Appendix H

Erin Victory/TCI

East Bend Pond

Summary of U.S. Navy Environmental Programs on Nomans Land Island

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-99-D-0032
CONTRACT TASK ORDER NO. 0033

ENVIRONMENTAL PROGRAMS SUMMARY REPORT

NOMANS LAND ISLAND
CHILMARK, MASSACHUSETTS
RTN #4-13390

October 9, 2009

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ACRONYMS AND ABBREVIATIONS

AVS	acid volatile sulfide
AWQC	Ambient Water Quality Criteria
AWQS	Ambient Water Quality Standards
BAF	Bioaccumulation Factor
bgs	belowground surface
BRAC	Base Realignment and Closure Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMR	Code of Massachusetts Regulations
COC	contaminants of concern
CRIP	Community Relations and Involvement Plan
CSA	Comprehensive Site Assessment
CSM	Conceptual Site Model
DoD	Department of Defense
DU	depleted uranium
EBS	Environmental Baseline Survey
EBST	Environmental Baseline Survey for Transfer
EOD	Explosives Ordnance Disposal
EPC	exposure point concentration
EPH	extractable petroleum hydrocarbon
FDA	Former Debris Area
FS	Feasibility Study
GIS	Geographic Information System
HMX	cyclotetramethylenetetranitramine
LN	natural log
LOAEL	lowest observable adverse effects level
LSI	Limited Site Investigation
LSP	Licensed Site Professional
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MDAS	materials documented as safe
MEC	Munitions and explosives of concern
mg/Kg	milligrams per kilogram
NARA	National Archives and Records Administration
NAS SOWEY	Naval Air Station South Weymouth
NOAEL	no observable adverse effects level
NOR	Notice of Responsibility
O&M	Operation and maintenance
OHM	oil and/or hazardous material
PCB	polychlorinated biphenyl
PEC	probable effects concentration
PIP	Public Involvement Plan
PP	priority pollutant
ppm	parts per million
PRAP	Proposed Remedial Action Plan

ACRONYMS AND ABBREVIATIONS – Cont'd

RAA	Remedial Action Alternative
RAM	release abatement measure
RAO	Response Action Outcome
RC	reportable concentration
RDX	cyclotrimethylenenitramine
ROD	Record of Decision
SEBS	Supplemental Environmental Baseline Survey
SEM	simultaneously extracted metal
site or island	Nomans Land Island
TNT	trinitrotoluene
TRC	Technical Review Committee
TtEC	Tetra Tech EC, Inc.
UCL	upper concentration limit
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbon
XRF	X-ray fluorescence
µg/kg	micrograms per kilogram
µg/L	micrograms per liter

1.0 INTRODUCTION

Tetra Tech EC, Inc. (TtEC) has prepared this Environmental Programs Summary Report for the Department of the Navy (Navy), under the Naval Facilities Engineering Command Remedial Action Contract N62472-99-0032, to present a concise account of the environmental programs implemented on Nomans Land Island (site or island) since the initiation of the Base Realignment and Closure Act (BRAC) in 1996 and the transfer of ownership of the island from the Navy to the U.S. Fish and Wildlife Service (USFWS) in 1998. This report also presents the programs that have been implemented in addressing remaining munitions and explosives of concern (MEC) on the island from its former use as a military training range.

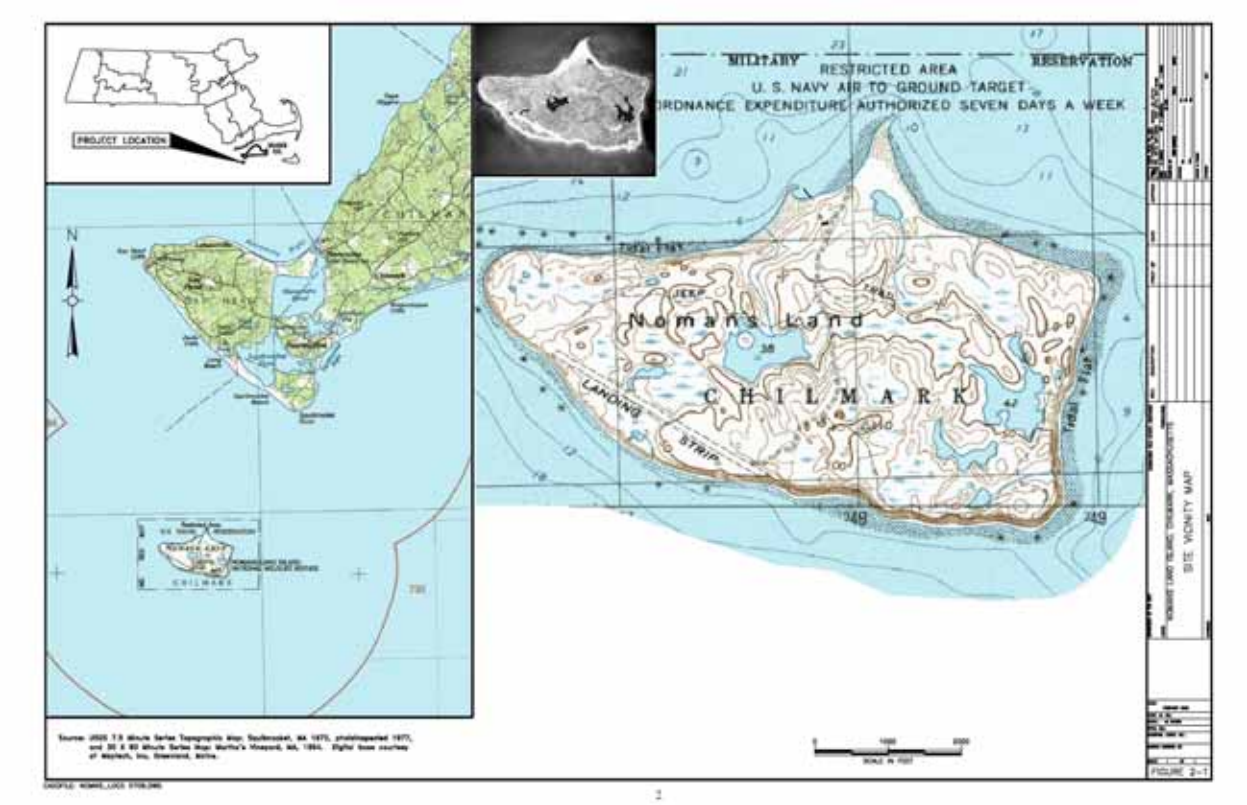
2.0 SITE SETTING AND SITE HISTORY

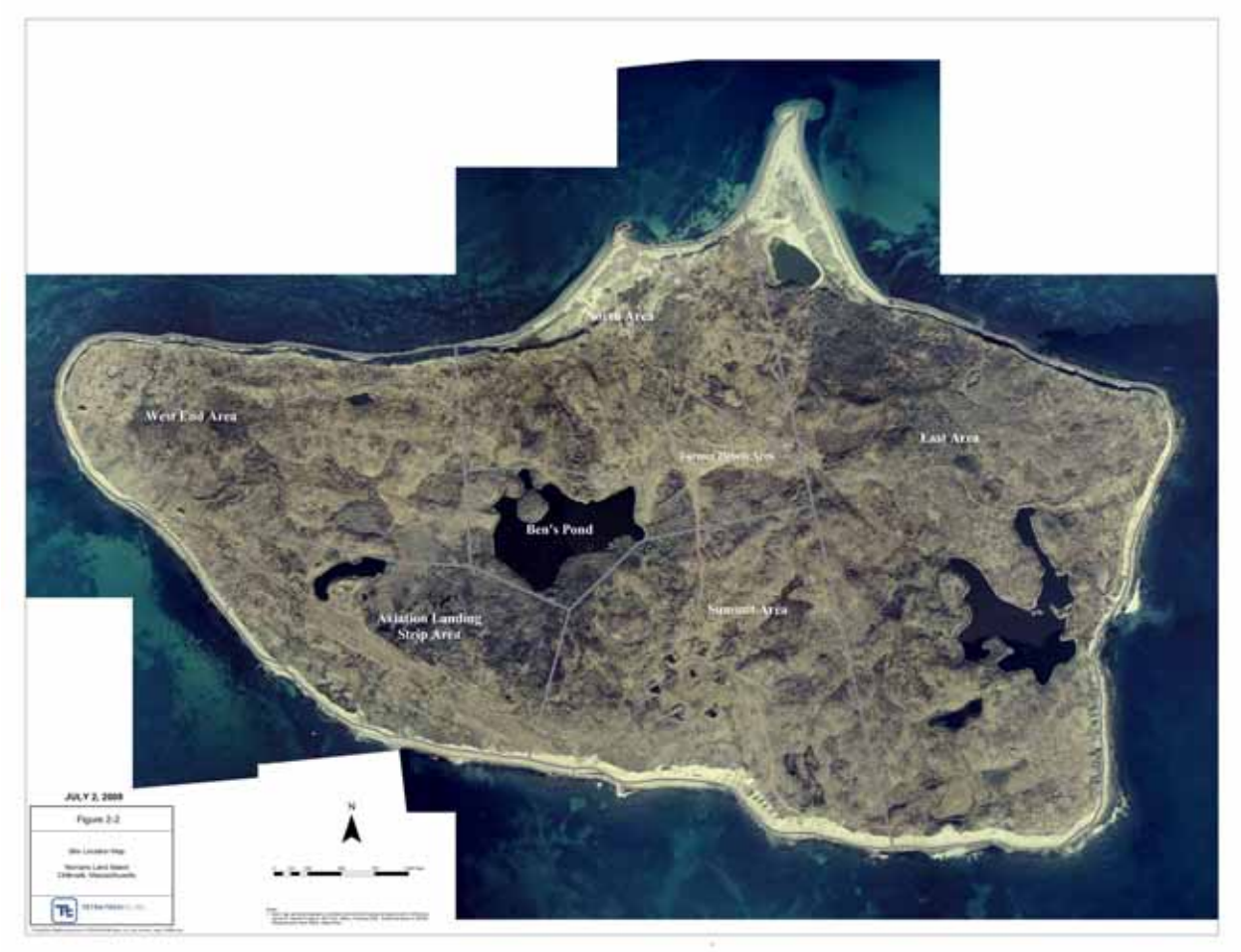
Nomans Land Island is situated off the east coast of the United States, approximately 2.7 miles south of Martha's Vineyard Island in Massachusetts. The 628-acre island is surrounded on three sides by wave-cut bluffs and narrow beaches, and a gently sloping sand and pebble beach on the north. East to west, the island is 1.6 miles long and slightly more than 1.0 mile wide, north to south. Two large freshwater ponds and several smaller ponds dot the island. Ben's Pond lies just west of the center of the island and is approximately 1,000 feet east to west and about 500 feet north to south. Rainbow Pond lies on the east end of the island and is approximately 625 feet east to west. Two arms of the pond extend to the north and northwest. The island is heavily vegetated and dominated by rolling hills.

