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

REPLY TO
ATTENTION OF

CEMP-CE

14 April 2015

MEMORANDUM FOR US Army Engineer Division, North Atlantic Division CESAD-PD-I (Ajodah) 301 General Lee Ave, Brooklyn, NY 11252

SUBJECT: Approval of the Decision Document for the selected remedial action consisting of Munitions and Explosives of Concern (MEC) subsurface clearance at the Cape Poge Bomb Target Land Munitions Response Site ("Land *MRS*") Project 01, and Cape Poge Bomb Target Inland Water MRS ("Inland Water MRS") Project 02; and No Action at the Cape Poge Bomb Target Remaining Lands MRS ("Remaining Lands MRS") Project 03 within the Former Cape Poge Little Neck Bomb Target Site, Formerly Used Defense Site (FUDS), Property No. D01MA0595, Martha's Vineyard, Massachusetts .

1. Reference CENAD-PD-I email dated 7 April 2015, forwarding and approving memorandum letter dated, 19 March 2015, subject: Request for approval of Cape Poge Little Neck Formerly Used Defense Site (FUDS), Martha's Vineyard, Massachusetts Deceision Document, copy enclosed.

2. The subject Decision Document dated, March 2015 has been reviewed by CECC-E and CEPA-MP.

3. This document presents a selected remedy with a total present worth cost estimate of $8,113,000. It consists of MRS1, MRS2 and MRS3. MRS1 includes clearing the entire 62 acres of subsurface Munitions and Explosives of Concern (MEC) to 3 feet below ground surface. MRS2 includes clearing the entire 172 acres of Inland Water of MEC to approximately 3 feet below the bathymetric surface. MRS3 consists of No Further Action.

4. This Decision Document is approved and forwarded to you, pursuant to DAIM-ZA memo dated 9 September , 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.

Karen J Baker

Encl
Decision Document Packet

KAREN J. BAKER
Acting 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 March 2015

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

SUBJECT: Request for approval of Cape Poge Little Neck Formerly Used Defense Site (FUDS), Martha's Vineyard, Massachusetts Decision Document

1. References:

a) USACE 2014. *Final Remedial Investigation Cape Poge Little Neck Formerly Used Defense Site (FUDS) Property No. D01MA059501, Martha's Vineyard, Massachusetts. June 2014.*

b) USACE 2014. *Final Feasibility Study Cape Poge Little Neck Formerly Used Defense Site (FUDS) Property No. D01MA059501, Martha's Vineyard, Massachusetts. November 2014*

c) USACE 2014. *Final Proposed Plan Cape Poge Little Neck Formerly Used Defense Site (FUDS) Property No. D01MA059501, Martha's Vineyard, Massachusetts. November 2014.*

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 Cape Poge Little Neck FUDS as discussed in the enclosed Cape Poge Little Neck 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. Section 2.12.3 of this Decision Document presents the current present worth cost of $8,100,000. The estimated time to complete remediation, assuming no funding constraints, is approximately two years.

4. The Former Cape Poge Little Neck Bomb Target Site (FUDS Property No. D01MA0595) is located on Chappaquiddick Island, which is within the Town of Edgartown, Dukes County, Martha's Vineyard, Massachusetts. This property contains three MRSs; Land MRS (Project 01) comprising 62 acres, and Inland Water MRS (Project 02) comprising 172 acres and Remaining Lands MRS (Project 03) comprising 115 acres. All three MRSs are addressed in the Decision Document.

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 Remedy is based on the information contained in the Administrative Record for the site and the public's input to the Remedial Investigation /Feasibility Study (RI/FS) and Proposed Plan. Based on the evaluation presented in the Remedial Investigation, Feasibility Study (FS) and the Proposed Plan, and stakeholder and public responses during the Proposed Plan public meeting, the following Alternatives were selected:

- MRS1 - Alternative 4 - Subsurface Clearance. Alternative 4 includes clearing the entire 62 acre MRS of subsurface MEC to 3 feet below ground surface.

- MRS2 - Alternative 3 - Subsurface Clearance: Alternative 3 includes clearing the entire 172 acres of Inland Water MRS of MEC to approximately 3 feet below the bathymetric surface of the Inland Water MRS.

- MRS3 – No Further Action. The Remedial Investigation found no risk within the 115 acres at this MRS and no alternatives were evaluated in the FS.

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 14 November 2014, and presented the plan at a public meeting on 3 December 2014. Questions and comments from the public were recorded for the record. The public comment period ended on 19 December 2014. A number of oral and written comments were received on the preferred alternatives 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 public and property owner overwhelmingly preferred the selected alternatives. Based on this public input, the USACE in consultation with the Mass DEP has selected alternative 4 for the Land MRS and alternative 3 for the Inland Water MRS.

7. The regulatory agency involved with the development and finalization of the Decision Document is the Massachusetts Department of Environmental Protection. A Concurrence letter from the Mass DEP is enclosed. The North Atlantic Division (NAD) has reviewed and concurs with the Decision Document in its entirety.

CENAE-PP-M 19 March 2015
SUBJECT: Request for approval of Cape Poge Little Neck Formerly Used Defense Site (FUDS), Martha's Vineyard, Massachusetts Decision Document

8. Reviewers at the USACE Environment & Munitions Center of Expertise (EMCX) and U.S. Army Technical Center for Explosives Safety (USATCES) have been involved with the review and revision of the Decision Document.

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

CHRISTOPHER J. BARRON
COL, EN
Commanding

4 Encls
1. Decision Document
2. MassDEP Concurrence
3. Staffing Matrix
4. Executive Summary

March 2015

FINAL
DECISION DOCUMENT

FORMER CAPE POGE LITTLE NECK BOMB TARGET
MUNITIONS RESPONSE SITES
MARTHA'S VINEYARD, MASSACHUSETTS

FUDS Property No. D01MA0595
Projects 01, 02, and 03
Contract No. W912DY-04-D-0019
Task Order No. 0006

U. S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT

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FIGURES

TABLES

ACRONYMS

3Rs	recognize, retreat and report
AirMag	airborne magnetometry
ARAR	applicable or relevant and appropriate requirements
bgs	below ground surface
BIP	blow-in-place
CENAE	United States Army Corps of Engineers, New England District
CERCLA	Comprehensive Environment Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
CSM	conceptual site model
DD	Decision Document
DERP	Defense Environmental Restoration Program
DGM	Digital Geophysical Mapping
DMM	discarded military munitions
DoD	United States Department of Defense
EM	electromagnetic
EMI	electromagnetic induction
EP	Engineering Pamphlet
EPA	U.S. Environmental Protection Agency
FDEMI	Frequency Domain Electromagnetic Induction
FS	Feasibility Study
Ft	foot or feet
FUDS	Formerly Used Defense Site
GPS	Global Positioning System
HHRA	Human Health Risk Assessment
IC	institutional control
INPR	Inventory Project Report
LTM	long term management
LUC	land use control
MADEP	Massachusetts Department of Environmental Protection
MA NHESP	Massachusetts Natural Heritage Endangered Species Program
MC	munitions constituents
MD	munitions debris
MDAS	material documented as safe
MEC HA	Interim Munitions and Explosives of Concern Hazard Assessment Methodology
MEC	munitions and explosives of concern
MGFD	munitions with the greatest fragmentation distance
MK	Mark
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MSD	minimum separation distance
msl	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan

NG	nitroglycerin
OE	ordnance and explosives
O&M	operation and maintenance
PA	Preliminary Assessment
PETN	pentaerythrite tetranitrate
RAO	remedial action objective
RI	Remedial Investigation
SLERA	Screening Level Ecological Risk Assessment
TBC	to be considered
TCRA	Time Critical Removal Action
TDEMI	Time Domain Electromagnetic Induction
TMV	toxicity, mobility and volume
TTOR	The Trustees of Reservations
UCL	upper confidence limit
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
USFWS	United States Fish and Wildlife Service
UU/UE	unlimited use and unrestricted exposure
UXB	UXB International, Inc.
UXO	unexploded ordnance
VRH	VRHabilis, LLC

EXECUTIVE SUMMARY

This Decision Document documents the approval of the selected remedial action consisting of Munitions and Explosives of Concern (MEC) subsurface clearance at the Cape Poge Bomb Target Land Munitions Response Site ("Land MRS") Project 01, and Cape Poge Bomb Target Inland Water MRS ("Inland Water MRS") Project 02; and No Action at the Cape Poge Bomb Target Remaining Lands MRS ("Remaining Lands MRS") Project 03, Munitions Response Sites within the Former Cape Poge Little Neck Bomb Target Site, a Formerly Used Defense Site (FUDS), Property No. D01MA0595.

The Former Cape Poge Little Neck Bomb Target Site FUDS acreage is 141 and includes both a Bomb Target and a Calibration Range. MEC has been found beyond the FUDS boundaries with contaminated areas covering approximately 264 acres. This acreage was delineated into the Land MRS comprising 62 acres, and Inland Water MRS comprising 172 acres. The remaining uncontaminated lands were delineated into the Remaining Lands MRS comprising 115 acres.

The Selected Remedy for the Land MRS and Inland Water MRS is Subsurface Clearance. USACE has determined that the response actions selected in this DD for MEC at the Land and Inland Water MRSs are necessary to protect public health, welfare, or the environment from the hazards associated with MEC into the environment, based on the current and intended future use of the MRS.

The Selected Remedies are 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. Funds for the Land MRs and Inland Water MRS are required in Fiscal Year 2015. Once UU/UE is verified, the two projects can be closed out and no additional funds will be needed.

The present worth cost estimate for the Land MRS Alternative 4, the Inland Water MRS Alternative 3, and the Remaining Lands MRS No Action Alternative is $3,075,000, $5,038,000, and $0, respectively. It is estimated that Land MRS Alternative 4 would require approximately 6 months planning and 5 months of field work to implement. It is estimated that Inland Water MRS Alternative 3 would require approximately 6 months planning, and 7 months to implement.

Other potential remedies considered included No Action, LUCs only, and Partial Subsurface MEC Clearance with LUC for the Land MRS and the Inland Water MRS. No other remedies were considered for the Remaining Land MRS since no contamination was found.

1. THE DECLARATION

1.1 Project Name and Location

The Cape Poge Bomb Target Land Munitions Response Site ("Land MRS") Project 01, Cape Poge Bomb Target Inland Water MRS ("Inland Water MRS") Project 02; and the Cape Poge Bomb Target Remaining Lands MRS ("Remaining Lands MRS") Project 03, are located in Dukes County on Chappaquiddick Island, which is within the Town of Edgartown, Martha's Vineyard, Massachusetts. The three MRSs are within the Former Cape Poge Little Neck Bomb Target Site, a Formerly Used Defense Site (FUDS), Property No. D01MA0595.

1.2 Statement of Basis and Purpose

This Decision Document (DD) presents the United States Army Corps of Engineers (USACE) remedial action consisting of Munitions and Explosives of Concern (MEC) subsurface clearance at the Land MRS and Inland Water MRS and No Action at the Remaining Lands MRS.

This DD is a requirement of Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S. Code (USC) § 9617), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), also known as Superfund, and follows the requirements of USACE Engineer Regulation 200-3-1, Formerly Used Defense Site 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 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 Former Cape Poge Little Neck Bomb Target Site.

