, as you suggest.

I support option #1, NO ACTION, or, if the TTOR and pond sewers wanted option #2, I might support it too. Spending 8 to 10 million taxpayer dollars to try to find something you are not sure is even there seems utterly insane, absurd, and wasteful beyond belief.

Perhaps the USACE would consider using that money on public education or LUC for climate change remediation, or removal of some of the huge man made barriers that are destroying our coasts.

Laura Murphy

71 Murphy's Rd

Chilmark, Ma 02535

**Public Comment 12:**

I am writing in regard to the Corps of Engineers' plans to remove potential ordnance from the area on Tisbury Great Pond and the adjacent beach and ocean. I am in total agreement with the concerns expressed by the West Tisbury Planning Board in their letter to you. The low risk to

people using the area does not justify the very high risks of damage to a sensitive environment. The project seems extremely ill-advised. I am in full support of Alternative 2, the provision of public information and opposed to the other alternatives.

Victoria Bijur

190 Tiahs Cove Road

West Tisbury, MA

**Public Comment 13:**

When I was young there was a wall/pile of rocks out in the pond, we were told it had been used for target practice during the war. During the 70 years since then the outer beach has been moving inland at a rate of about 8 feet per year, thus moving a total of 560 feet. A few years ago those old stones appeared on the shoreline on the inside of the pond, and have since then been covered by the moving dunes. The rocks were mixed with bits of rusted metal, which must have been remnants of the smoke bombs. This was just to the east of where the opening was a few years back. The openings have recently been located much farther to the west starting another 100 year cycle. When the cut is open it eats its way to the east, earths rotation I think, and slowely moves east until it sort of stalls in the shallower water on the eastern side making the openings not so good.

I believe all the ordinance from that time has been under water for years. The dune is continually reforming with sand being blown toward shore (prevailing wind) and the waves in the ocean banking it up and pushing it toward shore. The dune that was there in 1945 would have been way out in the ocean (560 feet). The original bombs and target rocks are probably under the dune and under water now, and will be in the ocean in the future.

The fact that any UXO has been under water all this time.

The fact that we collected these as children.

The fact that our parents, many war veterans, didn't think that was a problem even then. Probably not such a good idea!

The fact that no one has been hurt in 70 years, unless we haven't been told something.

The fact that these bombs were mainly for spotting not really destroying things.

And,

It's possible that churning up the sand structure will accelerate the advancing beach, and the pond is getting much shallower, and smaller as time goes by. If you look 100 years earlier, Long Cove was still a cove on Tisbury Great Pond. I don't see it as a positive for wildlife either. The issue isn't really whether or not UXO might be dangerous or not. There's no evidence of human harm. How can you justify a program based on no known harm.

This world is full of human threats; the UXO in Laos is a huge problem. Mines have created massive human suffering. I'm sure there are dangerous old military sites in the US. These problems certainly need to be addressed.

The biggest threat here is that in a time when a growing part of the population is pushing hard for smaller/less government, people discover that some special people on Martha's Vineyard are getting protected, at great expense, from some unproven threat.

Alexander Moore

**Lead Agency Response to Public Comments 1-13:**

Out of the 11 comments received from the private landowners of Tisbury Great Pond, there is no support for the proposed remedy, Alternative 4, Subsurface Clearance. Instead, Public Comments 1-11 support either Alternative 1, No Action or Alternative 2, Land Use Controls. USACE, the lead agency, has reviewed the comments and evaluated them against the other stakeholder comments (summarized in the following sections) including the West Tisbury Conservation Commission, West Tisbury Planning Board, MADEP, and TTOR. MADEP and TTOR are in support of Alternative 4, Subsurface Clearance.

Regarding Public Comment 1, individual copies of all reports/documents are located in the repository, and are available for the public to review at their convenience. The PDT evaluated videotaping v. court stenographer/official transcripts, and chose the stenographer/official transcripts to protect the privacy of those who do not wish to be videotaped.

**Stakeholder Comment 1 (West Tisbury Conservation Commission):**

The West Tisbury Conservation Commission has discussed the Corps of Engineers' plans for removing potentially hazardous munitions from the area southeast of Tisbury Great Pond and the adjacent beach and ocean.