Nomans Land Island was utilized by the U.S. Government as an air-to-surface target range from 1943 until 1996. Prior to 1943, the island was utilized for various purposes, including fishing and game hunting, and at one time, a small population of people occupied a portion of the island. No civilians have lived on the island since 1943. The water surrounding the island is a Restricted Waterway as marked on nautical maps depicting the island and its vicinity. The airspace above the island remains restricted for military use and is managed by the 104th Fighter Wing.

The Navy and the Department of the Interior entered into a Joint Wildlife Management Agreement for Nomans Land Island in 1970 designating the entire island as a National Wildlife Refuge in recognition of known wildlife nesting habitats. The island was transferred in June 1998 from the Department of Defense (DoD) to the USFWS for the intended use as a wildlife refuge (as part of what is now known as the Eastern Massachusetts National Wildlife Refuge Complex). The USFWS is the current owner and operator of the island. The Navy has retained responsibility for the environmental and MEC remediation aspects of the site.

Figure 2-1 provides the Site Vicinity Map and Figure 2-2 provides the Site Location Map.


PROJECT LOCATION
MILITARY RESERVATION
RESTRICTED AREA
U. S. NAVY AIR TO GROUND TARGET
ORDNANCE EXPENDITURE AUTHORIZED SEVEN DAYS A WEEK
Nomans Land
CHILMARK
LANDING STRIP
JEEP
N
SITE VICINITY MAP


West End Area
East Area
Ben's Pond
Aviation Landing
Strip Area
Summit Area
JULY 2, 2008
Figure 2-2
N

3.0 ROLES AND RESPONSIBILITIES/PUBLIC INVOLVEMENT

Various project stakeholders have been actively involved in the environmental and MEC programs for this site since it was first Tier-Classified in 1999. The site was also designated a Public Involvement Plan (PIP) site. These stakeholders include the USFWS, the Massachusetts Department of Environmental Protection (MassDEP), the general public, and the Technical Review Committee (TRC) established by the Navy to provide review and comment on the various stages of the investigation, assessment, and remediation programs conducted. Project stakeholders have changed throughout the years of conducting the environmental and MEC programs on Nomans Land Island.

Public involvement and community relations have played a very important role in the development and progress of the environmental program being implemented on Nomans Land Island. Since 1997, public involvement activities have been conducted that have resulted in a shared vision of the future use of the island. These activities also provided a means to communicate the investigation, assessment, and remedial approach being conducted. Specific public involvement and community relations initiatives are discussed below as they have been applied to this site.

3.1 Stakeholder Identification and Relations

As part of the TRC (along with the Community Relations Involvement Plan) a comprehensive stakeholder relations program has been and is being implemented. The first TRC meeting was held on March 14, 2001. A stakeholder is defined as anyone with an economic, social, political, or personal interest in an issue. A wide range of stakeholders are involved and interested in the environmental effort. Table 3-1 provides a list of current project stakeholders (and describes their roles and responsibilities), most of which are members of the TRC. These stakeholders are part of the ongoing efforts to keep the public informed by review of reports as well as providing community and stakeholder constituency contacts.

The goal of the TRC is to create a forum that allows the voice of interested individuals to be considered in decision-making. The stakeholder communications agenda identifies the ideas, concerns, values, principles, motivations, and plans of all interest groups involved. The stakeholder relations program currently in place serves to identify incongruities regarding factual information, understandings, and interests. It further seeks to assist the public in understanding the selected technical application being applied by providing the public additional opportunities for input. Numerous one-on-one stakeholder meetings have been conducted both in person and via telephone. In addition, the Navy conducted on-island interviews in winter 2003 as part of the Supplemental Environmental Baseline Survey (SEBS) program, to garner community input, suggestions, and concerns.

3.2 Information Repositories

The following information repositories have been established for Nomans Land Island:

- Aquinnah Township Building
  Aquinnah, MA 02535
  Attn: Carl Widdis
- Chilmark Town Office
  P.O. Box 119
  Chilmark, MA 02535-0119
  Attn: Bea Endriga

- Wampanoag Tribe of Gay Head, Aquinnah Headquarters
  20 Black Brook Road
  Aquinnah, MA 02535-1546
  Attn: Cheryl Andrews-Maltais

These repositories contain copies of all supporting project documentation (both electronic and hardcopy, as applicable) for the site. The repositories provide a location at which the material can be easily viewed by all interested parties.

3.3 Community Relations and Involvement Program

The Nomans Land Island Community Relations and Involvement Plan, dated September 2000 formalizes the process for involving the Martha's Vineyard community, interested members of the public, and the extended community in environmental restoration activities for the site. The CRIP has two purposes:

- To establish channels for communicating information to the public; and
- To provide opportunities for citizens to express their concerns.

The CRIP identifies mechanisms to facilitate communication of technical information and concerns between the Navy and the public to help the community become fully appraised of environmental conditions and related actions. This program reflects the technical progress of the activities and addresses the needs and concerns of the community.

3.4 Technical Review Committee

In 2000, the Navy established the TRC to discuss environmental actions on Nomans Land Island. This TRC is comprised of numerous stakeholders, as identified above, and holds meetings (as necessary) to discuss various phases of the environmental program. Technical work plans, completion reports, and technologies are generally presented to the TRC during the designated public review period, in which the TRC provides comments that are then incorporated into the final reports or actions. TRC meetings are open to the general public and are held in an accessible location that provides convenient access for the Martha's Vineyard community.

3.5 Mailing List

The Navy maintains and regularly updates two mailing lists: a TRC-members list (via e-mail) and a general mailing list. Approximately 22 names are on the TRC-members list. More than 125 names are on the general mailing list, which includes individuals, environmental organizations, businesses, and agencies. Both lists are updated regularly as additional individuals request information and/or involvement.

3.6 Public Notice

The public notices are generally published within the Martha's Vineyard Gazette and Cape Cod Times (as appropriate). Publications may include the following:

- Availability of a draft technical report for review
- Extension of comment period deadlines
- Notice of TRC meeting (open to public) – 14 and 7 days prior notice
- Completion of a release abatement measure (RAM) activity

3.7 Public Comment

Public comments have been solicited through the public notices and/or TRC meetings when each technical report is in draft form and submitted to the TRC and the repositories for review and comment. These plans are presented during the TRC meetings and through teleconference calls, as appropriate.