As the lead agency for remedial activities, USACE is responsible for environmental restoration at the Former Cape Poge Little Neck Bomb Target MRSs 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 Land and Inland Water MRSs, resulted in MEC contamination within the MRS boundaries.

The FUDS property was established in a 30 June 2008 Findings and Determination of Eligibility. In July 2008, USACE established the MMRP project in an Inventory Project Report (USACE, 2008). As a result of establishing a potential MEC hazard in the area, a visual survey was conducted by VRHabilis (VRH) under contract with MADEP in November 2008. The visual survey resulted in the discovery, identification, removal, and storage of practice bomb debris.

In February 2009, USACE, St. Louis District prepared a Preliminary Assessment (PA) for the Former Cape Poge Little Neck Bomb Target Site. The PA was compiled through research and analysis of historical text, maps, and photographs from various archives and records holding facilities. Additionally, property visits and interviews were conducted to collect information concerning the subject property. This assessment was performed to obtain information regarding historical usage of the site.

Between 18 April and 25 September 2009, a Time Critical Removal Action (TCRA) was conducted at the Former Cape Poge Little Neck Bomb Target Area. The removal action was conducted on approximately 46 acres within the site. During clearance operations, no MEC was found, but 127 munitions debris (MD) items were removed to a depth of 1 foot.

The 2011 FUDS Remedial Investigation (RI) conducted in accordance with CERCLA identified MEC in the form of AN-Mark (MK) 23s and a significant amount of MD in the vicinity of the target. During the RI, metallic items were identified within the subsurface of the MRSs and then determined to either pose an explosive hazard or deemed safe. The RI was conducted on upland, shoreline and offshore areas to collect data necessary to determine the nature and extent of potential MEC, MD, and munitions constituents (MCs) resulting from historical military activities conducted within the MRSs.

During the RI, 88 MEC items and 325 MD items were recovered. Recovered items included intact and expended AN-MK23 3-pound practice bombs and the remnants of a 100-pound practice bomb. In the Land MRS, the 83 MEC items and 279 MD items recovered during intrusive investigations during the RI were recovered between 6 inches and 3 feet below ground surface (bgs), with an average depth of recovery observed at 2 ft bgs on land. In the Inland Water MRS, 5 MEC items and 46 MD items were recovered during intrusive investigations during the RI between 1 and 3 feet bgs. No MEC or MD items were identified during intrusive investigations performed in the Remaining Lands MRS.

Sampling performed during the RI assessed MC concentrations in surface and subsurface soil associated with the highest densities of MD and groundwater outside of the MRS boundary to the north where nearby residences have groundwater wells. No explosives or explosive residues were detected above the reporting limits. Levels of metals in soil and groundwater were low and below screening levels established to protect human health. Therefore, no human health risks due to MC were identified during the RI. Zinc was detected in soil at concentrations below the 50th

percentile of natural background and was not found to pose an ecological risk. Antimony and lead were identified in soil above ecological screening criteria but were screened out as a risk by food chain modeling (antimony) and the refined screening level ecological risk assessment (lead). Therefore, no ecological risks were identified during the RI. Due to the lack of risk to human health and the environment, no further action is required for munitions constituents.

The RI results were used to develop the Feasibility Study (FS) that identified remedial objectives and goals for the Land and Inland Water MRSs to protect human health and the environment, and evaluate remedial alternatives to address the type and extent of MEC contamination in the Land and Inland Water MRSs. The recommendations of the FS were used to select a remedy, which was documented in a Proposed Plan (PP) finalized in November 2014, and submitted with an opportunity for public comment (17 November through 19 December 2014). 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 Lands MRS therefore, no action is proposed for the Remaining Lands MRS.

USACE has determined that the response actions selected in this DD for hazards associated with MEC at the Land and Inland Water MRSs 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 Land MRS and Inland Water MRS is Subsurface Clearance. The remedies are 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 at the Land and Inland Water MRSs. This alternative reduces exposure hazards to the public. Specific components of the Selective Remedy (Land MRS Alternative 4 comprising 62 acres) and Inland Water MRS Alternative 3 comprising 172 acres) include:

- environmental coordination;
- brush clearing (where needed);
- digital geophysical mapping and data analysis;
- anomaly reacquisition and resolution;
- MEC removal;
- Munitions Potentially Presenting an Explosive Hazard (MPPEH) disposal (e.g., Blow In Place (BIP);
- Munitions Documented as Safe (MDAS) waste stream treatment (off-site) disposal;
- site restoration;
- post construction vegetation monitoring;
- development and reproduction of training materials; and
- annual sign maintenance.

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 MEC and MC in the Remaining Lands MRS, no action is required.

1.5 Statutory Determinations

The Selected Remedies consisting of Subsurface Clearance for the Land MRS and Inland Water MRS are protective of human health and the environment, comply 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 Remedies represent the maximum extent to which permanent solutions can be used in a practicable manner at the site. The Selected Remedies also satisfy 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 NCP, at 40 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 unlimited use and unrestricted exposure (UU/UE). The Selected Remedies are 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 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 Remedies, the project will be closed out.

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 files for the Land and Inland Water MRSs, and the Remaining Land 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 Site Risks.
- **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 2.12.6 – 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 Decision Document presents the selected response action at the Former Cape Poge Little Neck Bomb Target, located in Dukes County on Chappaquiddick Island, which is within the Town of Edgartown, Martha's Vineyard, Massachusetts.. The U.S. Army Corps of Engineers is the lead agency under the Defense Environmental Restoration Program (DERP) at the Munitions Response Sites (MRSs) Cape Poge Bomb Target – Land MRS, Cape Poge Bomb Target - Inland Water MRS, and Cape Poge Bomb Target – Remaining Lands MRS Formerly Used Defense Site (FUDS), Property No. D01MA0595, Projects 01, 02, and 03 and has developed this Decision Document consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document will be incorporated into the larger Administrative Record file for FUDS Property No. D01MA0595, Projects 01, 02, and 03, which is available for public view at the Edgartown Public Library, 58 North Water Street, P.O. Box 5249, Edgartown, MA 02539. This document, presenting the selected remedies with present worth cost estimate of $3,075,000, $5,038,000, and $0, respectively, is approved by the undersigned, pursuant to Memorandum, DAIM-ZA, September 9, 2003, subject: Policies for Staffing and Approving Decision Documents (DDs), and to Engineer Regulation 200-3-1, FUDS Program Policy.

Approved:

Karen J. Baker

KAREN J. BAKER
Acting Chief, Environmental Community of Practice
Directorate of Military Programs
United States Army Corps of Engineers

13 April 15
Date

2. THE DECISION SUMMARY

This DD has been prepared using the guidance published by the USEPA on preparing remedy selection decision documents. 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 U.S. Congress to clean up contamination on FUDS under the DERP. The USACE is the lead agency for investigating, reporting, making decisions, and taking remedial actions regarding MEC at the MRSs. MADEP is the lead regulatory agency.

2.1 Project Name, Location, and a Brief Description

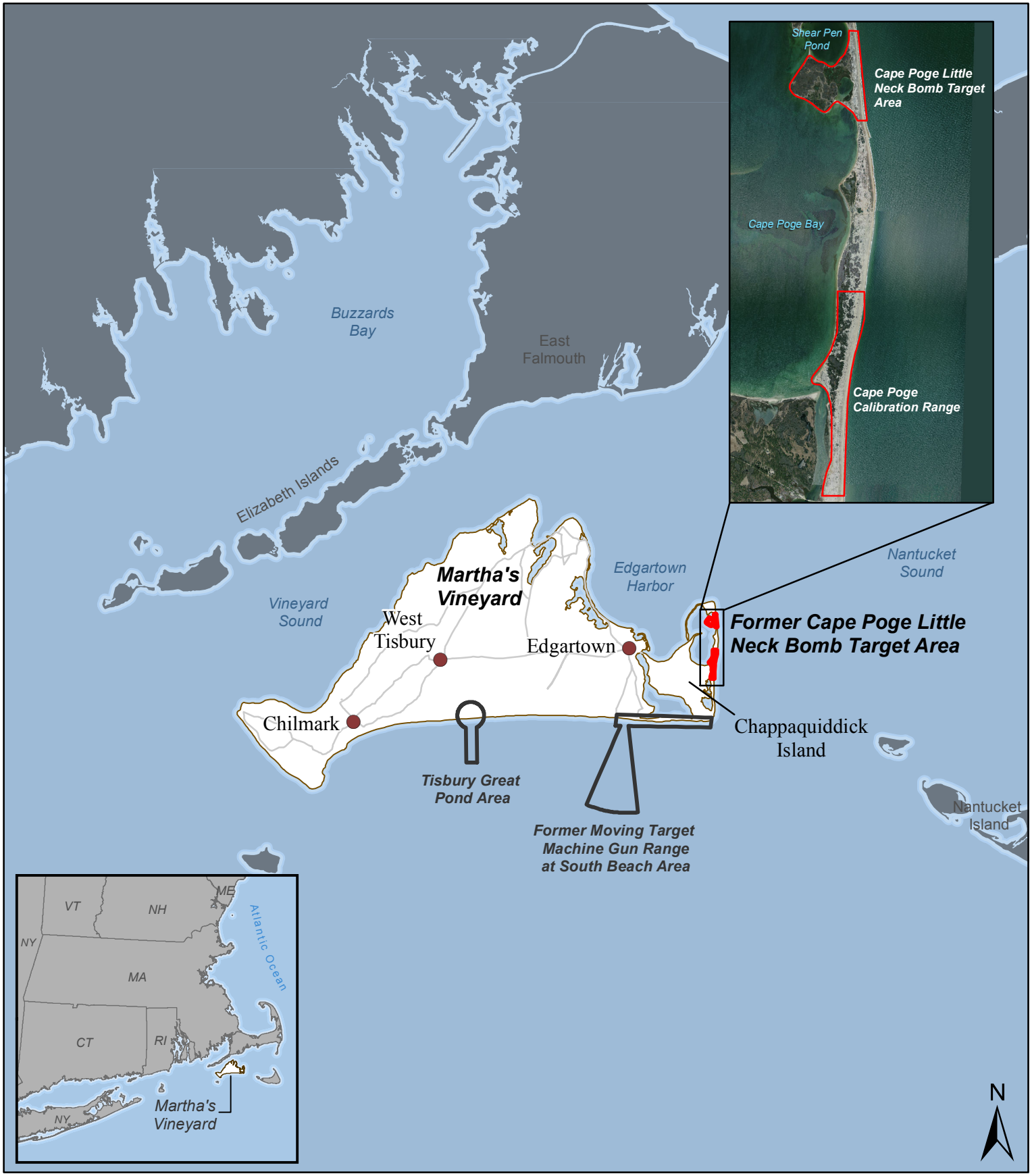
The Former Cape Poge Little Neck Bomb Target Site (FUDS Property No. D01MA0595) is located on Chappaquiddick Island, which is within the Town of Edgartown, Dukes County, Martha's Vineyard, Massachusetts (Figure 2-1). The FUDS acreage is 141 and includes both the Bomb Target and the Calibration Range. MEC contamination has been found beyond the FUDS boundaries and the contaminated areas covering approximately 264 acres. This acreage was delineated in to two MRSs, Land MRS (Project 01) comprising 62 acres, and Inland Water MRS (Project 02) comprising 172 acres. The remaining uncontaminated lands were delineated into the Remaining Lands MRS (Project 03) comprising 115 acres.