The members of the Conservation Commission strongly encourage the Army Corp of Engineers to adopt remedial Alternative 2- Land Use Controls, to manage the risks that have been identified by the recently completed remedial investigation. Given the risk analysis results outlined in the proposal, the low risk to people using the area and the inevitable damage (at least for several years after the project and perhaps for much longer) to the sensitive environment, the project does not seem advisable, particularly given the almost $10 million cost.

Since the end of World War II, the residents around Tisbury Great Pond and visitors to its shores have practiced the Army Corp's 3R's: Recognize Retreat and Report. This system has worked well for more than 60 years and with the increased public awareness campaign contemplated by Alternative 2 this system should continue to work into the future as the coastal bank and beaches around the pond continue to erode and reveal these munitions.

Again, we believe that the project (Alternative 4 in your presentation) is not advisable, and we would support Alternative 2, the provision of public information.

Sincerely,

West Tisbury Conservation Commission

Tara J. Whiting, Co-Chair

**Stakeholder Comment 2 (West Tisbury Planning Board):**

The West Tisbury Planning Board has discussed the Corps of Engineers' plans for removing potential ordnance from the area at the southeast of Tisbury Great Pond and the adjacent beach and ocean. Two of our members attended the session at the West Tisbury Library on June 23rd.

The members of the Planning Board have deep concerns about the wisdom of the proposed project. Given your own risk analysis results, the low risk to people using the area and the inevitable damage (at least for several years after the project and perhaps for much longer) to the sensitive environment, the project does not seem advisable, particularly given the almost $10 million cost. Signs and a public awareness campaign are certainly good ideas and should give the public the information needed to safely use the area.

Again, we believe that the project (Alternative 4 in your presentation) is not advisable, and we would support Alternative 2, the provision of public information.

Members of the West Tisbury Planning Board

**Lead Agency Response to Stakeholder Comments 1-2:**

Alternative 4, Subsurface Clearance will provide the highest level of protection against public exposure to munitions. Restoration of the beach and dune will be performed in coordination with USFWS, MA NHESP, and TTOR to ensure it is complete.

**Stakeholder Comment 3 (TTOR):**

Thank you for this opportunity to comment on the proposed remediation plan for the Tisbury Great Pond Munitions Response Areas. As a key stakeholder and landowner The Trustees of Reservations has witnessed the existence and the exposure this ordnance has on our visitors each year. It is probably true that in my 28 year tenure on the island with The Trustees, we have received at least one report each year of visitors finding practice or live ordnance on the ocean beach and along the shores of Tisbury Great Pond. Many years we have had to post rangers near the beach and opening into Tisbury Great Pond to warn beach-goers to avoid touching the 3- pound, 100-pound and 500- pound practice bombs which are routinely exposed due to normal beach erosion.

We support the US Army Corps of Engineers preferred alternative to remove as much of this ordnance as possible by subsurface clearance and eventual restoration and re-vegetation of the

impacted dunes and beach area. We also support no action in the adjacent waters and land MRS areas as there was a finding of no significant presence of ordnance in those areas.

In the case of the Tisbury Great Pond MRS we would request the continued excellent communication with The Trustees of Reservations which the Corps has made a habit of. We look forward to working with the Corps and its contractors to work towards ridding this recreational and natural resource area of this ordnance.

Christopher P Kennedy

Superintendent, Martha's Vineyard

**Lead Agency Response to Stakeholder Comment 3:**

The Lead Agency recognizes that TTOR is the single largest landowner within the MRS footprint, and is cognizant of the fact TTOR property is used by the public for recreation. Alternative 4, Subsurface Clearance, will provide the highest level of protection against public exposure to munitions.

**Stakeholder Comment 4 (MADEP):**

If MADEP thought this was scrap metal, something that we are not concerned with, we would not go to that effort that we have at this point. But we have pinpointed a particular area along West Tisbury Beach that flushes out on a regular basis, causes release of munitions along the beach, and along the shore. Though they may not look like a perfect Mk-23, they are a hazard. I respect the communities concern that perhaps we don't do anything, but we do have to think of the general public and kids that may pick something up. I have great confidence in the Corps with the other projects they have done in Massachusetts, including restoration of the wetlands, Federal and State endangered species, and the restoration of the dunes. It's all documented by our legal department, and it's part of the record of decision. So if the Corps decides not to come back, they decide not to fund a contract to do it, we come to the table and personally make sure it's done.