4.0 SUMMARY OF ENVIRONMENTAL AND MEC PROGRAMS

Based upon three reports for the site, including the BRAC Cleanup Plan (dated September 13, 1996), the Environmental Baseline Survey (EBS) - Phase I Report (dated November 18, 1996) and the Prescribed Burn Prescription (dated January 7, 1997), the island was listed as a site by the MassDEP in a Notice of Responsibility (NOR) letter dated September 26, 1997 and assigned Release Tracking Number 4-13390. The site listing was for the reported release of hazardous materials due to the historical use of the island as an air-to-surface target range by the DoD. Figure 4-1 presents an overview of the environmental (including MEC) programs conducted for the site, in a chronological timeline format. This figure can be used as a guide and follows alongside Section 4.0 of this report.

4.1 Environmental Baseline Survey

4.1.1 Introduction/Purpose

The EBS - Phase I Report for the Naval Air Station South Weymouth (NAS SOWEY) in South Weymouth, Massachusetts (dated November 18, 1996) also included Nomans Land Island. Because the NAS SOWEY is administratively responsible for Nomans Land Island, the EBS - Phase I Report included a section about Nomans Land Island. This work included collecting information from site documents, interviews, aerial photographs, and a site reconnaissance.

Subsequent to the EBS report, the Northern Division Naval Facilities Engineering Command completed the Environmental Baseline Survey for Transfer (EBST) report for the island (March 1998) in support of the Environmental Summary Document for transfer of federal property from one agency to another. The EBST is based upon the EBS - Phase I Report and presents updated information (where applicable) to reflect additional data and actions concerning the current conditions at the site at the time.

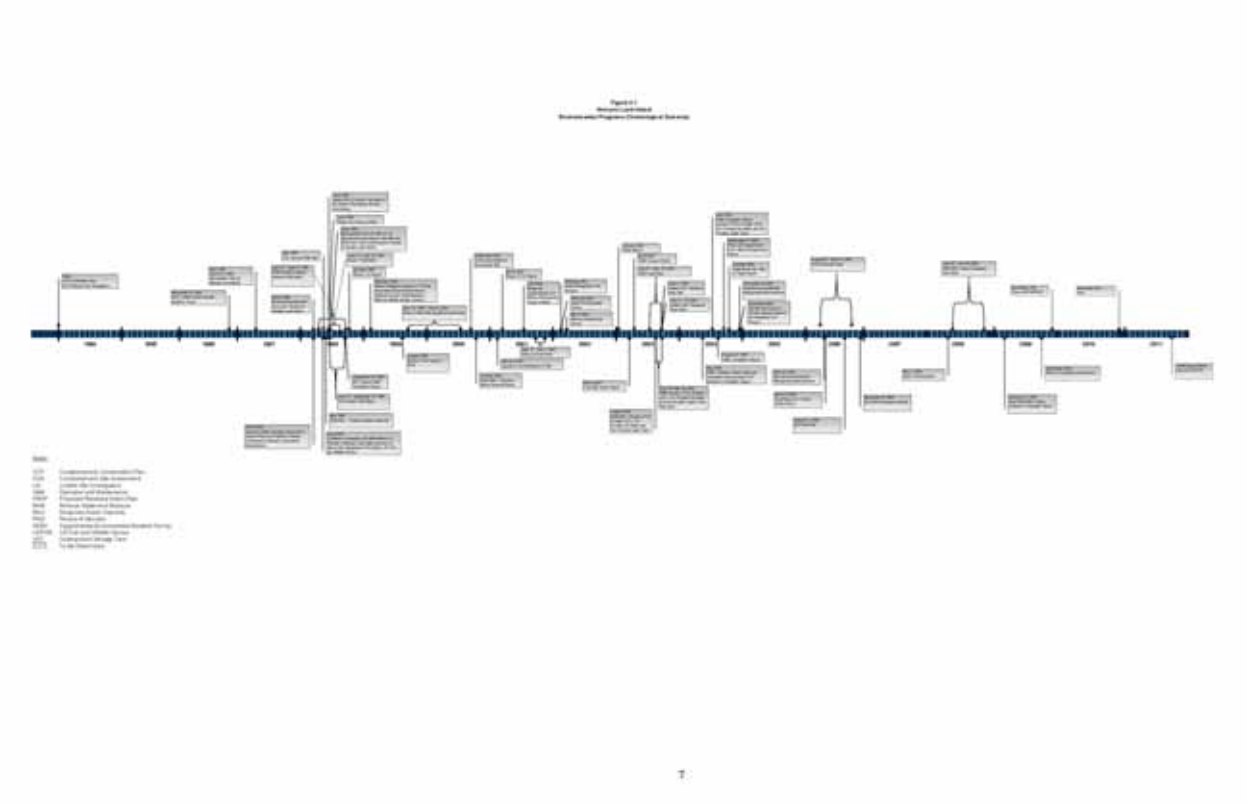
4.1.2 Results/Conclusions

Ten areas, designated as Review Items Nos. 67 through 75 and 81, were identified during the EBS as requiring further investigation. These Review Items are listed in Table 4-1.

4.2 Phase I Limited Site Investigation

4.2.1 Introduction/Purpose

A Phase I Limited Site Investigation (LSI), to initially characterize the nature and extent of contamination, was completed in 1998. This LSI (along with other assessment and remediation activities) addressed the ten Review Items identified in the EBS. A sampling and analysis program was conducted in 1998 to meet the requirements of the Massachusetts Contingency Plan (MCP) in the Code of Massachusetts Regulations (CMR) 310 CMR 40.0483(1)(e). The sampling program was intended to evaluate the potential for releases of oil and/or hazardous material (OHM) on the island. Various site media were sampled as part of the investigatory program, and a combined analytical program was



devised, which included field analytical screening as well as off-site laboratory chemical analyses. The sampling and analytical program was designed to provide data for as much geographical area of the island as was feasible and to focus around areas of ordnance debris and to provide "worst-case" site-specific data for the presence of OHM in various media within the scope of a Phase I investigation.

This sample collection and analytical program was the first comprehensive analytical program at the site and included the following:

- Sampling and analysis of surface soils, pond sediments, pond surface water, and groundwater to determine the presence or absence of OHM.
- Field screening of surface soils for potential contaminants of concern (COCs) (explosives and metals).
- Off-site laboratory analysis of selected samples of all media types to provide definitive data for site chemical characterization.

4.2.2 Results/Conclusions

One hundred and twenty-three (123) surface soil samples were collected for field screening for explosives and metals, of which 52 samples were further analyzed at a laboratory. In addition, seven groundwater samples, seven bottom sediment samples, seven surface water samples, and six potential source media samples were collected and analyzed at a laboratory for various parameters.

Based upon the Phase I data, the site was Tier-Classified using the Numerical Ranking Scoresheet contained within the MCP. The score is based on factors such as contaminant characteristics, site location and features, and potential exposure pathways. In ranking the site, the maximum concentration (conservative approach) of any single chemical parameter was used, as required, regardless of the location on-site. The completed scoresheet for the site was included as part of the Phase I report (FWENC 1998c). Key points from the Numerical Ranking Scoresheet are summarized below.

- Detection of zinc and lead above Ambient Water Quality Criteria (AWQCs) and the presence of a mapped habitat of a Species of Concern, Endangered or Threatened Species (150 points).
- Evidence of soil and groundwater contamination (35 points total).
- Greater than three potential OHM source areas (50 points).
- More than three contaminants with a toxicity score of equal to or greater than 30 (30 points). This includes trinitrotoluene (TNT), which was detected only once out of 52 samples, at a concentration below the Reportable Concentration S-1 (RCS-1) level.
- The presence of a mapped habitat of a Species of Concern, Endangered or Threatened Species, wetlands, fish habitat and protected open space (120 points).

Based on the Numerical Ranking Scoresheet, the site received a score of 508 points, resulting in a Tier IB classification. Therefore, a Tier IB Permit Application was submitted to the MassDEP simultaneously with the Phase I report (FWENC 1998c) and Tier-Classification submittal. The MassDEP issued the Tier IB permit on January 14, 1999 and the Navy returned the Permit Acceptance on February 10, 1999 to the MassDEP. The effective date of the permit is March 10, 1999.

The laboratory analyses of surface soil samples indicated non-detectable levels of explosives in most samples and no exceedances of current MCP RCS-1 criteria. Various levels of metals were detected in the surface soil samples; however, only the parameters lead, zinc, antimony, thallium, chromium, and copper were detected above RCS-1 levels. Sediment samples were non-detect for explosives. The parameters

lead and zinc were detected at concentrations above the RCS-1 levels. However, it is noted that the RCS-1 limits are for soil and not for sediment.

Most of the surface water sample analyses for metals and explosives were non-detect. However, a low level of RDX was detected in one sample. Furthermore, of the seven samples analyzed, four samples contained levels of metals above the U.S. Environmental Protection Agency (USEPA) Chronic AWQC for freshwater. The analyses for explosives in the groundwater samples did not detect any compounds, and approximately half of the metals analyte results for the groundwater samples were non-detects. Most of the metals detected in the groundwater samples were below Reportable Concentration GW-1 (RCGW-1) levels, with the exceptions of zinc, nickel, thallium and cadmium. Of the seven groundwater samples analyzed for volatile organic compounds (VOCs), only toluene was present in any of the samples; however, the detected concentrations were well below the RCGW-1 criteria.