The land encompassing the Former Cape Poge Little Neck Bomb Target Site is currently owned by The Trustees of Reservations (TTOR).

2.2 Project MRS History and Enforcement Activities

Between 1944 and 1947, the MRSs were used for day and night practice bombing activities using water-filled bombs, miniature bombs, and flares. Practice bombs were used with signals (also called spotting charges) that would permit pilots to observe bombing accuracy. The signals contained expelling charges and marker charges composed of pyrotechnic mixtures. Upon impact with water or land, the signal would detonate, producing a flash and a large puff of smoke. Since the end of military operations in 1947, practice bombs, primarily consisting of the AN- MK23 containing spotting charges have been identified at the MRSs by the public. The practice bombs that remain at the MRSs present a potential explosive safety hazard.

Prior to the U.S. Navy acquiring leases for the Little Neck bomb target site, Chappaquiddick Island and Cape Poge were used for agricultural purposes and as a summer resort. By March 1944, The U.S. Navy had identified Little Neck as a potential bombing target location. Between 26 June and 4 July 1944, the U.S. Navy constructed a target at the site. By 28 February 1945, the Navy had formally executed the leases for all of the properties at Little Neck with a retroactive start date of 1 July 1944. The leases were acquired for the purpose of a bombing target for the 1st Naval District Flight Training Program at Naval Air Station Quonset Point,



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

06/23/2014	Rev:	CPoge_MV_Island_FS_Poge.mxd
Drawn: JBO	Chk: DMS	PROJ: 562910000

Rhode Island, and the Naval Auxiliary Air Station, Martha's Vineyard, Massachusetts. The 1st Naval District used the site for approximately 2 years before the Chief of Naval Operations approved the discontinuance of the Little Neck target on 15 March 1947.

The First Naval District referenced the site as: L-5-V Little Neck. In February 1945, operations began at the L-5-V Little Neck Site. The site was used for day and night practice bombing activities using water filled bombs, miniature bombs, and flares. The types of munitions potentially used at the bomb target include:

- 100-pound practice bombs, AN-MK15-series;
- Miniature practice bombs, AN-MK5 Mod 1, AN-MK23, AN-MK43;
- Signal practice bombs, AN-MK4 Mods 3 & 4;
- Signal practice bombs, AN-MK6 Mod 0; and,
- Flare, aircraft, parachute, M26 & AN-M26.

On 26 August 1946, bombing activities at L-5-V Little Neck were suspended due to citizen complaints. Although the site remained active, it is not clear whether bombing activities ever resumed before the U.S. Navy approved the discontinuance of the site on 15 March 1947. The leases were terminated on 18 May 1947. Records do not indicate that the property was ever used to store, transport, treat, or dispose of the associated munitions used on property. By 1959, most of Cape Poge property had been donated to The Trustees of Reservations by Charles S. Bird and Oliver D. Filley.

2.2.1 Inventory Project Report

On 6 November 2008, VRH, under contract with MA DEP, conducted a visual ordnance sweep at Little Neck with assistance from TTOR. The visual sweep was conducted to:

- Identify immediate public safety hazards;
- Identify and remove non-hazardous ordnance items or related items (fragmentation, AN-AN-MK23 bodies, etc.) and place the items in secure storage; and
- Identify and remove any non-ordnance items which could be construed as an ordnance item resulting in a response by TTOR, VRH, or law enforcement personnel.

The visual sweep covered approximately 15,300 linear ft of beach, which was approximately 31 ft wide. A Schonstadt metal detection device was used to augment the visual search, clear flooded blast holes, and help qualify unknown items. The visual sweep resulted in the identification, removal, and storage of 15 AN-MK23 fragments, which were safe to move and did not require demilitarization. Additionally, nine metal items (aluminum pieces, lobster pot pieces, aluminum tubing, etc.) were identified, removed, and disposed .

2.2.2 Preliminary Assessment

In February 2009, the USACE, St. Louis District prepared a PA for the Former Cape Poge Little Neck Bomb Target Site. This report was prepared in coordination with the CENAE and the USAESCH. The PA was compiled through research and analysis of historical text, maps, and photographs at various archives and records holding facilities. Additionally, property visits and interviews were conducted to collect information concerning the subject property. Research efforts were directed toward determining the presence of hazardous substances as a result of historical activities performed by the U.S. Navy. This assessment was performed to obtain information for use in developing recommendations for further action at the subject property.

The PA determined that the U.S. Navy utilized practice ordnance at the bombing target. The historical activities at the site included the use of 100-pound water-filled practice bombs with spotting charges, practice miniature bombs with spotting charges, and flares. Visual observations performed during the PA identified residual casings present in surface soil at the site, which may also be present in subsurface soil. Although pyrotechnic signals were constructed in the practice bombs, these constituents are expected to have been released and no longer present in the environment at detectable levels. No evidence was found to indicate that high explosive (demolition) bombs were used at the site.

Based on the findings of the PA, one MRS, L-5-V Little Neck Dive Bombing Target, was confirmed. A MRSPP score was developed for the MRS, which resulted in a ranking of 5 indicating a moderate exposure to explosive hazards is present for the L-5-V Little Neck Dive Bombing Target Site.

2.2.3 Time Critical Removal Action

Between 18 April and 25 September 2009, a TCRA was conducted at the Little Neck Dive Bombing Target Site. The TCRA was performed primarily to remove MEC, MPPEH, and explosive hazards at the site.

The removal action was conducted on approximately 46 acres within portions of the Land and Inland Water MRS. To perform the identification and clearance operations, these 46 acres were subdivided into grids. Within each grid, 5-ft sweep lanes were established for conducting the magnetometer-assisted surface/subsurface/underwater clearance operations using a Schonstedt GA-52Cx magnetometer. All anomalies identified by the magnetometer were investigated and removed using hand tools and mechanical equipment. All MEC, regardless of size, as well as MPPEH, MD, non-MD, and range-related debris equal to or greater than an AN-MK23 practice bomb were removed and/or disposed. During clearance operations, 127 MEC items and 1,916 pounds of non-MD were removed. Items identified and removed included scrap items, AN-MK23, and AN-MK5 practice bombs. No MEC/MPPEH found at the site contained high explosive filler (USACE, 2010).

2.2.4 Remedial Investigation/Feasibility Study

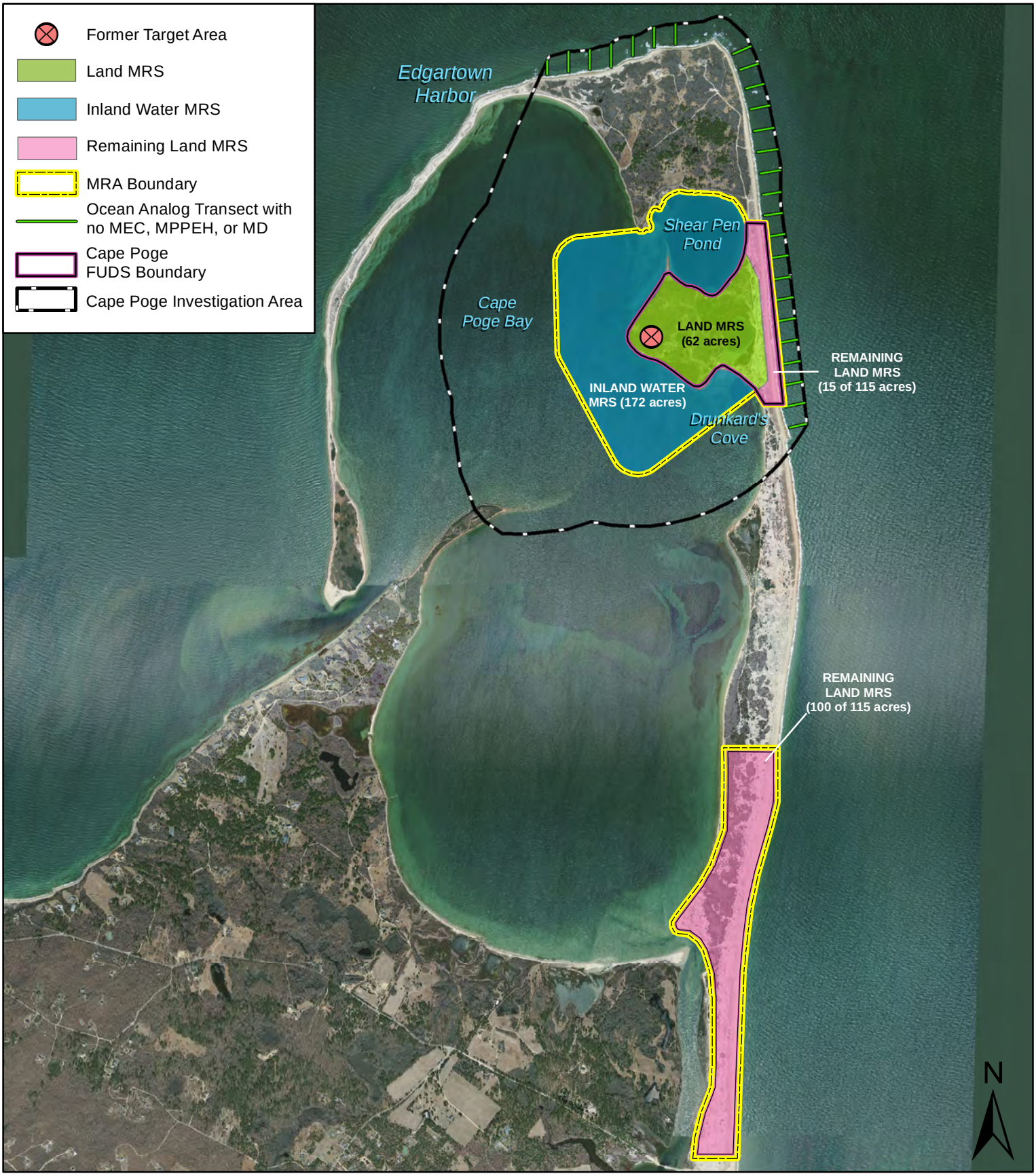
An RI/FS, completed in accordance with the NCP [40 CFR 300.430(d) and (e)], was initiated in 2009 and concluded in 2014. The RI field work was conducted to characterize the nature and extent of MEC and MC of the Former Cape Poge Little Neck Bomb Target Site. The sources of data evaluated as part of the RI to characterize contamination at this MRS 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 *Former Cape Poge Little Neck Bomb Target Site Remedial Investigation Report,* regarding hazards to human health and the environment were used to develop the FS, which was finalized in November 2014.

The RI was conducted on upland, shoreline and offshore areas to collect data necessary to determine the nature and extent of potential MEC, MD, and MC resulting from historical military activities conducted within the Former Cape Poge Little Neck Bomb Target Site. To achieve the RI goals, various field investigative activities were conducted including: geophysical mapping, intrusive investigations, and environmental sampling for analysis for MCs consisting of explosives compounds and metals.