**Lead Agency Response to Stakeholder Comment 4:**

Alternative 4, Subsurface Clearance will provide the highest level of protection against public exposure to munitions. Restoration of the beach and dune will be performed in coordination with USFWS, MA NHESP, and TTOR to ensure it is complete.

### 3.2 Access Restrictions

At the finalization of the DD, ROE access to one of the properties within the 123.1 acre Tisbury Great Pond MRS has not yet been granted. If any ROE access has not been granted at the time the Remedial Action is contracted, a new MRS will be created to cover the no access property. Subsurface Clearance will be implemented as described in this DD within the remaining areas of the Tisbury Great Pond MRS. The newly designated MRS will remain unfunded until said ROE

is granted. USACE will contact the property owner at least every five years in an attempt to obtain ROE.

### 3.3 ARARs

The following requirements have been identified as potential ARARs. Only the substantive portions of these provisions meet the definition of an ARAR. Permits, consultations and plans are not included:

321 CMR *10.04(1)* ***Prohibitions. …, no person may take, possess, transport, export, process, sell or offer for sale, buy or offer to buy, nor shall a common or contract carrier knowingly transport or receive for shipment, any plant or animal or part thereof on the state list or federal list; provided, however, that ownership, sale, or purchase of real property on which such plant or animal occurs is not prohibited.***

Several requirements, though not ARAR in themselves, are important to understanding the extent and breadth of 10.04(1) under Massachusetts law and must be adhered to as these are mandatory provisions. These include 321 CMR 10.16(1), 10.17(1) and 10.90.

*a. 10.16(1)* ***Project Segmentation. Projects shall not be segmented or phased to evade or defer the review requirements of 321 CMR 10.13 and 10.18 through 10.23 or the eligibility requirements for an exemption under 321 CMR 10.14. For the purposes of 321 CMR 10.13, 10.14 and 10.18 through 10.23, the entirety of a proposed Project subject to review, including likely future expansions, shall be considered, and not separate phases or segments thereof. In determining whether two or more segments or components are in fact parts of one Project, all circumstances shall be considered, including but not limited to time interval between phases, whether the segments or components, taken together, constitute a part of a common plan or scheme, whether there is a commonality of ownership interests across two or more separate legal entities, whether and whether environmental impacts are separable. Ownership by different entities does not necessarily indicate that two segments or components are separate. …***

*b. 10.17(1)* ***Whether a Project or an Activity is within or encroaches upon a Priority Habitat shall be determined by consulting the Natural Heritage Atlas, which shall be the authoritative delineation of the boundaries of said Priority Habitat.***

*c. 10.23 (see discussion below)*

*d. 10.90 (1)* ***Introduction. The list in 321 CMR 10.90 contains the names of all species of plants and animals which have been determined to be Endangered, Threatened, or of Special Concern pursuant to M.G.L. c. 131A and 321 CMR 10.03.***

The substantive provisions of 321 CMR 10.23 as included below are adopted as ARAR in themselves (and also as an inherent exception to the prohibition in 321 CMR 10.04(1)). Since only the substantive portions of this provision are applicable or relevant and appropriate, permits,

consultations, and plans are not included. As such, where it says "permit" in Section (1) and (7),below, that should be read to mean "allow." In Section (2)(c) and (3), below, "plan" means "actions." In Section (2) the following phrase "Director may issue a conservation and management permit" is understood to mean "the taking is allowed." Further, throughout 321 CMR 10.23 "Applicant" is recognized as the USACE.