The results of the investigation and assessment of the ten EBS Review Items (designated as Review Items Nos. 67 through 75 and 81) are provided within Table 4-1.

4.3 O & M Plan

4.3.1 Introduction/Purpose

The most recent version of the Unexploded Ordnance (UXO) Safety Operation and Maintenance Plan is dated June 22, 2004 (TtEC 2004b). The plan focuses solely on operation and maintenance (O&M) objectives related to the potential for UXO remaining on the island. The goal of the plan is to protect USFWS personnel, authorized visitors to the island, and to deter unauthorized visitors from going to the island. The plan clearly defines the roles and responsibilities of the USFWS and Navy in relation to the initial site transfer documentation.

4.3.2 Results/Conclusions

Precautions and preventative measures are outlined in the plan and include training, institutional controls, periodic surveillance, and maintenance of signs. Institutional controls include:

- Signage (USFWS Wildlife Refuge, Restricted Area, and UXO Danger Area)
- Nautical and air chart notations
- U.S. Coast Guard/armed forces continued surveillance
- Explosives Ordnance Disposal (EOD) handout
- EOD response

4.4 UST RAM

4.4.1 Introduction/Purpose

Numerous underground storage tanks (USTs) were discovered during the EBS and Phase I that required assessment and removal. The RAM consisted of five excavation areas:

- Tank 1 (approximately 5,000 gallons)
- Tank 1 pipeline
- Tanks 3 (approximately 6,500 gallons) and 4 (approximately 6,500 gallons)
- Tank 5 (approximately 5,000 gallons)
- 4-inch pipeline

4.4.2 Results/Conclusions

The four USTs and associated piping utilized for fuel oil storage, one water tank, and one presumed septic tank were removed or closed-out. Approximately 25 cubic yards of impacted soils were removed. The fuel oil UST closures were completed as part of the MassDEP approved RAM. Post-excavation confirmatory sample results indicated that all associated contaminated soil was remediated. The RAM Completion Report (FWENC 1998b) describes the work performed and results.

4.5 1998 MEC Surface Clearance RAM

4.5.1 Introduction/Purpose

Pursuant to the MCP (310 CMR 40.0446), TtEC completed a RAM on behalf of the Navy. This action was taken to neutralize any potential surface live ordnance by the removal and off-site recycling of inert surface ordnance debris from the site. Because the RAM was conducted prior to Tier-Classification of the site, a RAM Plan, dated May 7, 1998 (FWENC 1998a) was submitted to the MassDEP for approval.

In general, the RAM ordnance debris removal involved the following activities:

- Site preparation (a controlled burn of the island with MassDEP air quality approval was completed on April 28, 1998)
- Surface clearance of ordnance debris (695 grids) and residual target materials
- Neutralizing suspected MEC
- Consolidation of ordnance related material
- Marking of inert ordnance
- Screening for potential depleted uranium (DU)
- Data compilation and reporting
- Off-site transport and recycling of non-ordnance related scrap
- Off-site transport and recycling of ordnance related materials

Limited MEC surface clearances were conducted during the summers of 2003 and 2008 as follow-ups to that performed in 1998. These events are further described below.

4.5.2 Results/Conclusions

Of the 695 grids (each grid approximately 200 feet by 200 feet) swept and cleared, 11,021 items were collected weighing approximately 551,780 pounds (in addition, over 59,000 pounds of non-ordnance scrap were collected and removed). All of the items were practice round type. However, 4,047 items were considered suspect (containing small smoke-charge or residual rocket fuel) and explosively vented between July 24 and August 7, 1998, following the procedure presented in the Remedial Action Work Plan attached to the RAM Plan (FWENC 1998a).

As required by the MassDEP, the ordnance debris recovered from the clearance was surveyed for the potential presence of DU. The work was completed by Inter-Link Group Ltd. and Duke Engineering & Services Environmental Laboratory as presented in a plan dated July 23, 1998 that was submitted to the MassDEP prior to conducting the survey. Two surveys were completed, between July 31 and August 5, 1998 and on August 31, 1998. The surveys concluded that no unusual or elevated levels of gamma radiation above background levels measured on Martha's Vineyard that would be associated with DU were present in the ordnance debris staging area. Based upon these findings, which were presented to the MassDEP after these two surveys, the MassDEP approved the transport of the material off the island verbally on August 11, 1998 (with follow-up letter dated August 12, 1998) after the first survey and

during the week of September 7, 1998 after the second survey. The results of these surveys are contained within the Survey Report for the Radiological Screening Survey on Nomans Land Island, dated September 2, 1998 included within the RAM Completion Report (TtEC 2004a).

4.6 Phase II Comprehensive Site Assessment

4.6.1 Introduction/Purpose

A Phase II field investigation was conducted to further characterize the nature and extent of contamination on the site and involved four quarterly sampling and monitoring events conducted between September 1999 and July 2000. The Phase II also included the performance of the human health, public welfare, safety, and environmental risk characterizations.

In general, the field events consisted of mainly groundwater, surface water, soil, and sediment sampling from previous Phase I locations to confirm or verify the previous results. The soil and sediment sampling focused on those areas identified in the Phase I investigation that exhibited levels of metals and/or explosives above RCS-1 concentrations. Sediment sampling provided additional data in areas where previous sediment samples exhibited detectable levels of contaminants. The goal of the surface water and groundwater sampling and analysis program was to provide additional data concerning previously detected metals, explosives, and VOCs (in one well). To be consistent with the RCS-1 soil screening during the Phase I program, the RCGW-1 criteria were also used to screen the Phase II groundwater data. The Massachusetts Ambient Water Quality Standards (AWQS) were used to screen the Phase II surface water data. The field program included the collection of groundwater, surface water, soil, and various sediment samples within areas described as non-target areas based upon historical use and during the documented removal of surface ordnance debris completed in 1998.

Groundwater and surface water samples were collected during all four events. Soils and sediments were sampled for further assessment and delineation of elevated levels of metals identified in the Phase I. The Phase II field program focused on areas that indicated the greatest potential for contamination. These areas included:

- The Former Target Areas – Aviation Landing Strip Target Area, Summit Target Area, and West End Target Area;
- The Former Debris Area;
- Areas of stressed vegetation/disturbed areas – the Southeast corner of the island, Former Debris Area, and target areas;
- Larger surface water bodies such as Ben's Pond and Rainbow Pond; and
- Non-target and coastline areas.

Groundwater Monitoring

Fifteen groundwater wells, seven from Phase I and eight installed as part of the Phase II investigation, were sampled during the course of the Phase II investigation. Two additional wells were co-located at Phase I and Phase II well locations during Quarter 4 of the Phase II program. These wells were installed in an effort to determine if relatively high zinc levels detected in groundwater samples could be attributed to wells constructed with galvanized risers. The groundwater samples collected from the wells were submitted to an off-site laboratory for PP metals, explosives, hardness, and VOCs analyses, where applicable. Hardness data were also collected during Quarters 3 and 4.

Seven groundwater monitoring wells were installed at the site during the Phase I sampling program. Because concentrations of metals were detected above the screening values (i.e., RCGW-1 levels) in groundwater samples collected during the Phase I, all seven existing wells were again sampled and analyzed for dissolved 13 PP metals (USEPA Method 6010) during Quarter 4 of Phase II. Groundwater samples were also analyzed for explosives (USEPA Method 8330) during Quarter 1 of the Phase II program to provide additional data to confirm previous results. Analytical results again indicated non-detect levels of explosives in all seven wells. Explosives analysis was not performed during the remaining sampling quarters during the Phase II.

Surface Water Monitoring

The Phase II surface water sampling program included quarterly sample collection from the previous seven Phase I locations as well as three additional locations. All samples were analyzed for dissolved PP metals (USEPA Method 6010) and explosives (USEPA Method 8330). Hardness data were also collected during Quarters 3 and 4.

Surface Soil Sampling

A total of 43 surface soil samples (composite and grab) were collected during the Quarter 1 event and analyzed for PP metals, explosives, pesticides, and/or VPH/EPH, as appropriate. Phase II soil sampling locations were chosen from areas where Phase I data indicated elevated levels of contaminants. The Phase II sampling was designed to characterize the vertical and horizontal extent of contamination at previously sampled areas and to confirm the magnitude of the contaminant levels found during the Phase I investigation. Samples were collected at the original Phase I sampling locations (0 to 0.5 feet below ground surface (bgs)) that showed elevated contaminant concentrations to confirm the magnitude of the previously detected levels. In addition, samples were collected at the 1.0 to 1.5 feet bgs interval below that sample to delineate the vertical extent of contamination. Composite samples were also collected around the original Phase I sampling locations that showed elevated contaminant concentrations to delineate the horizontal extent of contamination.

