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October 29, 2003

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Naval Facilities Engineering Command (NAVFAC ENGCOR)  
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Attention: Mr. Rod Warner

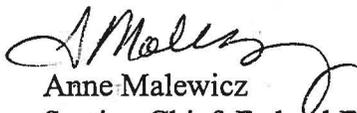
RE: Nomans Land Island Disposal Site – CHILMARK, MA  
RTNs 4-13390 and 3-2621  
Comments on the Phase IIB Comprehensive Site Assessment Supplemental  
Investigation – Risk to Safety

Dear Mr. Warner:

The Department of Environmental Protection (DEP) is in receipt of the Phase IIB Comprehensive Site Assessment Supplemental Investigation – Risk to Safety (Phase IIB), dated July 2003. DEP has reviewed the Phase IIB and provides comments in the attachment to this correspondence. Please note that these comments are provided without the benefit of reviewing the data obtained from the summer fieldwork on Nomans Land Island. Consequently, upon review of these data, additional comments may be warranted.

DEP appreciates the opportunity to comment on the Phase IIB Report. If you have any questions regarding this letter, please contact me at 617-292-5659 or the Project Manager, Robert Campbell at 617-292-5732.

Sincerely,

  
Anne Malewicz  
Section Chief, Federal Facilities

AM/RC/rc

Attachment

This information is available in alternate format. Call April McCabe, ADA Coordinator at 1-617-556-1171. TDD Service - 1-800-298-2207.

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# **Comments on the Phase IIB Comprehensive Site Assessment Supplemental Investigation – Risk To Safety**

## **1.0 Executive Summary (p. ES-1)**

The Navy has referenced the Massachusetts Contingency Plan (MCP) as a guideline. The Department of Environmental Protection (DEP) provides oversight at hazardous waste sites by authority of Massachusetts General Law (M.G.L.) Chapter 21E. The MCP is the operative document describing the methods by which it executes its responsibility under M.G.L. Chapter 21E. The scope of DEP's authority is defined within the Code of Massachusetts Regulations as 310 CMR 40.0000. The MCP is a promulgated regulation supported by law and should be referred to as a regulation, not a guideline, in all future submittals and correspondence.

## **2.1 The Department of Defense/Background and Events Related to Explosives Safety Management at Nomans Land Island (p. 2-1)**

The Department of Defense (DoD) has policies, requirements, and procedures relating specifically to explosives safety and has supplied references to explosive safety management programs and interagency consultations, such as the Department of Defense Explosive Safety Board standards and the DoD/EPA Unexploded Ordnance Management Principles. Determining the Navy's compliance to the DoD standard as it relates to explosives safety management is difficult, since there appears to be a great deal of flexibility in the interpretation of what constitutes compliance. However, these protocols are exclusive to DoD operations. Since Nomans Land Island is a state site managed under the authority of the MCP, the DoD protocols, while useful and integral in framing response actions, do not of themselves represent Applicable or Appropriate and Relevant Standards (ARARs) to be considered. Notwithstanding DoD's self-imposed standards or other performance criteria cited by the Navy, the Navy's efforts in reducing the risk of exposure to ordnance items, debris, and residues to both human and ecological receptors through the means of comprehensive response actions, long term operation and maintenance, or effective activity and use limitations at this site, will be judged by their substantive compliance to the MCP and by the consistency and effectiveness with which the DoD standards, or other comparable measures, are applied to support MCP response actions.

### **2.1.2. The DoD Ammunition and Explosive Safety Standards (pp. 2-2 through 2-3)**

Of particular interest to DEP is the citation the Navy provides from DoD 6055.9-STD, Chapter 1, Section C.1.2., identified as a DoD policy. In addition to being DoD policy, DoD 6055.9-STD is a Department of Defense Explosive Safety Board (DDESB) Standard and presumed to be a performance standard within this context. Although DEP anticipates that the Navy will expand or has expanded its response actions to address the concerns detailed below, the broad scope of the assertions cited above seem to commit the Navy to significantly more comprehensive response actions than have been conducted to the present time:

1. According to DoD 6055.9-STD, Chapter 1, "...the standards herein shall be considered minimum..." The performance standard achieved to this point for ordnance response has

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included one major surface clearance of ordnance, performed under a DDESB-approved work plan that deviated from the DDESB's minimum default Standard for ordnance clearance consistent with future use as a wildlife refuge. According to the Standard, Chapter 12, Section C12.3.4.5, assessment depth for a site with Limited Public Access (Livestock/Wildlife Preserve) is 1 foot. Except for selected areas of investigation associated with worker safety, in general, this standard was not applied consistently during surface clearance activities to other areas, such as:

- a. Shallow anchorages, particularly on the north side of the island
- b. The beach intertidal zone
- c. Easily accessible upper beaches above the storm berms
- d. Roads and trails leading to the upland interior
- e. Other potential high use areas

These locations should be earmarked for special attention during future ordnance clearance activities and in the drafting long-term operation and maintenance plans for risk reduction of potential exposure to ordnance.