***(1) … permit the Taking of a State-listed Species for conservation or management purposes provided there is a long-term Net Benefit to the conservation of the impacted species. …***

***(2) Except as provided in 321 CMR 10.23(6) below, if … the applicant … has avoided, minimized and mitigated impacts to State-listed Species consistent with the following performance standards, … the Director may issue a conservation and management permit provided:***

***(a) The applicant has adequately assessed alternatives to both temporary and permanent impacts to State-listed Species;***

***(b) An insignificant portion of the local population would be impacted by the Project or Activity, and;***

***(c) The applicant agrees to carry out … conservation and management plan … that provides a long-term Net Benefit to the conservation of the State-listed Species … and shall be carried out by the applicant.***

***(3) Except as provided in 321 CMR 10.23(6) below, if a conservation and management … applicant is unable to demonstrate the long-term Net Benefit performance standard on the project site and the applicant has made every reasonable effort to avoid, minimize and mitigate impacts to the State-listed Species on site, then the conservation and management plan … meet the long-term Net Benefit performance standard by providing for financial or in-kind contributions toward the development and/or the implementation of an off-site conservation recovery and protection plan for the impacted species.***

***(4) …***

***(5) …***

***(6) Projects or Activities Eligible for Coverage … when the Division has issued a Conservation Plan***

***(a) …***

***(b) …***

***1. The applicant shall implement and comply with species-specific development standards or best management practices, or both, applicable to the geographic area and the species habitat that would be impacted by the Project or Activity. Notwithstanding 321 CMR 10.23(2), the proponent is not required to provide an alternatives analysis or to demonstrate that an***

***insignificant portion of the local population of the affected State-listed Species of Special Concern would be impacted by the Project or Activity.***

***2. The applicant shall provide off-site mitigation, or a combination of on-site and off-site mitigation subject to the Division's approval, that achieves the long-term Net Benefit standard in 321 CMR 10.23(1), as determined by the Division. Any off-site mitigation provided by the applicant in the form of a financial contribution will be used to fund habitat management or the protection of land or other appropriate mitigation within one or more conservation protection zones established in the conservation plan issued by the Division pursuant to 321 CMR 10.26. The amount of any such off-site mitigation payment will be determined by the Division based on a formula set forth in written guidance that, at a minimum, considers the area of impact on the on-site habitat of the affected State-listed Species of Special Concern and the land values within one or more of the conservation protection zones. Notwithstanding 321 CMR 10.23(3), the applicant may propose off-site mitigation without a showing that the applicant has made every reasonable effort to avoid, minimize and mitigate impacts to the affected State-listed Species of Special Concern on-site.***

***3. …***

***(c) …***

***(7) General Mitigation Standards applicable to Individual and General Conservation and Management Permits issued by the Director.***

***(a) … generally apply the following areal habitat mitigation ratios, based on the category of State-listed Species:***

***1. Endangered Species: 1:3 (i.e., protection of three times the amount of areal habitat of the affected Endangered Species that is impacted by the Project or Activity);***

***2. Threatened Species: 1:2 (i.e., protection of two times the amount of areal habitat of the affected Threatened Species that is impacted by the Project or Activity).***

***3. Special Concern Species: 1:1.5 (i.e., protection of one and one half times the amount of areal habitat of the affected Species of Special Concern that is impacted by the Project or Activity).***

***(b) … A project proponent may also request in writing that the Director apply an alternative mitigation ratio or alternative mitigation approach to the Project or Activity. Any such request shall explain why an alternative mitigation ratio or alternative mitigation approach is appropriate, addressing the relevant factors in 321 CMR 10.23(7)(b)1.-5. below. In determining whether an alternative mitigation ratio or alternative mitigation approach is appropriate, the Director will consider factors that include but are not limited to:***

***1. the size and configuration of the habitat impact;***

***2. the threats to the affected State-listed Species posed by uses or activities located adjacent or in close proximity to the Project or Activity that is the subject of the conservation and management permit;***

***3. the size, configuration and quality of the habitat proposed to be protected by the applicant;***
***4. the population density of the affected State-listed Species; and***

***5. the habitat management and research needs associated with the affected State-listed Species.***
***(c) …***

310 CMR 9.40 (2)(b) (1st sentence) – Though this project does not constitute dredging and, therefore, this requirement is not applicable, this provision was deemed relevant and appropriate.

***The design and timing of dredging and dredged material disposal activity shall be such as to minimize adverse impacts on shellfish beds, fishery resource areas, and submerged aquatic vegetation.***

310 CMR 9.40 (3)(b) (1st sentence) – Though this project does not constitute dredging and, therefore, this requirement is not applicable, this provision was deemed relevant and appropriate based on state representations that this provision is not limiting the scope of the remediation, but rather requires the use of best management practices to minimize "slumping."