Key findings of the RI include:

- The target area was confirmed through geophysical and intrusive investigations.
- During the RI, a total of 88 MEC items (practice bombs with spotting charges) and 325 MD items were identified.
    - 83 MEC items and 279 MD items were identified within the Land MRS subsurface
    - 5 MEC items and 46 MD items were recovered from the subsurface of the Inland Water MRS.
- MEC and MD items were concentrated on Little Neck around the historic bomb target location.
- MEC and MD were not identified in the residential area north of Shear Pen Pond.
- The beach and ocean areas do not contain MEC or MD.
- Under current conditions, the MEC HA assigned a hazard level category of 2 indicating high potential explosive hazard conditions based upon the spotting charge within the AN-MK23.

The delineation of MEC and MD was completed in November 2014, resulting in three MRSs and individual FUDS projects, comprising the Land MRS (62 acres), the Inland Water MRS (172 acres), and the Remaining Lands MRS (115 acres) (Figure 2-2).



US Army Corps of Engineers

FIGURE 2-2
Site Map
Poge Little Neck Bomb Target, Martha's Vineyard, MA

0 250 500 1,000 1,500 Meters

0 650 1,300 2,600 3,900 5,200 Feet

UXB amec

NOTES:
2009 Aerial Data
Source: MassGIS

08/28/2014	Rev:	CPoge_Revised_MRS_FS_Poge.mxd
Drawn: JBO	Chk: DMS	PROJ: 562910000

A No Further Action recommendation was made for the Remaining Lands MRS (FUDS Property No. D01MA0595, Project 03) at the completion of the RI and was not carried forward to an FS. There is no evidence or history of MEC within the Remaining Lands MRS. Additionally, the RI concluded that only remedial alternatives for MEC would be developed and evaluated since risk from MC was determined to be negligible.

At the completion of the RI, a FS was recommended for the Land MRS and the Inland Water MRS. 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, Former Cape Poge Little Neck Bomb Target Munitions Response Area*, and summarized in the *Final Proposed Plan, Former Cape Poge Little Neck Bomb Target*. 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, fact sheets, public notices, and public meetings.

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 Land MRS, Inland Water MRS, and Remaining Lands MRS was released for public comment on 17 November 2014. The PP and the RI/FS reports are available to the public in the Information Repository, located in the Edgartown Public Library, 216 58 North Water Street, P.O. Box 5249, Edgartown, MA 02539; 508-627-4221.

The public comment period was 17 November to 19 December 2014. Comments were received by USACE during this time. A public meeting was held on 3 December 2014 at the Edgartown Town Hall, 70 Main Street, Edgartown, MA, to present the PP, to answer questions, and solicit comments from the public. Representatives from USACE and its' contractor; TTOR; and MADEP attended the meeting. The notification for the PP meeting and public comment period was published in the Vineyard Gazette on 14 November 2014 and the Martha's Vineyard Times on 20 November 2014.

2.4 Scope and Role of Response Action

This DD authorizes the Selected Remedies to address MEC contamination at the Land and Inland Water MRSs. The Selected Alternatives consist of subsurface clearance to a 3 foot depth in soil and sediment for the Land MRS and subsurface clearance to a 3 foot depth in sediment for the Inland Water MRS. 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 Land and Inland Water MRSs. Detailed information about the MRS characteristics, the site conceptual model, and the nature and extent of contamination is presented in the *Final Remedial Investigation Report Former Cape Poge Little Neck Bomb Target Site Investigation Area.*

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 Former Cape Poge Little Neck Bomb Target Site can generally be described as relatively flat with elevations ranging from 0 to approximately 24 ft above mean sea level (msl). Interdunal swales are found in small depressions in the upland areas. The swales are ephemeral and form when winds scour sand until the water table is reached.

2.5.1.3 Soil Conditions

The soils within the MRSs include the upland soils, Udipsamments and Carver loamy coarse sand, and the marsh area soils, Pawcatuck and Matunuck mucky peats. The upland soils are found on sand dunes, outwash plains, and terminal moraines. These soils are coarse textured, very deep, and excessively drained. These soils have rapid to very rapid permeability and depth

to seasonal high water tables are greater than 6 ft. The marsh area soils are very deep, poorly drained soils in tidal areas subject to daily inundation. These soils are typically adjacent to shore areas and brackish ponds and have a surface layer that is approximately 2 ft thick consisting of an organic peat. Under the organic layer is a substratum consisting of coarse sand that is greater than 5 ft thick. The permeability of these soils is moderate to rapid in the organic material and very rapid in the substratum. The daily tidal flooding limits these soils for most uses other than wetlands.

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 and soil, 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

Soils in the upland areas and on the beaches are excessively drained and have very high permeability. Due to these properties, there is very little to no surface water runoff in these areas. In low-lying areas, such as marshes, the soils are poorly drained and inundated due to tidal changes on a daily basis. Surface water in these areas drains into larger bodies of water, such as Shear Pen Pond, Cape Poge Bay, and the Atlantic Ocean.

2.5.1.6 Groundwater Hydrology

The principal aquifers on Martha's Vineyard are moraines and outwash deposits, which derive their water from local precipitation. Bedrock is much less permeable than the overlying sediments, commonly contains seawater, and is not considered part of the aquifers of Martha's Vineyard.

On Cape Poge, the water table generally mimics topography and is 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. Depth to groundwater ranges from greater than 6 ft below ground surface (bgs) in upland soils to near ground surface in lower areas near shorelines and marshes. The shallow freshwater aquifer is underlain by

brackish water that is unsuitable for human consumption. There is no freshwater underlying the historic target area at Little Neck.

2.5.1.7 Sensitive Species, Environments, and Environmental Resources

The Land and Inland Water MRSs include two habitat types: upland habitat and inland water. These areas provide habitat to a variety of plants, invertebrates, herbivores, predators, and marine receptors. On 17 March 2011, a botanist conducted a sensitive plant survey of the upland target area of Little Neck prior to its sampling. No rare or endangered plants were observed during the survey. The lowest, intertidal estuarine areas were found to be dominated by salt-meadow cordgrass (*Spartina patens*), salt-marsh cordgrass (*S. alterniflora*), salt grass (*Distichlis spicata*), and glasswort (*Salicornia* sp.). Above these areas was an estuarine, broad-leaved deciduous scrub shrub vegetation dominated by groundsel-bush (*Baccharis halimifolia*), which was found in dense thickets throughout Little Neck. Also present in the vegetation were northern bayberry (*Myrica pennsylvanica*), poison sumac (*Toxicodendron vernix*), poison ivy (*Toxicodendron radicans*),Virginia rose (*Rosa virginiana*), grape (*Vitis* sp.), and Oriental bittersweet (*Celastrus orbiculata*). Maritime marsh-elder (*Iva frutescens*) formed a fringe around these estuarine wetlands. Above these areas (in the driest parts of Little Neck upland habitat), eastern red cedar (*Juniperus virginiana*) was the most common species, with a few individuals of scrub oak (*Quercus ilicifolia*) along with Virginia creeper (*Parthenocissus quinquefolia*) common yarrow (*Achillea millefolium*), and switch grass (*Panicum virgatum*).

The waters surrounding Cape Poge are known for an abundance of wildlife, fishing and shellfishing. Striped Bass (*Morone saxatilis*), Bluefish (*Pomatomus saltatrix*), and False Albacore (*Euthynnus alletteratus*) are known to congregate in the waters of Cape Poge Bay (where the Inland Water MRS is located) during the spring, summer and fall. The eelgrass (*Vallisneria Americana)* beds of Cape Poge Bay support a high-quality bay scallop population, which are typically harvested in the fall. The MRSs contain significant ecological resources and is potential habitat for threatened, endangered, or other sensitive or protected species. The MRSs are mapped as "Core Habitat" and "Critical Natural Landscape" by the MA NHESP BioMap2 town report for Edgartown. 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 MRSs are within Core Habitat area 102 and Critical Natural Landscape area 45.

The MRSs have been designated as a Priority Habitat 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 Priority Habitats may result in a take of a state-listed species, and is subject to regulatory review by the NHESP. Priority habitat maps are based on known occurrence of rare species and habitat considerations. The MRSs are mapped as PH 15. Based upon coordination with the U.S. Fish and Wildlife Service (USFWS), National

Marine Fisheries Service, and MA NHESP; there are approximately 37 federal and state threatened, endangered, and special concern species that have been observed on Martha's Vineyard (Table 2-1). Table 2-2 summarizes the observed species found within the MRSs. These include piping plover (*Charadrius melodus*) a federally threatened species which utilizes beach and nearby upland habitat, and the federally endangered roseate tern (*Sterna dougallii*). State listed species include many insect and plant species which utilize upland coastal sandplain habitat.Table 2-1. Endangered, Threatened, and Special Concern Species

Land and Inland Water MRSs

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 caretta*	Threatened	Threatened
Kemp's Ridley Sea Turtle	*Lepidochelys kempi*	Endangered	Endangered
Insects			
Northeastern beach tiger beetle	*Cicindela dorsalis 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	--

Common Name	Scientific Name	State Status	Federal Status
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	--
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	--

Note:
This list was obtained from the RI Work Plan.
-- Stuts not listed

Table 2-2. Observed Species within Former Cape Poge Little Neck Bomb Target MRSs

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	During the 2009 breeding season, 7 pairs of piping plover bred on Cape Poge Refuge	Final TCRA After Action Report (March 2010)
Roseate Tern (Sterna dougallii)	Yes	Yes	Yes	Yes	15 pairs nested along the southern shore of Shear Pen Pond in 1982. The colony was flooded out and the site occupied by nesting gulls in 1984.	Email Chris Buelow, TTOR (27 Oct 2010)

2.5.2 Nature and Extent of Munitions and Explosives of Concern

During the RI, 88 MEC items and 325 MD items were recovered. Recovered items included intact and expended AN-MK23 3-pound practice bombs and the remnants of a 100-pound practice bomb. Within the Land MRS, the 83 MEC items and 279 MD items recovered during RI intrusive investigations were recovered between 6 inches and 3 feet below ground surface (bgs), with an average depth of recovery observed at 2 ft bgs on land. No MEC or MD was recovered from the surface of the Land MRS. Within the Inland Water MRS, 5 MEC items and 46 MD items were recovered during intrusive investigations during the RI between 1 and 3 feet bgs. No MEC or MD was recovered from the surface of the Inland Water MRS.

2.6 Current and Potential Future Land Use

Currently, the Land MRS is owned by TTOR and the Inland Water MRS is owned by the Commonwealth of Massachusetts. Current land use within the MRSs includes a number of recreational activities and commercial activities with potential receptors including the general public, TTOR employees or their contractors. The areas are primarily undeveloped. Current activities include surface and subsurface soil disturbance. Recreational use would typically involve foot and vehicle traffic, with limited intrusive activities (e.g., children digging in the sand, camping) within the Land MRS and recreational and commercial fishing, clamming, and scalloping within the Inland Water MRS where sediment may be dug into by hand or mechanically dredged. It is anticipated that the future land use will remain the same.

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 Land and Inland Water MRSs is ahazard 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. Explosive hazards for the Land and Inland Water MRSs were evaluated in accordance with the 2008 *Interim Munitions and Explosives of Concern Hazard Assessment Methodology* (MEC HA), designed to be used as the CERCLA hazard assessment methodology for MRSs where there is an explosive hazard from the known or suspected presence of MEC. The MEC HA was used to evaluate the baseline hazard associated with the MRS based on the nature and extent of MEC and exposure hazards related to the current use identified during the RI. Subsequently, the MEC HA methodology was used to facilitate the evaluation of remedial alternatives by adjusting the input parameters to account for the potential effects of remedial alternative implementation.