Additional soil samples were collected in an effort to characterize non-target areas on the island. Non-target areas are defined as those areas in the northeastern and eastern coastal portions of the island that were designated as "No Fire Zones" around 1970 based upon the known nesting of a number of wildlife species in these areas. During the Phase I and Phase II field investigations, the field team did not observe any evidence of Navy ordnance expenditure within this part of the island.

Since the Phase II data revealed that levels of contaminants were significantly lower in both the horizontal and vertical directions from the original area of concern, soil sampling did not continue in Quarters 2, 3, and 4 of the Phase II program.

Sediment Sampling

A total of 21 sediment samples were collected and analyzed during the Phase II program. The Former Debris Area (FDA) was first selected for sediment sampling during the Quarter 1 event because levels of lead and zinc were previously detected during Phase I sampling rounds. Three samples were analyzed for PP metals only. Nine sediment samples were also collected on the site in areas that included the FDA, Ben's Pond, and Rainbow Pond, the man-made pond within the vicinity of the Summit Target Area, West End Target Area, Aviation Landing Strip Target Area, and the Southeast Corner of the island. These samples were analyzed for acid volatile sulfide/simultaneously extracted metals (AVS/SEM).

Marine sediment sampling was also performed and included the collection of nine samples along the island's shoreline. The locations were determined by the areas most likely to be accessed by USFWS personnel or potential trespassers in order to access the island, and areas where surface water bodies discharged into the ocean. Five samples were analyzed for both PP metals and AVS/SEM, while the remaining four were analyzed for PP metals only.

4.6.2 Results/Conclusions

The Phase I and subsequent Phase II Quarters 1-4 investigations by TtEC identified the presence of metals in soil, sediments, surface water, and groundwater at the site. In addition, limited detections of EPHs, VOCs, and pesticides were found in select site samples. Although a subset of samples in each phase of sampling was analyzed for explosives, explosives parameters were detected in only three samples during Phase I. No explosives were detected in subsequent Phase II Quarters 1-4 confirmation sampling.

Upon completion of the Phase II Comprehensive Site Assessment (CSA) activities, the site was re-scored, using the Numerical Ranking Scoresheet, as a Tier 1A site. A discussion with MassDEP had indicated that the site is considered part of Cape Cod and the Islands. Therefore, the site was considered as a potentially productive aquifer resulting in a higher score with GW-1 criteria applicable. The MassDEP concurred with the site re-scoring and the Tier 1A designation.

The findings of the Phase II assessment can be divided into four aspects under the MCP Method 3 Risk Characterization: risk to human health, risk to environment, risk to public welfare, and risk to safety. These findings are described in Section 4.7.

4.7 Risk Characterization

Risk to Human Health

The human health risk assessment characterized the potential risks to USFWS workers, adult and child trespassers and authorized visitors. The human health risk assessment was prepared based upon the current and reasonably foreseeable future use of the island as an unstaffed wildlife refuge. Based on the exposure frequencies and duration associated with these receptors and the contaminated media identified, a condition of "No Significant Risk" was established for human health.

Risk to Public Welfare

In accordance with 310 CMR 40.0994, a characterization of risk to public welfare was also conducted. This characterization consisted of two aspects – a comparison of the levels of the COCs detected on the island and an evaluation of nuisance conditions and significant community effects. A comparison of exposure point concentrations (EPCs) developed for soil and groundwater for each COC indicated that the chemical specific upper concentration limits (UCLs) for these media were not exceeded. No specific nuisance or negative impacts associated with the conditions on the island were identified. Therefore, a condition of "No Significant Risk" to public welfare was established for the island based on its current and foreseeable use.

Risk to the Environment

The characterization of the potential risk to ecological receptors on-island and in the near shore environment (off-island) did not reach a finding of "No Significant Risk" during the Phase II program. A supplemental investigation to the Phase II was conducted to further characterize the site and to

determine the risk to the environment. This Phase IIA investigation is discussed in Section 4.8. An Environmental Risk Management Memorandum was drafted to provide a concise document indicating specific locations of concern, impacts, and proposed action. This Environmental Risk Management Memorandum is discussed in Section 4.12.

Risk to Public Safety

An evaluation of the potential risk to safety in consideration of the ordnance that may be present in the subsurface and near shoreline environment did not find a condition of "No Significant Risk" to public safety. A Phase IIB evaluation was then implemented to present an expanded conceptual site model to more completely evaluate the site with respect to explosive safety. A summary of this evaluation and findings is presented in Section 4.14.

4.8 Phase IIA Supplemental CSA – Risk to Environment

4.8.1 Introduction/Purpose

A Phase IIA investigation was conducted in 2001. The purpose of the Phase IIA CSA was to:

- Further characterize the nature and extent of contamination from specific areas that were recommended for further assessment in the Phase II CSA Report (FWENC 2001).
- Incorporate the chemical data obtained from the Supplemental Environmental Baseline Survey (SEBS) into the overall ecological risk assessment for the site.
- Determine whether a significant risk to the environment is present at the site as related to the conclusions discussed within the second revision Phase IIA CSA Supplemental Investigation – Risk to the Environment Report, (TtEC 2004d).

Former Debris Area – Surface Soil and Wetland Sediment Sampling

Samples were collected for surface sediment (0-0.5 feet bgs) at all sample locations and for subsurface sediment (0.5-1 feet bgs) at select locations within the FDA wetlands. Surface soil samples (0-0.5 feet bgs) were collected from all soil sample locations in the FDA and from the subsurface (0.5-1 feet bgs) from select locations.

Nearshore Marine Areas – Sediment Sampling

Marine sediment samples were collected from seven potential nearshore areas (MT-01 to MT-07) identified as potentially receiving on-island contaminant run-off.

Nearshore Marine Areas – *Mytilus edulis* Evaluation

A nearshore biological sampling program was performed to assess if a complete pathway from the on-island sources to nearshore biota exists. This program focused on exposure in the nearshore environment in shallow waters. Shallow waters were defined to be from surface to 10 feet in depth below mean low tide. This effort included the collection and sampling of native *Mytilus edulis* (Blue Mussel) and transplanted mussels (deployment of shellfish cages).

4.8.2 Results/Conclusions

Phase IIA results for the FDA were incorporated into the overall risk assessment. Generally the PP metals concentrations detected were found to be low in the nearshore marine areas and within the range of metals

detected from the beach areas during the Phase II investigation. No explosives related compounds were detected in the nearshore marine sediment samples. The work performed and results are provided in the Phase IIA CSA Supplemental Investigation – Risk to the Environment Report, (TtEC 2004d).

Statistical comparisons between the transplanted blue mussels deployed in shallow sub tidal waters and a cage of transplant mussels deployed for the same period from a background location (near Menemsha Harbor), revealed no significant differences in metals concentrations in tissues. Collection of replicate, indigenous blue mussel samples from the inter-tidal zone around the island revealed concentration of Chromium and Nickel to be slightly elevated when compared to blue mussels collected from Martha's Vineyard and these two metals also exceeded corresponding tissue based NOAEL values. Results of the evaluation indicate that exposure to explosives is not occurring in near-shore marine life. Exposure to most metals appears to be occurring but this exposure was deemed to be insignificant when compared to site-specific and regional reference tissue data and to effects-based NOAEL levels. The only exception appears to be near the West End Target area in which slightly higher exposure may be occurring resulting in exceedance reference tissue concentrations and NOAEL based values for Chromium and Nickel. A potential pathway from the target areas into the near shoreline environment is suggested by the presence of metals in the source area soils, sediments, and biological tissue samples collected in the shallow waters around the island. The presence of scattered ordnance in addition to pipes, lobster cages, pilings and other miscellaneous metal debris present on the beach could also be contributing to the slightly elevated levels of metals in the inter-tidal zone around Nomans Land Island. A finding of potential risk to marine life was determined, based upon exceedances of literature based NOAEL values and a difference in the indigenous mussel data when compared to reference tissue data.

4.9 Supplemental Environmental Baseline Survey

4.9.1 Introduction/Purpose

The SEBS report (TtEC 2004c) detailed the results of the SEBS program (conducted in the summer of 2003), which assessed various information sources as they related to the Conceptual Site Models (CSMs) for the site and the overall site characterization. The following surveys/assessments were performed to gather additional data:

- Aerial Photographic Site Analysis – Research was performed to locate all available aerial photographs for the site. As a result 16 aerial photographs ranging from 1941 to 1999 were located and utilized during the analysis. This analysis is described within the Aerial Photographic Site Analysis Report, dated February 2002.

- Airborne Magnetometry Survey – Between October 21, 2001 and October 28, 2001 an airborne magnetometry survey was conducted for the site with the purpose of mapping underground ferrous items. The Report on Airborne Geophysical Survey Report , dated March 2002, provides the description and results of this effort.