***The shoreward extent of dredging shall be a sufficient distance from the edge of adjacent marshes to avoid slumping.***

310 CMR 10.25 (5) Land under the Ocean

***Projects … which affect nearshore areas of land under the ocean shall not cause adverse effects by altering the bottom topography so as to increase storm damage or erosion of coastal beaches, coastal banks, coastal dunes, or salt marshes.***

310 CMR 10.25 (6) Land under the Ocean

***Projects … which affect land under the ocean shall if water-dependent be designed and constructed, using best available measures, so as to minimize adverse effects, …***

310 CMR 10.25 (7) Land under the Ocean

***Notwithstanding the provisions of 310 CMR 10.25(3) through (6), no project may … have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.***

310 CMR 10.27 (3) Coastal Beaches

***Any project on a coastal beach shall not have an adverse effect by increasing erosion, decreasing the volume or changing the form of any such coastal beach or an adjacent or downdrift coastal beach.***

310 CMR 10.27 (6) Coastal Beaches

***In addition to complying with the requirements of 310 CMR 10.27(3) and (4), a project on***

***a tidal flat shall if water-dependent be designed and constructed, using best available measures, so as to minimize adverse effects, …***

310 CMR 10.27 (7) Coastal Beaches

***Notwithstanding the provisions of 310 CMR 10.27(3) through (6), no project may … have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.***

310 CMR 10.28 (3) Coastal Dunes

***Any alteration of, or structure on, a coastal dune or within 100 feet of a coastal dune shall not have an adverse effect on the coastal dune by:***

***(a) affecting the ability of waves to remove sand from the dune;***

***(b) disturbing the vegetative cover so as to destabilize the dune;***

***(c) causing any modification of the dune form that would increase the potential for storm or flood damage;***

***(d) interfering with the landward or lateral movement of the dune;***

***(e) causing removal of sand from the dune artificially; or***

***(f) interfering with mapped or otherwise identified bird nesting habitat***

310 CMR 10.28 (6) Coastal Dunes

***Notwithstanding the provisions of 310 CMR 10.28(3) through (5), no project may … have any adverse effect on specified habitat sites of Rare Species, as identified by procedures established under 310 CMR 10.37.***

310 CMR 10.29 Barrier Beaches – Though this provision does not meet the definition of an ARAR, we are on notice that the other ARAR requirements found in 310 CMR 10 also apply to barrier beaches.

310 CMR 10.33 (3) Land under Salt Ponds

***Any project on land under a salt pond, on lands within 100 feet of the mean high water line of a salt pond, or on land under a body of water adjacent to a salt pond shall not have an adverse effect on the marine fisheries or wildlife habitat of such a salt pond caused by:***

***(a) alterations of water circulation;***

***(b) alterations in the distribution of sediment grain size and the relief or elevation of the bottom topography;***

***(c) modifications in the flow of fresh and/or salt water;***

***(d) alterations in the productivity of plants, or***

***(e) alterations in water quality, including, but not limited to, other than normal fluctuations in the level of dissolved oxygen, nutrients, temperature or turbidity, or the addition of pollutants.***

310 CMR 10.33 (5) Land under Salt Ponds

***Notwithstanding the provisions of 310 CMR 10.33(3) and (4), no project may … have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.***

310 CMR 10.34 (4) Land Containing Shellfish

***(4) Except as provided in 310 CMR 10.34(5), any project on land containing shellfish shall not adversely affect such land or marine fisheries by a change in the productivity of such land caused by:***

***(a) alterations of water circulation;***

***(b) alterations in relief elevation;***

***(c) the compacting of sediment by vehicular traffic;***

***(d) alterations in the distribution of sediment grain size;***

***(e) alterations in natural drainage from adjacent land; or***

***(f) changes in water quality, including, but not limited to, other than natural fluctuations in the levels of salinity, dissolved oxygen, nutrients, temperature or turbidity, or the addition of pollutants.***