The MEC HA is structured around three components of a potential explosive hazard incident:

- **Severity** – The potential consequences (e.g., death, severe injury, property damage, etc.) of MEC detonating.

- **Accessibility** – The likelihood that a receptor will be able to come in contact with MEC.
- **Sensitivity** – The likelihood that a receptor will be able to interact with MEC such that it will detonate.

Each of these components is assessed in the MEC HA by input factors that consider a set of site conditions, including the types of munitions and how they were used with the current and proposed activities at the site. Each input factor has two or more categories. Each input factor category is associated with a numeric score that reflects the relative contributions of the different input factors to the MEC HA. The sum of the input factor scores falls within one of four defined ranges, called Hazard Levels. Each of the four Hazard Levels reflect attributes that describe groups of MRS and site conditions ranging from the highest to lowest hazards. The MEC HA hazard levels and maximum and minimum score ranges are as follows:

- **Hazard Level 1** – Sites with the highest hazard potential. Instances of an imminent threat to human health from MEC may exist. The hazard level score ranges between a maximum score of 1,000 to a minimum score of 840.
- **Hazard Level 2** – Sites with a high hazard potential. Surface MEC may exist at the site or intrusive activities being conducted may increase the hazard of encountering MEC in the subsurface. The site has moderate or greater accessibility by the public. The hazard level score ranges between a maximum score of 835 to a minimum score of 725.
- **Hazard Level 3** – Sites with a moderate hazard potential. A site that would be considered safe for the current land use without further munitions responses, although not necessarily suitable for reasonable anticipated future use. Level 3 areas generally have restricted access and few contact hours. Typically, MEC is present only in the subsurface. The hazard level score ranges between a maximum score of 720 to a minimum score of 530.
- **Hazard Level 4** – Sites with a low hazard potential. The site is compatible with current and reasonably anticipated future use. Typically, a site does not pose a risk due to no munitions being found, or following a MEC cleanup. The hazard level score ranges between a maximum score of 525 to a minimum score of 125.

Under current conditions, the Land and Inland Water MRSs received a hazard level category of 2, indicating high potential explosive hazard conditions are present.

There is no MEC hazard present within the Remaining Lands MRS.

2.8 Remedial Action Objectives

The RAO established for the Land MRS is to protect recreational users, visitors, and workers at the MRS from explosive hazards associated with MEC exposure in the top three feet of soil during intrusive activities and by wave action/dune erosion. The RAO established for the Inland Water MRS is to protect recreational users, visitors, shell fisherman and other workers at the

MRS from explosive hazards associated with MEC exposure in the top three feet of sediment during intrusive activities.

The RAOs provide protection to human health and the environment 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 Land 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 Alternative 1, the government would take no action with regard to locating, removing, and disposing of any potential MEC present within the Land MRS.
- Alternative 2 – LUCs: The alternative involves the implementation of a LUCs based on public awareness and education components to provide a means to reduce MEC encounters by workers and 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 hazards to 3 feet below ground surface in the open areas of the Land MRS (31 acres) including the dunes along the Land MRS boundary. LUCs would be implemented on the remaining 31 areas that are heavily vegetated.
- Alternative 4 – Subsurface Clearance. Alternative 4 includes clearing the entire 62 acre MRS of subsurface MEC to 3 feet below ground surface.

The following remedial alternatives were developed and were evaluated for the Inland Water MRS:

- Alternative 1 – No Action: Same as the no action alternative for the Land MRS.
- Alternative 2 – LUCs: Same description as LUCs for the Land MRS.
- Alternative 3 – Subsurface Clearance: Alternative 3 includes clearing the entire Inland Water MRS of MEC to approximately 3 feet below the bathymetric surface of the Inland Water MRS.

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 Land 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.

For the Inland Water MRS, Alternative 1 meets the requirement for a no action alternative. Alternative 2 meets the requirement for an alternative with LUCs, and Alternative 3 meets the requirement for an alternative which will achieve UU/UE.

Detailed documentation describing the development of each of the five alternatives with the results of the detailed and comparative analyses conducted as part of the FS are available for review in the Administrative Record in the *Final Feasibility Study, Former Cape Poge Little Neck Bomb Target Site 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:

Land MRS 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 education 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 Land MRS would occur. There would be no ***applicable or relevant and appropriate requirements (ARARs)*** associated with this alternative. **Cost - $0**

Land MRS Alternative 2 – Land Use Controls

Alternative 2 would consist of various ***land use control (LUC)*** components to prevent humans from encountering MEC remaining at this MRS. LUCs for this MRS 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 owner (TTOR), 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. **Cost - $894,000**

Land MRS Alternative 3 – Partial Subsurface Clearance with LUCs

Alternative 3 includes removal of subsurface MEC to approximately 3 feet below ground surface in the open areas of the Land MRS (31 acres) where ground surface is accessible (excludes portions of the MRS with dense woody vegetation), including within the dunes along the Land MRS boundary. LUCs would be implemented on the remaining 31 areas that are heavily vegetated, as described in Alternative 2. Four ARARs were identified for this alternative prior to the Proposed Plan: RCRA Subpart X, 40 CFR 264.601; Federal Endangered Species Act, 16 U.S.C. §1538(a)(1); Massachusetts Endangered Species Act 321 CMR 10.04 (1) and (2); and Massachusetts Waterways Resource Protection Requirements 310 CMR 9.40(2)(b). Untreated MEC in the heavily vegetated area would potentially require offsite disposal on a long-term basis as MEC remaining in the heavily vegetated area would be exposed due to erosion of the dunes and require disposal on a long-term basis as MEC items are discovered by the public. It is estimated that Land MRS Alternative 3 would require approximately 6 months planning and 4 months of fieldwork to implement. Land MRS Alternative 3 would be implemented to comply with the identified ARARs. This alternative would also include LUC components and would require Five Year Reviews. **Cost - $2,563,000. See Responsiveness Summary Section 3.1.2 and Updated ARAR Table 2-3.**

Land MRS Alternative 4 – Subsurface Clearance Alternative 4 includes subsurface remediation of MEC to 3 feet below ground surface over the entire 62 acre MRS. While this subsurface clearance is ongoing, interim LUCs (posting signs at public access locations and distribution of brochures and fact sheets notifying the public of explosive safety hazards when encountering MEC and Army's 3Rs policy (i.e., Recognize, Retreat, Report), and an educational component to provide site-specific awareness training for the local community) will be implemented. 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.

Four ARARs were identified for this alternative prior to the Proposed Plan: RCRA Subpart X, 40 CFR 264.601; Federal Endangered Species Act, 16 U.S.C. §1538(a)(1); Massachusetts Endangered Species Act 321 CMR 10.04 (1) and (2); and Massachusetts Waterways Resource Protection Requirements 310 CMR 9.40(2)(b). It is estimated that Land MRS Alternative 4 would require approximately 6 months planning and 5 months of field work to implement. Land MRS Alternative 4 would be implemented to comply with the identified ARARs. **Cost - $3,075,000. See Responsiveness Summary Section 3.1.2 and Updated ARAR Table 2-3.**

Inland Water MRS Alternative 1 – No Action

The No Action alternative for the Inland Water MRS is similar to the Land MRS Alternative 1 as described previously. **Cost - $0**

Inland Water MRS Alternative 2 – Land Use Controls

The Land Use Controls alternative for the Inland Water MRS is similar to the Land MRS Alternative 2 as described previously. **Cost - $894,000**

Inland Water MRS Alternative 3 – Subsurface Clearance

Alternative 3 includes subsurface remediation of MEC to 3 ft below sediment surface (pond floor) over the entire 172 acre MRS. Since eelgrass, a sensitive habitat, is known to exist within the Inland Water MRS, this alternative will require coordination with TTOR and MA NHESP.

After completion of the subsurface clearance, LTM would continue at this MRS to include post-construction vegetation monitoring, awareness components such as posting signs at public access locations and distribution of brochures and fact sheets notifying the public of explosive safety hazards when encountering MEC and Army's 3Rs policy (i.e., Recognize, Retreat, Report), and an educational component to provide site-specific awareness training for the local community.

Four ARARs were identified for this alternative prior to the Proposed Plan: RCRA Subpart X, 40 CFR 264.601; Federal Endangered Species Act, 16 U.S.C. §1538(a)(1); Massachusetts Endangered Species Act 321 CMR 10.04 (1) and (2); and Massachusetts Waterways Resource Protection Requirements 310 CMR 9.40(2)(b). Inland MRS Alternative 3 would be implemented to comply with the identified ARARs. It is estimated that Inland Water MRS Alternative 3 would require approximately 6 months planning, and 7 months to implement. 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. **Cost - $5,038,000. See Responsiveness Summary Section 3.1.2 and Updated ARAR Table 2-3.**

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 pertain to the site, or whether a waiver is justified. The ARARs identified for the Land and Inland Water MRS alternatives are summarized in Table 2-3.

1 **Table 2-3. ARARs identified for Land and Inland Water MRS Alternatives**

Applicable or Relevant and Appropriate Requirements	Land MRS				Inland Water MRS		
	Alternative 1 No Action	Alternative 2 LUCs	Alternative 3 Partial Subsurface Clearance with LUCs	Alternative 4 Subsurface Clearance	Alternative 1 No Action	Alternative 2 LUCs	Alternative 3 Partial Subsurface Clearance with LUCs
16 U.S.C. §1538(a) (1), Federal Endangered Species Regulations	-	-	✓	✓	-	-	✓
40 CFR 264.601, Resource Conservation and Recovery Act, Miscellaneous Units	-	-	✓	✓	-	-	✓
321 CMR 10.04 (1), Massachusetts Endangered Species Act Regulations	-	-	✓	✓	-	-	✓
321 CMR 10.23 (1), (2), (3), (6)(b)(1), (6)(b)(2), (7)(a), (7)(b)	-	-	✓	✓	-	-	✓
310 CMR 9.40 (2) (b) (1st sentence)	-	-	✓	✓	-	-	✓
310 CMR 9.40 (3) (b) (1st sentence)	-	-	✓	✓	-	-	✓
310 CMR 10.25 (5) Land under the Ocean	-	-	-	-	-	-	✓
310 CMR 10.25 (6) Land under the Ocean	-	-	-	-	-	-	✓
310 CMR 10.25 (7) Land under the Ocean	-	-	-	-	-	-	✓
310 CMR 10.27 (3) Coastal Beaches	-	-	✓	✓	-	-	✓
310 CMR 10.27 (6) Coastal Beaches 310 CMR 10.27 (7) Coastal Beaches	-	-	✓	✓	-	-	✓
310 CMR 10.28 (3) Coastal Dunes	-	-	✓	✓	-	-	✓
310 CMR 10.28 (6) Coastal Dunes	-	-	✓	✓	-	-	✓
310 CMR 10.32 (3) Salt Marshes	-	-	✓	✓	-	-	✓
310 CMR 10.32 (6) Salt Marshes	-	-	✓	✓	-	-	✓
310 CMR 10.33 (3) Land under Salt Ponds	-	-	✓	✓	-	-	✓

Applicable or Relevant and Appropriate Requirements	Land MRS				Inland Water MRS		
	Alternative 1 No Action	Alternative 2 LUCs	Alternative 3 Partial Subsurface Clearance with LUCs	Alternative 4 Subsurface Clearance	Alternative 1 No Action	Alternative 2 LUCs	Alternative 3 Partial Subsurface Clearance with LUCs
310 CMR 10.33 (5) Land under Salt Ponds	-	-	✓	✓	-	-	✓
310 CMR 10.34 (4) and (5) Land Containing Shellfish	-	-	✓	✓	-	-	✓
314 CMR 9.06 (2) (1st sentence)	-	-	✓	✓	-	-	✓
314 CMR 9.07 (1)(a) (1st sentence)	-	-	-	-	-	-	✓

No ARARs were identified associated with Alternatives 1 or 2. ARARs consist of substantive provisions only. For the alternatives involving clearance activities, 40 CFR Part 264, Subpart X would be an ARAR if MPPEH or confirmed MEC items are identified requiring on-site disposal operations, and if a 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 alternatives since threatened and endangered species have been observed at the site. See Responsiveness Summary, 3.1.2. for further explanation of substantive provisions 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 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 (MADEP) may have regarding each of the alternatives evaluated in this DD. State acceptance of the alternatives was evaluated during the Proposed Plan 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 Proposed Plan public comment period.