- Historical Research for Military Documentation – The Ordnance and Explosives Engineering Section within the U.S. Army Corps of Engineers (USACE), Rock Island District, was tasked with locating and documenting appropriate classified and unclassified ordnance and chemical historical documentation at the National Archives and Records Administration (NARA), DoD, Library of Congress, and on-line repositories. This research is described within the Historical Research for Military Documentation Report, dated January 4, 2002).

- Historical Design Drawings – Research was performed into base closure archives for the former Naval Air Station South Weymouth to determine if additional historical information could be obtained regarding the construction of the island as a military target range. Many design drawings were discovered and utilized in the SEBS program.
- Public Interviews – Additional public interviews were performed on Martha's Vineyard during three separate sessions on December 11, 12, and 13, 2001. The results of these interviews were incorporated into the SEBS program and are presented within the Interview Summary Letter Report, dated March 15, 2002.
- Geographic Information System (GIS) – To incorporate all of these information sources an extensive GIS was developed. The base layer for this GIS was the photogramatic base map that was flown in 2001. The GIS allowed the data to be presented, analyzed, evaluated, and taken into the field to be appropriately investigated.

4.9.2 Results/Conclusions

A total of 102 prominent features were identified from this program and assessed. Relatively minor features were not considered to be environmentally significant and were not assessed further. Of the 102 prominent features identified, 19 of these features were determined to warrant further field investigation as Review Items addressed during the summer of 2003. The other 83 features were identified/assessed with available information and were determined to not warrant further environmental investigation.

The SEBS report finalized on December 3, 2003 described the 20 Review Items that were investigated, assessed, and/or remediated. Table 4-2 provides a summary of the Review Items (and additional sampling areas requested from the MADEP) and their investigative conclusions/findings that were included in the SEBS Completion Report, dated August 27, 2004 (TtEC 2004c).

The MassDEP also requested that additional soil sampling be performed throughout the site at locations/areas selected by the MassDEP. The results of these analysis were incorporated into the overall chemistry database for the site and incorporated into the site risk assessments. A MassDEP representative was present during the implementation of the SEBS field program and assisted in decision-making associated with Review Item close-out.

4.10 UST/Septic System/Dry Well Closure RAM

4.10.1 Introduction/Purpose

The RAM completed in 2003 consisted of five excavations, to address four Review Items from the SEBS, as follows.

- Review Item N-19 – Former Personnel Building UST
- Review Item N-22 – Possible Former Heater House UST
- Review Item N-14 – Former Garage Building Dry Wells
- Review Item FDA-5 – Former Debris Area Septic Tank Location

4.10.2 Results/Conclusions

Review Item N-19 – Former Personnel Building UST

Review Item N-19 addressed a 275-gallon gasoline storage tank located at the northeast side of the former Personnel Building. The tank (and contaminated soils) were located, excavated, backfilled and the area restored.

Review Item N-22 – Possible Former Heater House UST

Review Item N-22 represented a 550-gallon gasoline storage tank associated with the former Heater House. Since there was no evidence that the Heater House had been built, and the test pit information yielded no evidence of a gasoline storage tank, it was determined that the UST was not present. Both test pits were backfilled with the soil that was excavated, and the areas were seeded.

Review Item N-14 – Former Garage Building Dry Wells

At Review Item N-14, the Former Garage Building, were two dry wells associated with the former structure. The dry wells were located and removed, confirmatory samples were collected, and the site was restored.

Review Item FDA-5 – Former Debris Area Septic Tank Location

In the FDA, a septic system was located that likely serviced the former Quonset huts. The pipe leading from the Quonset hut to the possible septic tank was uncovered and the former septic tank location was found (though the tank had previously been removed), confirmatory samples were collected, and the site was restored.

The findings and conclusions of this RAM were presented in the FDA RAM Completion Report dated, December 19, 2006.

4.11 2003 Limited MEC Surface Clearance

4.11.1 Introduction/Purpose

The 2003 Limited MEC Surface Clearance consisted of a site reconnaissance and MEC assessment, demolition and removal effort. Accessible coastline, roads, and three interior grids were included in this scope with the purpose to evaluate the potential for MEC to migrate to the surface of the site.

4.11.2 Results/Conclusions

Overall, 63 MEC items were observed and removed from along the shoreline. Two MEC items were discovered upland. One was located along a road that appeared to be relocated due to surface runoff and the other was incidental to environmental investigations. These items were properly evaluated, demilitarized, certified, and sent off-site for recycling/disposal. This surface clearance was documented within the Ordnance RAM Completion Report, dated May 14, 2004.

4.12 Environmental Risk Management Memorandum

4.12.1 Introduction/Purpose

At the request of the Navy, USFWS, and the MassDEP, TtEC drafted an Environmental Risk Management Memorandum, which provided a supplemental evaluation of the extent of areas potentially

impacted by the historical use on the site and the potential risk reduction in these areas if hypothetical removal actions were to occur at discrete locations. This supplemental evaluation provided a more realistic estimate of exposure by re-evaluating the no observable adverse effects level (NOAEL) and the lowest observable adverse effects level (LOAEL) for songbirds through utilization of the mean Bioaccumulation Factor (BAF) and the natural log (LN) mean BAF in addition to the 90th percentile BAF. These supplemental evaluations were requested by the USFWS to provide a more accurate and realistic estimation for risk management decision-making.

Numerous project management meetings and conference calls were conducted with the Navy, USFWS, and MassDEP throughout the development of the Environmental Risk Management Memorandum. The final version of the Environmental Risk Management Memorandum, dated April 24, 2006, detailed that utilization of the mean LN BAF resulted in no LOAEL based exceedances for cadmium, chromium, lead, or zinc on an island-wide basis for the songbird. However, the FDA wetland soil/sediment did exceed multiple benthic community endpoints.

4.12.2 Results/Conclusions

Upon discussion of these results with the Navy, USFWS, and MassDEP, it was concluded that a level of "No Significant Risk" to environmental receptors associated with the soil/invertebrate pathway related to the target areas had been achieved. Furthermore, it was concluded that remedial action should be performed at the FDA in order to remove the source material in the FDA slope. This source material was believed to contribute to downgradient soil/sediment (located in the FDA wetland) exceeding multiple benthic community endpoints. The USFWS drafted a letter dated August 5, 2006 in response to the final Environmental Risk Management Memorandum. This letter included four recommendations as follows:

Recommendation 1	A limited removal and restoration of wetland sediment appears to be warranted at the toe of the slope associated with the FDA in the vicinity of sample point MP1-01.
Recommendation 2	Indications that there is buried metallic debris remaining in the slope above the FDA wetland should be evaluated and remedied by appropriate removal and restoration actions.
Recommendation 3	Indications that there may be one or two isolated "hot spots" of elevated zinc concentrations within Area A2 and/or A1 of the Former Aviation Landing Strip Target location should be further evaluated, and limited soil removal and restoration actions be completed as warranted.
Recommendation 4	Soil removal actions to alleviate low predicted risk to insectivorous birds due to soil concentrations of cadmium, chromium, lead, and zinc are not warranted at any target area (with the exception of zinc at one or two isolated areas at the Aviation Landing Strip, as discussed in the preceding paragraph).

Through the Environmental Risk Management Memorandum, project management discussions, and the implementation of the USFWS recommendations listed above, a level of "No Significant Risk" to environment has been achieved for this site. Section 4.14 below discusses the implementation of the USFWS recommendations.

4.13 Former Debris Area RAM

4.13.1 Introduction/Purpose

The objectives of this RAM were two-fold:

- Removal of buried metal debris in the upgradient FDA slope; and
- Removal of soil/sediment sample MP1-01.

These two objectives addressed USFWS recommendations 1 and 2 on the Environmental Risk Management Memorandum, dated April 24, 2006. In addition to the above objectives, the USFWS also requested that further evaluation occur at the Aviation Landing Strip Areas A1 and A2. Therefore, the Navy, USFWS, and MassDEP agreed on a grid surface soil field screening approach for metals (cadmium, lead, chromium, and zinc) analysis at these areas. This approach was built into the RAM/Work Plan and addressed USFWS recommendations 3 and 4.

4.13.2 Results/Conclusions

Field activities were conducted from August 28, 2006 to September 26, 2006, resulting in the excavation and mechanical screening of approximately 900 cubic yards of soil from the FDA slope. Twenty-eight hundred (2,800) pounds of scrap metal/debris was removed and recycled off-site. The MP1-01 sample location was excavated (approximately 2 feet by 2 feet by 2 feet) and approximately one cubic yard of sediment was removed and disposed of offsite. X-ray fluorescence (XRF) field screening was performed on three areas (Areas A1, A2, and A3) at the Aviation Landing Strip. A total of 43 samples were analyzed in the field and six were sent off-site for laboratory analytical comparisons. Field screening and off-site chemistry results indicted levels of metals in the surface soils were much lower than previous biased sampling had indicated. The FDA RAM Completion Report, dated December 19, 2006 (TtEC 2004e) presents the results of the implementation of the FDA RAM.