310 CMR 10.34(5) Land Containing Shellfish

***(5) Notwithstanding the provisions of 310 CMR 10.34(4), projects which temporarily have an adverse effect on shellfish productivity but which do not permanently destroy the habitat may … [be conducted] if the land containing shellfish can and will be returned substantially to its former productivity in less than one year from the commencement of work.***

310 CMR 10.34 (8) Land Containing Shellfish

***(8) Notwithstanding the provisions of 310 CMR 10.34(4) through (7), no project may … have any adverse effect on specified habitat of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.***

310 CMR 10.35(3) Banks of or Land under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run

***(3) Any project on such land or bank shall not have an adverse effect on the anadromous or catadromous fish run by:***

***(a) impeding or obstructing the migration of the fish, unless DMF has determined that such impeding or obstructing is acceptable, pursuant to its authority under M.G.L. c. 130, § 19;***

***(b) changing the volume or rate of flow of water within the fish run; or***

***(c) impairing the capacity of spawning or nursery habitats necessary to sustain the various life stages of the fish.***

310 CMR 10.35(4) Banks of or Land under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run

(4) … dredging, disposal of Dredged Material or filling in a fish run shall be prohibited between March 15th and June 15th in any year.

310 CMR 10.35(5) Banks of or Land under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie an Anadromous/Catadromous Fish Run

***(5) Notwithstanding the provisions of 310 CMR 10.35(3), no project may … have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.***

310 CMR 10.37 5th paragraph, 1st sentence, Estimated Habitats of Rare Wildlife (for Coastal Wetlands)

***… if a proposed project is found by the issuing authority to alter a resource area which is part of the habitat of a state-listed species, such project shall not … have any short or long term adverse effects on the habitat of the local population of that species.***

310 CMR 10.55 (a) Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs)

***Where the presumption set forth in 310 CMR 10.55(3) is not overcome, any proposed work in a Bordering Vegetated Wetland shall not destroy or otherwise impair any portion of said area.***

310 CMR 10.55 (b) Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs)

***Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of up to 5000 square feet of Bordering Vegetated Wetland when said area is replaced in accordance with the following general conditions and any additional, specific conditions the issuing authority deems necessary to ensure that the replacement area will function in a manner similar to the area that will be lost:***

***1. the surface of the replacement area to be created ("the replacement area") shall be equal to that of the area that will be lost ("the lost area");***

***2. the ground water and surface elevation of the replacement area shall be approximately equal to that of the lost area;***

***3. The overall horizontal configuration and location of the replacement area with respect to the bank shall be similar to that of the lost area;***

***4. the replacement area shall have an unrestricted hydraulic connection to the same water body or waterway associated with the lost area;***

***5. the replacement area shall be located within the same general area of the water body or reach of the waterway as the lost area;***

***6. at least 75% of the surface of the replacement area shall be reestablished with indigenous wetland plant species within two growing seasons, and prior to said vegetative reestablishment any exposed soil in the replacement area shall be temporarily stabilized to prevent erosion in accordance with standard U.S. Soil Conservation Service methods; and***

***7. the replacement area shall be provided in a manner which is consistent with all other General Performance Standards for each resource area in Part III of 310 CMR 10.00.***

310 CMR 10.55 (d) Bordering Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs)

***Notwithstanding the provisions of 310 CMR 10.55(4)(a),(b) and (c), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.***

314 CMR 9.06 (2)(1st sentence) Though this project does not constitute dredging and, therefore, this requirement is not applicable, this provision was deemed relevant and appropriate.

***No discharge of dredged or fill material [in waters of the United States within the Commonwealth can occur] … unless appropriate and practicable steps have been taken which will avoid and minimize potential adverse impacts to the bordering or isolated vegetated wetlands, land under water or ocean, or the intertidal zone.***

314 CMR 9.07 (1)(a)(1st sentence) Though this project does not constitute dredging and, therefore, this requirement is not applicable, this provision was deemed relevant and appropriate.

***No dredging shall … occur unless appropriate and practicable steps have been taken which will first avoid, and if avoidance is not possible then minimize, or if neither avoidance or minimization are possible, then mitigate, potential adverse impacts to land under water or ocean, intertidal zone and special aquatic sites.***