2.10.1 Comparative Analysis of Land MRS Alternatives

1. **Overall Protectiveness of Human Health and the Environment** – Because MEC was identified during the RI in the subsurface, and the MEC HA estimated an explosive hazard is anticipated to be present at the Land 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 through LUCs. Alternative 3 provides protectiveness as MEC would be destroyed throughout the accessible portion of the MRS (31 acres) and would control exposure through LUCs for the remaining 31 acres of the MRS. Alternative 4 is protective of human health because subsurface MEC would be destroyed from the entirety of the MRS. 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. Fieldwork 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 MRSs 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 accessible portion of the MRS (31 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 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 treatment 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 3 to 6 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 a larger area and removal of heavily vegetated areas within the MRS. Specific activities, including development of awareness training materials for workers and use of protection procedures and mitigation techniques would be required to preserve environmental resources during Alternatives 3 and 4.

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

    - Alternative 1 = $0
    - Alternative 2 = $894,000
    - Alternative 3 = $2,563,000
    - Alternative 4 = $3,075,000

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

2.10.2 Comparative Analysis of Inland Water MRS Alternatives

1. **Overall Protectiveness of Human Health and the Environment** – Alternative 1 would not eliminate, reduce, or control the threat of human exposure to MEC; therefore it does not meet the threshold criteria and cannot be considered further. Alternative 2 would be protective since it controls exposure through LUCs. Alternative 3 is protective of human health because subsurface MEC from the entirety of the MRS would be destroyed. Risks to the environment associated with Alternative 3 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. Alternative 3 would be implemented and performed to comply with all ARARs.

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. Alternative 3 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 hazards.

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 highly effective in reducing the TMV of MEC because all detectable MEC throughout the entirety of the MRS would be destroyed and it would satisfy the statutory preference for treatment as a principal element of the remedy.

5. **Short-Term Effectiveness** – Alternatives 1 and 2 would not present significant additional hazards to the public or workers at the MRS since no construction activities are associated with either alternative. Alternative 3 would increase exposure to hazards 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 treatment on-site to render the item MDAS. The time durations required to implement Alternative 2 is estimated at 3 months. Alternative 3 would require approximately 7 months to implement the field work.

6. **Implementability** – Alternatives 1 and 2 would both be easily implementable. Alternative 3 would also be implementable, but would require considerably more effort and manpower than Alternatives 1 and 2. Underwater subsurface clearance technologies are proven and were successfully implemented within the MRS during the RI. Alternative 3 will require UXO-trained divers along with marine excavation equipment (i.e. marine excavator) to implement. Specific activities, including the development of

awareness training materials for workers and use of protection procedures and mitigation techniques would be required to preserve environmental resources during Alternative 3.

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

- Alternative 1 = $0
- Alternative 2 = $894,000
- Alternative 3 = $5,038,000

Note: Costs have been rounded to the nearest thousand dollars. Costs provided here include Remedial Alternative Costs plus 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. A few comments received from the public regarding the remedial action for the Land and Inland Water MRSs have been presented and reflect a range of concerns. In the comments, individuals expressed concern over revegetation activities and the effect the remedial action will have on erosion, scheduling inland water fieldwork to avoid the scallop harvest and minimizing effects on the extensive eelgrass habitat, and a request to remove all MEC and MD from the MRS.

2.10.3 Comparative Analysis Summary

Table 2-4 presents the comparative summary of the detailed analysis of the alternatives for the Land and Inland Water MRSs. For both MRSs, the Subsurface Clearance of the entirety of each MRS most favorably meets all of the evaluated detailed analysis criteria as compared to other alternatives. While the complete subsurface clearance alternatives would require the most manpower and time to implement, they would provide the highest level of protectiveness over the long-term and will achieve the RAO of protecting recreational users, visitors, and workers at the MRSs from explosive hazards associated with MEC exposure in the top three feet of subsurface soil or sediment during intrusive activities and by wave action/dune erosion.

Table 2-4. Comparative Summary of Detailed Analysis of Remedial Alternatives

Criteria		Land MRS Alternatives				Inland Water MRS Alternatives		
		Alternative 1: No Action	Alternative 2: LUCs	Alternative 3: Partial Subsurface Clearance with LUCs	Alternative 4: Subsurface Clearance	Alternative 1: No Action	Alternative 2: LUCs	Alternative 3: Subsurface Clearance
Threshold	Overall Protection of Human Health and Environment	●	●	●	●	●	●	●
	Compliance with ARARs	●	●	●	●	●	●	●
Balancing	Long-Term Effectiveness	●	◐	◐	●	●	◐	●
	Reduction of TMV through Treatment	●	●	◐	●	●	●	●
	Short-Term Effectiveness	●	●	◐	◐	●	●	◐
	Implementability	●	●	●	●	●	●	●
	Cost[1]	$0	$894,000	$2,563,000	$3,075,000	$0	$894,000	$5,038,000
Modifying[2]	State Acceptance	●	●	●	◐	●	●	◐
	Community Acceptance	●	●	●	●	●	●	●

Notes: [1] Costs for the preferred alternatives are provided in Tables 2-5 and 2-6. Costs provided here include Remedial Alternative Costs plus review costs ($42,000 per review) to provide a meaningful comparison.

[2] The modifying criteria will be evaluated after the Proposed Plan following review and input from these parties.

● Favorable (Pass for threshold criteria)

◐ Moderately Favorable

● Not Favorable (Fail for threshold criteria)

2.11 Principal MEC Issues

Principal MEC issues are materials that present significant potential explosive hazard to human health or the environment should exposure occur. Because MEC would present a significant hazard to human health should exposure occur, it is considered to be a principal MEC hazard. All of the alternatives, except Alternative 1, would address the principal MEC hazard. Alternative 2 would address the hazard by reducing the potential for exposure through increased public awareness rather than treatment. Land MRS Alternative 3 would address the hazard by reducing the exposure through treatment (i.e., removal and disposal) in areas most accessed by the public,and by reducing the potential for exposure through increased public awareness in heavily vegetated areas. Land Alternative 4 and Inland Water MRS Alternative 3 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 Land MRS Alternative 4 and Inland Water MRS Alternative 3 – Subsurface Clearance as the remedy for the Former Cape Poge Little Neck Bomb Target Site. The selected remedy includes subsurface detection, removal, and disposal of munitions located within the MRSs (234 acres); and public education and notification. Land MRS Alternative 4 and Inland Water Alternative 3 meet the RAO of minimizing or eliminating the explosive hazard to the public, and TTOR workers and contractors.

2.12.1 Summary of the Rationale for the Selected Remedy

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 Land and Inland Water MRSs, 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 options for both MRSs (Land MRS Alternative 4 and Inland Water MRS Alternative 3) are the preferred alternatives. Based on information currently available, the two Preferred Alternatives for the two respective MRSs meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The USACE expects the Preferred Alternatives 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. Land MRS Alternative 4 and Inland Water MRS Alternative 3 can be readily implemented to achieve the RAOs and provide the highest level of overall effectiveness relative to the current and future use of the MRSs. USACE expects the preferred alternatives to meet regulatory requirements and to satisfy the statutory requirements under CERCLA §121(b).

Land MRS

Alternative 4 includes clearing the entire 62 acre MRS of subsurface MEC to 3 feet below ground surface. The following general tasks would be included in Alternative 4.

- Mobilization
- Site management
- Survey and positioning
- Environmental coordination
- Brush clearing (where needed)
- Digital geophysical mapping and data analysis
- Anomaly reacquisition and resolution
- MEC removal
- MPPEH disposal (e.g., BIP)
- MDAS waste stream treatment (off-site) disposal
- Site restoration
- Demobilization
- Post construction vegetation monitoring
- Development and reproduction of training materials; and
- Annual sign maintenance

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.

Approximately 50% of the area (31 acres) included in the MRS is heavily vegetated and will require extensive vegetation removal to gain access during the clearance and to support equipment and staging areas. The vegetation removed would be taken offsite. Erosion control will be implemented until the site is adequately revegetated. Specialized electromagnetic geophysical equipment such as EM61-MK2, EM61-MK2(HP), or TEM-8 that employ TDEMI technology able to detect MEC at the depth found at the MRSs will be used to digitally map the site and data analysis will be performed. Positioning for the digital instrumentation would be conducted using a GPS, Robotic Total Station (RTS) or similar precise positioning system.

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. Intrusive activities are anticipated to occur within the top three feet of soil. However, if anomalies are detected below three feet, they will be excavated until they are confirmed/removed. Any MPPEH recovered during the clearance would be BIP or consolidated for disposal. The MDAS would be placed in locked storage containers during removal, certified as explosive-free MDAS, and disposed off-site for recycling.

Site restoration would be necessary in areas where vegetation was cleared. Native grasses would be seeded in the 31 cleared acres and will require coordination with TTOR. Post-construction monitoring of revegetated areas will be conducted for completion of this alternative.

Since sensitive species are known to exist within the MRS, this alternative will require coordination with MA NHESP, TTOR, and USFWS, and a rare plant and wildlife habitat evaluation will be conducted during development of the work plan in accordance with MA NHESP guidelines. The field work would be scheduled to avoid sensitive species as much as possible. Work will also be coordinated with the Massachusetts Historical Commission and appropriate historic preservation offices.

Based on the RI findings, there is a low probability for encountering MEC other than AN-MK23 20 or AN-MK5 practice bombs with spotting charges. However, out of an abundance of caution, interim LUCs will be implemented during the remedial activity. These would be informational materials will be developed and distributed to property owners, awareness training materials will be developed, and signs will be installed and maintained to ensure the safety of land owners, workers, and the public. 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.