4.14 Phase IIB CSA – Risk to Safety

4.14.1 Introduction/Purpose

The Phase IIB report, dated April 25, 2006 addresses ordnance safety at Nomans Land Island, in accordance with the DoD and USEPA Unexploded Ordnance Management Principles for Closed, Transferring, and Transferred Ranges dated 7 March 2000 (USEPA 2000). These principles include authority granted to DoD relative to ordnance safety and CERCLA. This analysis also follows MCP regulations. The Phase IIB analysis was performed to further evaluate the risk to safety posed by ordnance and munitions items at the Nomans Land Island Site. An earlier Phase II analysis following the MCP guidelines (referred to as the "original analysis") concluded that a finding of "No Significant Risk" relative to safety had not been established pending completion of DoD actions to address explosives safety due to the current and future potential for trespassers to the island to be exposed to energetic ordnance and explosive items that may be present.

4.14.2 Results/Conclusions

The Phase IIB CSA was conducted to further explore the original analysis of risk to safety in accordance with the provisions of the MCP. The Phase IIB CSA Report, dated April 25, 2006 identifies a number of possible measures to increase public awareness to ordnance hazards and addresses the issue of trespassing at the Site. These measures have been discussed with stakeholders (consistent with DoD/USEPA Management Principles), during a previous TRC meeting, and are being evaluated within the Phase III/FS (see Section 4.16).

4.15 2008 MEC Surface Clearance

4.15.1 Introduction/Purpose

The 2008 effort was comprehensive and included the nearshore coastline and areas found to have significant concentrations of ordnance during the 1998 clearance.

4.15.2 Results/Conclusions

A total of 394 munitions-related items were encountered (not including scrap recovered from grids), documented, and disposed off-site. A total of 16,119 pounds of materials documented as safe (MDAS) were recycled. The land area under this scope included the western portion of the island (not including the eastern historic no-fly zone). The controlled burn did not sufficiently reduce the vegetation in many areas, creating a physical barrier for field personnel conducting the clearance operations and resulted in areas being inaccessible. This inaccessibility also creates a physical barrier inhibiting access for potential trespassers on the site. The magnetometry data (originating from the airborne magnetometer survey conducted in 2001) demonstrates that that the priority areas were cleared. The priority areas refer to the target areas, paths/roads, beaches, etc. The historical target areas and the magnetometry data confirm that these areas exhibit the highest degrees of subsurface ferrous content. Further description of the work performed and results can be found in the 2008 MEC Surface Clearance Completion Report, dated March 27, 2009.

4.16 Phase III/FS

4.16.1 Introduction/Purpose

As described within Section 9.0 the Phase IIA Comprehensive Site Assessment Supplemental Investigation – Risk to the Environment Report, dated September 10, 2004 (TtEC 2004d), the specific objectives of this Phase III/FS Report are threefold:

- Identify RAAs to address the risk to safety;
- Evaluate RAAs in accordance with MCP and CERCLA requirements; and
- Select an RAA to appropriately address the risk to safety to obtain a Permanent Solution and the RAO proposed, as well as a Record of Decision (ROD) under CERCLA.

As a result of finalizing of the Environmental Risk Management Memorandum and implementation of the FDA RAM, a level of "No Significant Risk" to the environment has been achieved. Therefore, the Phase III/FS report is focused on "risk to safety." MEC remain in subsurface soils and have the potential to migrate to the surface through frost heave and erosion. The objective of this Phase III/FS Report is to reach a remedy for the site. The overall objective is to select alternatives which, when implemented, will reduce receptor exposure to MEC remaining in site soils.

4.16.2 Results/Conclusions

The projected future use of Nomans Land Island remains that of an unstaffed wildlife refuge. This future use plays a direct role in the identification, screening, and detailed evaluation of alternatives included within the Phase III/FS Report. It is known that trespassing does occur on the site, thus producing a risk to safety. This scenario has been evaluated in detail within the environmental, human health, and safety risk assessments performed for this project. The Draft Phase III/FS report dated June 5, 2009 was submitted to the USFWS and MassDEP on June 5, 2009 for their review and comment.

5.0 OPERATION AND MAINTENANCE

Operation and maintenance activities associated with the "risk to safety" at the site continue to be on-going. The activities monitor, assess, remove/remediate, and document the potential for MEC to remain on the site.

5.1 In-place Activities

MEC Awareness Pamphlet, Training, and Education

A MEC awareness pamphlet, dated December 22, 2005 was prepared and submitted to the USFWS for their use in managing the island. This pamphlet presents the following information:

- Line drawings or photographs of common MEC items;
- Safety precautions to be observed when encountering MEC items;
- MEC site marking procedures; and
- Contact information for the Navy EOD unit responsible for the Island.

A master copy of this handout was provided to the Eastern Massachusetts National Wildlife Refuge Complex headquarters for future copying and distribution to official Island visitors. USFWS staff and authorized visitors visit the island periodically and educate trespassers (if encountered) as to the restricted nature of the island and possible enforcement actions that may be applied.

Water and Air Space Restrictions

The Navy, in cooperation with the Federal Aviation Administration, designated the airspace surrounding the island as Restricted Area R-4105. The Navy, in cooperation with the U.S. Coast Guard, designated the waters surrounding the island as Prohibited Area 204.5, and required this designation to appear on National Oceanic and Atmospheric Administration surface charts. The waters and air space around the island are restricted and not to be entered without authorization (with resulting fines and enforcement provisions).

Signage

Two types of signage are currently installed along the upland shoreline of the island at strategic locations. USFWS refuge signs indicate that the island is a Wildlife Refuge and is closed to public access. The second type of signs that are strategically placed throughout the site are Navy ordnance warning signs describing the island as a Danger Zone and off-limits. These signs are inspected and maintained by the USFWS. During the MEC surface clearance conducted in 2008 four signs were replaced.

MEC Response

The Navy has been assigned the responsibility of responding to any reports of MEC discovered, marked, and noted on a map of the island by USFWS Workers or Authorized Visitors. The response will be immediate if the situation is deemed critical to the safety of the on-island personnel or may be delayed until the next time appropriately trained EOD personnel are scheduled to be on the Island. A database documents these sightings for future evaluation.

MEC Removal Actions

Three MEC surface clearances have been conducted on the site. The most comprehensive effort was conducted in 1998 followed by a 2003 MEC clearance along the accessible portions of the site including

the shoreline and upland roads. The recent 2008 MEC surface clearance was focused on those areas from the 1998 effort where elevated levels of MEC were encountered and all other accessible areas.

5.2 Future Activities

Currently, the Phase III/FS report is being reviewed by the USFWS and MassDEP. The finalization of this report will describe the institutional controls to be implemented to address the "risk to safety" on the site.

6.0 CONCLUSION

A level of "no significant risk" has been established on this site in relation to the environment, human health, and public welfare aspects. The "risk to safety" (related to the potential for MEC to migrate to the site surface with the potential to come into contact with site receptors) is being managed by the institutional controls already in-place (as described in Section 5.0). The Phase III/FS Report, focused on addressing "risk to safety" has been submitted to the USFWS and the MassDEP and is currently under review. A Proposed Remedial Action Plan (PRAP) will be developed and a ROD will be prepared to implement the selected remedy (resulting from the Phase III/FS process) to address the "risk to safety" remaining on the island.

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TABLES

Table 3-1
Project Stakeholder Roles and Responsibilities

Stakeholder	Project Role	Project Responsibility
Primary Stakeholders		
United States Navy	Previous site owner and operator	Overall funding and project management of the site environmental and safety program.
United States Fish and Wildlife Service	Current site owner and operator	Overall operation of the site in accordance with the current site use as an unstaffed wildlife refuge.
Massachusetts Department of Environmental Protection	State regulator	Ensure project compliance with state statutes and regulations.
Technical Review Committee (TRC)		
Wampanoag Tribe of Gay Head, Aquinnah	TRC member	Review and comment of project reports.
Massachusetts Division of Marine Fisheries	TRC member	Review and comment of project reports.
Massachusetts Department of Public Health	TRC member	Review and comment of project reports.
Chilmark Conservation Commission	TRC member	Review and comment of project reports.
Chilmark Board of Health	TRC member	Review and comment of project reports.
Chilmark Board of Selectmen	TRC member	Review and comment of project reports.
Aquinnah Board of Health	TRC member	Review and comment of project reports.
Aquinnah Board of Selectmen	TRC member	Review and comment of project reports.

Table 4-1
Environmental Baseline Survey Review Item Summary

Review Item	Description	Conclusion
#67	Areas of stressed and burnt vegetation (observed in 1995)	According to the EBST report, the areas of stressed and burnt vegetation were temporary impacts as a result of target activities.
#68	Rust colored water and bombs in Ben's Pond	Ben's Pond surface water sampling and sediment sampling concludes COCs are present. These results were incorporated into the Phase I, II, and IIA reports.
#69	Solid waste on the shoreline	According to the EBST report, the debris has not been identified to consist of hazardous materials.
#70	Remains of Seabee buildings; possible storage of hazardous materials	No hazardous materials identified. Dry wells investigated in 2003.
#71	Scrap metal northeast of Ben's Pond	Removed during Ordnance Removal RAM in 1998.
#72	Bombs and bomb debris scattered over the entire island	Ordnance Removal RAM implemented in 1998.
#73	Vent pipe near the remains of the SeaBee buildings; possible use and storage of fuel oil	Piping and USTs removed (1998).
#74	An underground pipe that was open to the shoreline near the SeaBee dock; possible use and storage of hazardous materials	Piping and USTs removed (1998).
#75	Minor evidence of live ammunition (not bombs, but auxiliaries) and evidence of live bombing (e.g., craters)	Stated in the EBST report, the Navy will continue to be responsible for addressing the potential for any newly identified surface UXO brought to the Navy's attention, in accordance with the DDESB Board management plan for addressing explosive safety.
#81	Possible use of spent uranium in practice ammunition rounds	DU survey conducted in 1998 on ordnance removed from site indicates that no DU was present.

Table 4-2
SEBS Review Item/Additional Areas Summary

Review Item	Description	Conclusion/Findings
Review Item N-101	Barge/Pier	Investigated and found to not warrant further assessment and/or sampling.
Review Item N-13	Linear Anomaly	Investigated and found to not warrant further assessment and/or sampling.
Review Item N-14	Possible two dry-wells	Investigated per RAM Plan.
Review Item N-19	Possible 275 gallon UST	Investigated, assessed, and removed. Impacted soils remediated as part of RAM Plan.
Review Item N-22	Possible 550 gallon fuel oil tank – Heater House	Investigated and found to not warrant further assessment and/or sampling.
Review Item N-2	Two Areas of Open Storage	Investigated and found to not warrant further assessment and/or sampling.
Review Item W-6	Two Strafing Target	Nineteen surface soil samples were collected at each strafing target (total of 38 samples). Samples were analyzed for PP metals and explosives analyses. Results indicate low to moderate levels of metals including one detection of 332 mg/Kg for lead. No explosives were detected in the samples from the strafing target areas.
Review Item N-104	Storage Pad	Six surface soil samples were collected from around the perimeter of the Storage Pad. These samples were analyzed for PP metals, VOCs, SVOCs, VPH, EPH, and pesticides. Results indicate low levels of polynuclear aromatic hydrocarbons (PAHs) (no detectable petroleum hydrocarbon ranges), low levels of metals, and trace concentrations of volatile organics. No pesticides were detected in the samples collected.
Review Item N-105	Unknown Anomaly with Staining	Three surface soil samples were collected within the perimeter of this area. These samples were analyzed for PP metals, VOCs, SVOCs, VPH, EPH, pesticides, and explosives. Results indicate low levels of PAHs (with some evidence of EPH ranges), low levels of metals, and trace concentrations of volatile organics. No explosive compounds or pesticides were detected in the soil samples collected.
Review Item N-7	One Excavation with Dark Material	Four surface soil samples were collected and analyzed for PP metals, VOCs, SVOCs, VPH, EPH, and pesticides. Results indicate low levels of PAHs (some low level detections of petroleum hydrocarbon ranges (EPH and VPH)), and low levels of metals. No pesticides were detected in the samples collected.
Review Item B-1	Ben's Pond	Nitroglycerin was detected in one sediment sample at 3.6 mg/Kg and 3-nitrotoluene (1.9 mg/Kg) was detected at another sediment location. Concentrations for metals in the sediments were generally low to moderate. Sediment samples were found to have concentrations for arsenic, cadmium, chromium, copper, lead, mercury and zinc that exceeded the freshwater sediment screening benchmarks (MassDEP 2002). Surface water samples were collected from select locations collocated with sediment samples. Surface water samples were collected for explosives, metals and perchlorate analysis. Explosive compounds and perchlorate were not detected in any of the surface water samples collected. Trace to low levels of metals were detected in the surface water samples.
Review Item FDA-101	Fuel Oil Aboveground Storage Tank (AST)	Two surface soil samples were collected and analyzed for VPH and EPH parameters. Results indicate one sample had low concentrations of EPH ranges. No benzene, toluene, ethylbenzene, and xylene (BTEX) or PAHs were detected above the sample reporting limits.
Review Item FDA-102	Drum Storage Area	Four surface soil samples were collected and analyzed for VPH, EPH, VOCs, SVOCs, and pesticides. Results indicate low concentrations of PAHs (with low levels of EPH ranges), low concentration detects for DDT (0.021 mg/Kg), and trace levels of volatile organics.

Table 4-2 - *cont'd*
SEBS Review Item/Additional Areas Summary

Review Item	Description	Conclusion/Findings
Review Item FDA - 5	Possible Septic Tank	Investigated, assessed, and evaluated as part of RAM Plan.
Review Item S-4	Unknown Anomaly with Excavation	Two surface soils were collected and analyzed for VOCs, SVOCs, pesticides, PP metals, and explosives. No petroleum range hydrocarbon, SVOCs, explosive compounds or pesticides were detected in the samples collected.
Review Item S-7	Possible Shipwreck	Investigated and found to not warrant further assessment and/or sampling.
Review Item A-4	Aviation Landing Strip – possible horizontal tank	Investigated and found to not warrant further assessment and/or sampling.
Review Item A-5	Possible trench	Investigated and found to not warrant further assessment and/or sampling.
Review Item A-7	Aviation Landing Strip – possible horizontal tank	Investigated and found to not warrant further assessment and/or sampling.
Review Item A-8	Possible Culvert	Investigated and found to not warrant further assessment and/or sampling.
Rainbow Pond	-	Sediment samples were collected from Rainbow Pond to be used as a background comparison to the historically impacted Ben's Pond. Sediment samples were collected for explosives, metals, perchlorate, AVS/SEM and grain size analysis. No explosive compounds were detected in the sediment samples collected from Rainbow Pond. Metals concentrations were generally low to moderate with results for cadmium, copper, lead, mercury and zinc exceeding freshwater sediment benchmark values. Surface water samples were collected from select locations co-located with sediment samples. Surface water samples were collected for explosives, metals, and perchlorate analysis. Explosive compounds and perchlorate were not detected in any of the surface water samples collected. Trace to low levels of metals were detected in the surface water sample.
Anomaly Area A-A	-	Anomaly was found to be an MK82 – 500-lb practice bomb (with a possible live fuse). Two downgradient groundwater wells were analyzed for PP metals, explosives, and perchlorate. Results indicate no detectable explosive compounds and trace levels of metals. Also, one sediment sample was collected directly alongside the MK82 item. This sediment sample was analyzed for PP metals, explosives, and perchlorate. Results indicate relatively low levels of metals.
Additional Sampling Area A-A	-	Three sediment and surface soil samples were collected. The sediment samples were analyzed for PP metals, explosives, and perchlorate. Results indicate low levels of metals and no detectable concentrations of explosive compounds. The surface soil samples were analyzed for PP metals and explosives. Results indicate no explosives were detected and only low levels of metals were reported.
Anomaly Area A-B	-	Two surface soil samples were collected from a drainage channel directly south of this area. These samples were analyzed for PP metals and explosives. Results indicate no detectable explosive compounds and trace to low concentrations of metals.
Additional Sampling Area A-B	-	Twenty-eight surface soil samples were collected. These samples were analyzed for PP metals and explosives. Results indicate no detections for explosive compounds except for one sample (NL-SS-AB26-0-0.5) with reported concentrations of pentaerythritol tetranitrate (PETN) and picric acid. Metals concentrations are generally low for samples collected in the area.
Anomaly Area A-C		Two surface soil samples were collected from the drainage channel located to the southwest of the Anomaly

Table 4-2 - *cont'd*
SEBS Review Item/Additional Areas Summary

Review Item	Description	Conclusion/Findings
	-	Area. These samples were analyzed for PP metals and explosives. Results indicate trace to low concentrations for metals and one low level detect of tetryl at one location (NL-SS-01-0-0.5).
Anomaly Area S-A/Additional Sampling Area S-A	-	Twenty surface soil samples were collected. These samples were analyzed for PP metals and explosives. Results indicate no detectable level of explosive compounds and trace to low concentrations of metals in the soil.
Anomaly Area E-A	-	One downgradient groundwater well was sampled for PP metals, explosives, and perchlorate. Results indicate no detectable explosives and trace to low concentrations of metals