Inland Water MRS

Alternative 3 includes clearing the entire Inland Water MRS of MEC to approximately 3 feet below the inland water floor. The following general tasks would be included in Alternative 3:

- Mobilization
- Site management
- Survey and positioning
- Environmental coordination
- Digital geophysical mapping and data analysis
- Anomaly reacquisition and resolution

- MEC removal
- MPPEH disposal (e.g., BIP)
- MDAS waste stream treatment (off-site) disposal
- Site restoration
- Demobilization
- Development and reproduction of training materials; and
- Annual sign maintenance.

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.

DGM would be utilized on the entire MRS using boat-towed specialized electromagnetic geophysical equipment. Positioning for the digital instrumentation would be conducted using a Robotic Total Station (RTS), ultrasonic or similar positioning system and 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 identified during DGM activities would be reacquired using a GPS, Robotic Total Station (RTS), ultrasonic, or similar positioning system and anomaly resolution (or intrusive activities) would be performed using a combination of hand-tools, as successfully accomplished during the RI, and mechanical methods. Intrusive activities are anticipated to occur within the top three feet of sediment. However, if anomalies are detected below three feet, they will be excavated until they are confirmed/removed. Mechanical methods (such as a marsh buggy or similar amphibious excavator with floatation tracks) would be used for digging deeper anomalies which could require excessive time to dig by hand underwater.

Any MPPEH recovered during the clearance would be BIP or placed in locked storage containers for disposal. The MDAS would be consolidated during removal, certified as explosive-free MDAS, and disposed of off-site for recycling.

Since eelgrass is known to exist within the Inland Water MRS this alternative will require coordination with MADEP and MA Division of Marine Resources; Rare species habitat with MA NHESP and USFWS (Federally listed species). Cultural resources coordination will also be required. Field work would be scheduled to minimize adverse effects to this sensitive resource.

Based on the RI findings, there is a low probability for encountering MEC other than AN-MK23 20 or AN-MK5 practice bombs with spotting charges. However, out of an abundance of caution, interim LUCs will be implemented during the remedial activity. These would be informational materials will be developed and distributed to property owners, awareness training materials will be developed, and signs will be installed and maintained to ensure the safety of land owners, workers, and the public. After all clearance operations are complete, a final safety 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.

Remaining Lands MRS

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

2.12.3 Cost Estimate for the Selected Remedy

The total cost to perform Alternative 4 at the Land MRS is $3,075,000. The total cost to perform Alternative 3 at the Inland Water MRS is $5,038,000.

Detailed cost estimates for Land MRS Alternative 4 and Inland Water MRS Alternative 3 respectively were developed as part of the FS and have been adopted for this DD and provided as Tables 2-5 and 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 Administrative Record 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 Land and Inland Water MRSs, 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 MRSs. 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.

Table 2-5 Cost Summary Land MRS Alternative 4

Land MRS
Alternative 4
Subsurface Clearance
62 Acres

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	$98,286	N/A	$98,286
0110	Explosive Safety Submission	1.00	LS	N/A	N/A	N/A	$23,481	N/A	$23,481
0200	Mobilization - Per Person	24.00	Person	N/A	N/A	N/A	$2,633	N/A	$63,192
0300	Site Management	13.00	Week	1.00	1	13.00	$50,974	N/A	$662,660
0310	Survey/Positioning	62.00	AC	10.00	1	1.24	$15,178	$304	$18,820
0320	Brush Clearing	62.00	AC	5.00	1	2.48	$71,625	$2,865	$177,630
0330	Environmental Monitoring and Coordination (Habitat Survey)	62.00	AC	N/A	N/A	N/A	$86,058	$1,388	$86,058
0400	MEC Surface Removal	0.00	AC	3.00	2	0.00	$41,240	#DIV/0!	$0
0410	MEC Sub-surface Removal, Analog	0.00	AC	2.00	1	0.00	$42,821	$0	$0
0420	Digital Geophysical Mapping	62.00	AC	3.00	1	4.13	$20,910	$1,394	$86,429
0430	Digital Data Analysis	62.00	AC	3.00	1	4.13	$9,852	$657	$40,722
0440	Anomaly Reacquisition	62.00	AC	2.00	2	3.10	$15,178	$1,518	$94,101
0450	Anomaly Resolution	62.00	AC	2.00	2	3.10	$42,821	$4,282	$265,491
0500	Underwater Surface MEC Removal (Analog)	0.00	AC	1.00	2	0.00	$42,821	$0	$0
0510	Underwater Subsurface MEC Removal (Analog)	0.00	AC	1.5	2	0.00	$96,273	$0	$0
0520	DGM - Underwater	0.00	AC	4.0	1	0.00	$36,411	$0	$0
0540	Anomaly Resolution - Underwater	0.00	AC	1.5	2	0.00	$96,273	$0	$0
0600	MDAS Certification and Disposal	1.00	LS	0.2	1	1.00	$19,121	N/A	$19,121
0610	Site Restoration	1.00	LS	0.1	1	2.00	$56,658	$914	$113,316
0620	Demobilization	24.00	Person	N/A	N/A	N/A	$2,633	N/A	$63,192
0700	Remedial Action Completion Report	1.00	LS	N/A	N/A	N/A	$80,199	N/A	$80,199
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	$110,978	N/A	$110,978
0810	Annual Post-Construction Revegetation Monitoring	3.00	Year	N/A	N/A	N/A	$27,318	N/A	$81,954
	Sub-Total								$2,122,369
	Contingency	15%							$318,355
	Sub-Total								$2,440,724
	Infrastructure Improvements	2%							$48,814
	Project Management	5%							$122,036
	Remedial Design (USACE)	8%							$195,258
	Construction Management (USACE)	6%							$146,443
	Total Cost								**$2,953,277**

LONG-TERM MANAGEMENT COST:

	Description	Year	QTY	Unit	Unit Cost	Total
900	Long-Term Management	1-5	5	EA	$13,882	$69,410
	Sub-Total					$69,410
	Contingency	15%				$10,412
	Project Management	5%				$3,471
	Total Long-Term Management Cost					**$79,822**

ALTERNATIVE 4: TOTAL CAPITAL AND LONG-TERM MANAGEMENT COST: **$3,033,098**

PERIODIC COST:

	Description	Year	QTY	Unit	Unit Cost	Total
0820	Five Year Review (cost per review)	5	1	EA	$41,739	$41,739

ALTERNATIVE 4: TOTAL REMEDIAL ALTERNATIVE COST PLUS REVIEW COST **$3,075,000**

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

Table 2-6 Cost Summary Inland Water MRS Alternative 3

Inland Water MRS
Alternative 3
Subsurface Clearance
172 Acres

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	$98,286	N/A	$98,286
0110	Explosive Safety Submission	1.00	LS	N/A	N/A	N/A	$23,481	N/A	$23,481
0200	Mobilization - Per Person	24.00	Person	N/A	N/A	N/A	$2,633	N/A	$63,192
0300	Site Management	17.00	Week	1.00	1	17.00	$50,974	N/A	$866,556
0310	Survey/Positioning	172.00	AC	10.00	1	3.44	$15,178	$0	$52,211
0320	Brush Clearing	0.00	AC	5.00	1	0.00	$71,625	$0	$0
0330	Environmental Monitoring and Coordination	0.00	AC	15.00	1	0.00	$12,462	$0	$0
0400	MEC Surface Removal	0.00	AC	3.00	2	0.00	$41,240	$0	$0
0410	MEC Sub-surface Removal, Analogue	0.00	AC	2.00	1	0.00	$42,821	$0	$0
0420	Digital Geophysical Mapping	0.00	AC	3.00	1	0.00	$20,910	$0	$0
0430	Digital Data Analysis	172.00	AC	2.50	1	13.76	$9,852	$788	$135,566
0440	Anomaly Reacquisition	0.00	AC	2.00	2	0.00	$15,178	$0	$0
0450	Anomaly Resolution	0.00	AC	2.00	2	0.00	$42,821	$0	$0
0500	Underwater Surface MEC Removal (Analog)	0.00	AC	0.75	2	0.00	$42,821	$0	$0
0510	Underwater Subsurface MEC Removal (Analog)	0.00	AC	1.50	2	0.00	$96,273	$0	$0
0520	DGM - Underwater	172.00	AC	4.00	1	8.60	$36,411	$2,913	$313,133
0540	Anomaly Resolution - Underwater	172.00	AC	2.00	2	8.60	$96,273	$9,627	$1,655,901
0600	MDAS Certification and Disposal	1.00	LS	0.20	1	1.00	$19,121	N/A	$19,121
0610	Site Restoration	1.00	LS	0.10	1	2.00	$14,165	N/A	$14,165
0620	Demobilzation	24.00	Person	N/A	N/A	N/A	$2,633	N/A	$63,192
0700	Remedial Action Completion Report	1.00	LS	N/A	N/A	N/A	$80,199	N/A	$80,199
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	$110,978	N/A	$110,978
0810	Annual Post-Construction Revegetation Monitorin	0.00	Year	N/A	N/A	N/A	$27,318	N/A	$0
	Sub-Total								$3,532,719
	Contingency	15%							$529,908
	Sub-Total								$4,062,626
	Infrastructure Improvements	2%							$81,253
	Project Management	5%							$203,131
	Remedial Design (USACE)	8%							$325,010
	Construction Management (USACE)	6%							$243,758
	Total Cost								**$4,915,778**

LONG-TERM MANAGEMENT COST:

	Description	Year	QTY	Unit	Unit Cost	Total
900	Long-term Management	1-5	5	EA	$13,882	$69,410
	Sub-Total					$69,410
	Contingency	15%				$10,412
	Project Management	5%				$3,471
	Total Long-Term Management Cost					**$79,822**

ALTERNATIVE 4: TOTAL CAPITAL AND LONG-TERM MANAGEMENT COST: **$4,995,599**

PERIODIC COST:

	Description	Year	QTY	Unit	Unit Cost	Total
0820	Five Year Review (cost per review)	5	1	EA	$41,739	**$41,739**

ALTERNATIVE 3: TOTAL REMEDIAL ALTERNATIVE COST PLUS REVIEW COST **$5,038,000**

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

2.13.1 Protection of Human Health and the Environment

The Selected Remedies, Land MRS Alternative 4 and Inland Water MRS Alternative 3, will protect public health and welfare through mitigation of hazards to public health and welfare from exposure to potential residual MEC.

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

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

2.13.3 Cost Effectiveness

The Selected Remedies are 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 Remedies, Land MRS Alternative 4 and Inland Water MRS Alternative 3, are the most cost-effective alternatives that are ARAR-compliant and that provide 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 Remedies represents the maximum extent to which a permanent solution can be implemented in a practicable manner in the Former Cape Poge Little Neck Bomb Target Site. 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 Remedies provide 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

Because this remedy results in UU/UE, Five Year Reviews are not 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 Proposed Plan was released for public comment to the final selection of the remedy. The Proposed Plan for the Land and Inland Water MRSs was advertised for public availability in November 2014. The Proposed Plan identified Subsurface Clearance as the response action for the Land MRS Alternative 4 and the Inland Water MRS Alternative 3. Written comments were received during the public comment period from the public and stakeholders and are summarized in Section 3, The Responsiveness Summary.

3. RESPONSIVENESS SUMMARY

The 30-day public comment period for the Proposed Plan was held from 17 November 2014 to 19 December 2014. Instructions were given on how to obtain and review information pertaining to this Site as well as how to submit formal comments. The public was also given an opportunity to attend and provide comments on the Proposed Plan at Public Comment Meeting held on 3 December 2014, 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 Proposed Plan and lead agency responses to those comments. Additional details can be found in the transcript for the public meeting, which is available in the Administrative Record.

Public Comment 1: Please take extra caution not to remove trees when possible, especially older, established trees. I understand that vegetation will be replanted after the project is complete, but the root systems of these established few trees are imperative to holding the coastal bank together against erosion. New trees will establish a new root system, but we have cedars on the property that have already been working on this for 50+ years. New trees would need 50+ years of growth just to match what is currently there now. With rising oceans and stronger storms, our island needs all the protection it can get, so please, try to keep the trees when brush cutting.

Lead Agency Response Public Comment 1: The effects of vegetation removal will be evaluated prior to the remedial action to avoid significant erosion. The determination to remove established trees will be made during coordination with TTOR, USACE, and State biologists and ecologists. Details of vegetation removal will be discussed during Technical Project Planning meetings prior to the remedial action as well as presented in the Remedial Action Work Plan.

Stakeholder Comment 1 (TTOR): TTOR supports Option 4 for Little Neck and Option 3 for the removal of ordinance from Cape Poge Bay. We believe both of these options provide the greatest opportunity to protect public safety which is our primary concern in these areas. We understand that Option 4 for Little Neck will require the removal of most, if not all, vegetation to assist with the discovery and mapping of buried ordinance. We will work closely with USACE ecology program staff to identify critical ecological concerns and to ensure the area is properly re-vegetated with native species upon completion of the removal action. We urge that brush, shrubs and trees which are chipped be removed from the site. Again, we would urge you to work with our ecology staff on this matter. We also insist that every action be taken to remove all MD and MEC items from Little Neck and the surrounding waters if detected even if discovered below three feet from the surface of the ground or sea bottom.

It should also be expected that during this removal action, there will need to be frequent communication with the Corps and we encourage regular updates of progress.

Lead Agency Response 1: Proper revegetation procedures will be developed in close coordination with USACE, TTOR, and State biologists and ecologists. Vegetation monitoring will be conducted after the remedial action to ensure the effectiveness of site revegetation activities. Brush, shrub, and wood chips will be disposed of offsite.

If an item is detected deeper than 3 feet below ground or sea bottom surface, it will be removed.

Stakeholder Comment 2 (TTOR): Under the first three Land MRS alternatives there is no way that TTOR would ever be able to reopen Little Neck for public access. The only hope of being able to open up Little Neck to the public at some point in the future is going to be with a total clearance.

Lead Agency Response 2: Land MRS Alternative 4 will provide the best opportunity for TTOR to make the decision to re-open Little Neck to the public.

Stakeholder Comment 3 (Edgartown Shellfish Department): This area is a prime Bay Scallop Habitat and as such there is a good amount of harvest activity on the bay from October through March annually. If activities for ordinance removal could happen in the months of April through September as they did the last time then there will be no overlap with the Bay Scallop harvest. Also please bear in mind that this is an area of Cape Poge that is covered with extensive Eel Grass beds excavation should be done by hand and undertaken only when it is necessary.

Lead Agency Response 3: The schedule for remedial action within the Inland Water MRS will be coordinated with the Edgartown Shellfish Department and TTOR to minimize disruption to the Bay Scallop Harvest. Excavation within the Eel Grass beds will be done by hand.

Stakeholder Comment 4 (MADEP): One of our key concerns on this project is to make sure they actually can see what's there so they can remove it. Other projects, Fort Devens and Noman's, I have a list of them. They go out and say they do a hundred percent removal, great intentions, but when they get to the Oak tree or, you know, the vines or something, they walk around. And what we end up with is maybe 40 percent investigation. And from that 40 percent, they dig on a portion of it. So we want to make sure, especially in this target area, that we have a really good plan upfront that really addresses that area. So our concern, and what we learn from other sites, is to make sure when they say a hundred percent, it's a hundred percent. And that starts with removing vegetation.

Lead Agency Response 4: The details of vegetation removal will be discussed during Technical Project Planning meetings prior to the remedial action as well as presented in the Remedial Action Work Plan. The determination to remove established trees will be made during coordination with TTOR, USACE, and State biologists and ecologists.

Stakeholder Comment 5 (MADEP): One of our main concerns in our comments is one of the Applicable or Relevant and Appropriate Requirements (ARARs) is to make sure the vegetation is replaced. And that's a Federal law and it's also State law that the Wetlands Protection Act is addressed in this area. So whatever they remove, they re-vegetate. And we're having some difficulties with Army Corps' attorneys on that. I don't know why. They agreed on the GSA site but not agreeing here.

Lead Agency Response 5: Agreement has been reached on ARARs. See Responsiveness Summary Section 3.1.2 ARARs. It is our intent to build into the work plans a plan to address revegetation.

Stakeholder Comment 6 (MADEP): How are you going to write it in the Proposed Plan and Record of Decision or Decision Document that you will restore whatever vegetation is destroyed. Are you going to put that in the Record of Decision? Is that the plan?

Lead Agency Response 6: Site restoration and vegetation monitoring are discussed in both the Proposed Plan and Decision Document.

Stakeholder Comment 7 (MADEP): MADEP would like the remedial alternatives for the Inland Water MRS and the Land MRS be completed together.

Lead Agency Response 7: Completing the Land and Inland Water MRS Alternatives at the same time is preferred by USACE as well as the project team. In the event funding is not available to complete the remedial actions together, areas with the highest probability of the public encountering munitions will be cleared first.

3.1.2 ARARs

3.1.2.1 After the public release of the Proposed Plan, the State of Massachusetts proposed a number of state requirements as additional ARARs to the preferred alternative. Their contention, and USACE agree, that none of the new state requirements proposed as additional ARARs would cause a change in alternatives, preferred alternative or any of the analysis published in the Proposed Plan or in the Feasibility Study. Pursuant to the NCP, all ARARs must be announced in the Proposed Plan to give the public a full understanding of the criteria that is important to the analysis of alternatives and the selection of a remedy, however these requirements do not change that analysis or make any significant changes to what was discussed with the public.

3.1.2.2. The state concurs, that certain requirements can be added at this point as ARARs or other requirements in this action without their addition being so significant that the FS and PP need to be redone. The following requirements are proposed by the State and are more stringent than any equivalent Federal standards and are considered ARAR to the chosen remedial plan:

3.1.2.2.1. 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.

3.1.2.2.1.1. 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.***

3.1.2.2.2. 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 lternatives 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) ...

3.1.2.2.3. 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.

3.1.2.2.4. 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.

3.1.2.2.5. 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.

3.1.2.2.6. 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, ...

3.1.2.2.7. 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.

3.1.2.2.8. 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.

3.1.2.2.9. 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, ...

3.1.2.2.10. 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.

3.1.2.2.11. 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

3.1.2.2.12. 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.

3.1.2.2.13. 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.

3.1.2.2.14. 310 CMR 10.32 (3) Salt Marshes

A proposed project in a salt marsh, on lands within 100 feet of a salt marsh, or in a body of water adjacent to a salt marsh shall not destroy any portion of the salt marsh and shall not have an adverse effect on the productivity of the salt marsh. Alterations in growth, distribution and composition of salt marsh vegetation shall be considered in evaluating adverse effects on productivity. ...

3.1.2.2.15. 310 CMR 10.32 (6) Salt Marshes

Notwithstanding the provisions of 310 CMR 10.32(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.

3.1.2.2.16. 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.

3.1.2.2.17. 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.

3.1.2.2.18. 310 CMR 10.34 (4) and (5) 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.

(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.

3.1.2.2.19. 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.

3.1.2.2.20. 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.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Secretary

Martin Suuberg
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Ms. Carol Ann Charette, P.M.P
U.S. Army Corps of Engineers, New England Division
696 Virginia Road
Concord, MA 01742-2751

March 18, 2015

RE: Draft Final Decision Document
Former Cape Poge Little Neck Bomb Target Munitions Response Sites, Martha's Vineyard
D01MA0595

Dear Ms. Charette:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the *Draft Final Decision Document, Former Cape Poge Little Neck Bomb Target Munitions Response Sites, Formerly Used Defense Site # D01MA0595, Martha's Vineyard, Massachusetts* dated March 2015.

MassDEP concurs with the selected remedies for the Former Cape Poge Little Neck Bomb Target Area which are identified as **Alternative 4** for the Land Munitions Response site (MRS) and **Alternative 3** for the Inland Water MRS. In summary, Land MRS Alternative 4 includes clearing the entire 62 acre MRS of subsurface MEC to 3 feet below the ground surface and site restoration where warranted. Inland Water MRS Alternative 3 includes clearing the entire Inland Water MRS of MEC to approximately 3 feet below the inland water floor and site restoration where warranted.

MassDEP appreciates the opportunity to review the Decision Document. If you have any questions, please feel free to contact me at 617.292.5788.

Sincerely,

Joanne Dearden
Project Manager
Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

ER 200-3-1

Worksheet C-1

Staffing Matrix for Records of Decision/Decision Documents/Action Memoranda[1]

Decision Document Title: Former Cape Poge Little Neck Bomb Target Munitions Response Sites, Martha's Vineyard, Massachusetts						
Organization	**Staff Activity**	**POC Name**	**Office Symbol**	**Phone Number**	**Fax Number**	**Email Address**
Geographic Military District	FUDS Project Mgr.	Carol Ann Charette	CENAE-PP-M	978-318-8605	978-318-8891	Carol.a.charette@usace.army.mil
	Counsel	Joseph McInerny	CENAE-OC	978-318-8247		Joseph.P.Mcinerny@usace.army.mil
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	FUDS Program Mgr.	Heather Sullivan	CENAE-PP-M	978-318-8543	978-318-8891	Heather.L.Sullivan@usace.army.mil
HTRW Design District/ MM Design Center/Centers of Expertise	Technical/ Environmental	Kim Meacham	CEHNC-ED-CS-P	256-895-1667	256-722-2579	Kim.k.meacham@usace.army.mil
	HTRW CX	NA				
	MM CX	John Sikes	CEHNC-EMM	256-895-1334		John.a.sikes@usace.army.mil
	USATCES[2]	Jim Langley		918-420-8767		Langley, Jimmy L CIV USARMY (US) [jimmy.l.langley.civ@mail.mil]
	USACHPPM[3]					N/A
Geographic Military Division	Program Mgr	Ravi Ajodah	CENAD-PD-ID	347-370-4531		Ravi.I.Ajodah@usace.army.mil
HQUSACE	CEMP-DE					
	Counsel					
	PAO					
HQDA	ODEP					
	TJAG					
	Army Public Affairs					
	OTSG					
	ODASA (ESOH)					
	Army Safety Office					

1. To be completed and forwarded with ROD/DD/AM where the present cost of the selected remedy (RA-C and RA-O phases) exceeds $2 million.
2. For MMRP projects with explosives risk, USATCES coordination requirement is satisfied by providing opportunity for review and comment of the draft EE/CA or draft Proposed Plan.

3. For HTRW projects, USACHPPM coordination requirement is satisfied by providing opportunity for approval of human health risk assessments and review of ecological risk assessments developed during the RI/FS. [AR 200-1, 1-18.a.(3)] USACHPPM coordination not required for removal responses.