2. Other notable concerns relating to surface ordnance clearance and magnetometry:
  - a. In preparation for the surface ordnance clearance Release Abatement Measure (RAM), the island was subjected to a vegetative burn. The burn was incomplete and the total acreage burned was not reported.
  - b. The surface ordnance clearance was performed under a work plan that was submitted to DDESB. Part of the documentation required by DDESB includes an After Action Report. The Navy has indicated that it has a draft of this report, and in Section 2.2 cites the draft as supporting documentation. DEP has not seen this report and would need to review it as part of its final determination for closure of the associated MCP RAM.
  - c. After conducting the surface clearance, the Navy provided DEP with a site map that showed a rough distribution of ordnance and debris items removed. The grids of the map measured 200 ft. x 200 ft. and identified the total numbers of items removed from each grid. Despite the removal of a significant amount of ordnance and debris, many grids were reported to be void of surface ordnance, showing that no ordnance or debris was recovered from those grids. In the fall of 2001 an aerial magnetometer survey showed many anomalies in these apparently empty grid squares. One explanation for this apparent discrepancy could be that all the ordnance within a particular grid was subsurface; another could be that though surface ordnance was present within a given square, it was undetected in the surface sweep either because the magnetometer operator's traverse was irregular, or the terrain was too difficult to pass; or, there may be other reasons for this apparent discrepancy. In any case, the grid squares that were shown to be free of surface ordnance and debris have also been shown to be replete with large or very large magnetic anomalies, some of which may have emerged since the surface clearance RAM in 1998.
  - d. The aerial magnetometer survey conducted by the Navy in 2001 was instrumental in identifying the distribution of magnetic anomalies across the island. While

some of the very large anomalies were consistent with infrastructure or other identifiable surface features, hundreds of others were identified as large to very large anomalies, most probably subsurface and ordnance-related. No follow-up to the magnetometer survey was performed to identify any of these anomalies by a methodical excavation, as is the standard practice with any type of ordnance-related magnetometry survey.

DoD 6055.9-STD, Chapter 12 addresses “Real Property Contaminated with Ammunition, Explosives or Chemical Agents”. As noted in Section C12.2:

“Every means possible shall be used to protect members of the general public from exposure to hazards from contaminated real property currently or formerly under DoD ownership or control.” and “Permanent contamination of real property by final disposition of ammunition or chemical agents is prohibited” and “Real property that is known to be contaminated with ammunition, explosives or chemical agents must be remediated with the most appropriate technology to ensure protection of the public consistent with the proposed end use.”

The Navy has reduced the exposure to observable ordnance, having conducted some surface clearance activities. The Navy has erected signs as passive deterrents to ward off trespassers. However, the Navy has not yet formalized any plan to develop an Explosive Ordnance Recognition Handout for authorized visitors or the general public. The Navy has not yet established the framework for public education programs about ordnance or submitted a timetable to ensure that surface sweeps of the island for emergent ordnance will be performed on a regularly scheduled basis. Munitions have been observed in areas that are easily accessed by the public, most prominently on beaches where ordnance and explosive material have either washed up from the shallows during storms or eroded from the glacial sediments that form the cliffs above the beach. Other areas where exposures to ordnance and explosive material are possible include shallow anchorages and upland ponds and the shoulders of roads and trails that traverse the island’s inland areas. A long-term operation and maintenance plan must include provisions to address these easily accessible areas with regularly scheduled risk reduction actions. A plan to deal with emergent ordnance should be implemented at the earliest opportunity.

There remains a significant amount of subsurface ordnance and ordnance debris on the island with the potential for emergence. Some of this material has emerged. Trespass on the island and encroachment into the restricted waters surrounding the island are clearly evident. There is no active deterrent to trespass. During the recent field activity, under field conditions that made the upland detection of emergent ordnance difficult, several propellant canisters and other ordnance items were discovered on the upper beach and in the wasting slopes of a beach cliff below a formerly undocumented rocket range. Several of these items were identified as unfired 2.75” rocket motor propellant canisters, intact with initiators. This ordnance material is contact sensitive and if disturbed could ignite, burn at very high temperature, and have the potential to inflict severe burns or worse. Because the corrosive nature of the beach and intertidal zone environment, oxidation/reduction reactions discolor any metallic objects that are exposed to the elements of sea and wind. This natural process provides good camouflage for ordnance items through partial burial and discoloration, and creates a situation favorable to the physical and

chemical destabilizing of energetic components. Even a wary authorized visitor or casual trespasser could easily step on or jolt an ordnance item in this condition. Access to the island is unfettered; boaters would have no trouble coming ashore.

A long-term operation and maintenance program to survey and remove emergent ordnance, to institute effective land use controls to deter trespass, and to promulgate a thorough unexploded ordnance education program may be in the planning stages, but none of these measures has yet been established. Until they are taken, it would appear that the Navy has not yet exercised every means possible to protect the general public.

The Navy has cited several references in the framing of its response actions at Nomans Land Island. Of interest to DEP is whether the Navy has or would also use other references, including the recent advances of the DoD Munitions Site Response Prioritization Protocol – Proposed Rule and whether or not this protocol will eventually affect response actions at Nomans Land Island; the EPA's resource reference, the Handbook on the Management of Ordnance and Explosives at Closed, Transferred or Transferring Ranges; or other resources such as the Army Corps of Engineers Guide for the Characterization of Sites Contaminated with Energetic Materials.

## **2.2 Chronology of Nomans Land Island Activities and Events Relevant to Explosives Safety**

The Navy states that the chronology provides the necessary background and context for any evaluation of explosive hazard for the Island, but the Navy has not provided all of these documents for DEP review or for inclusion into the Administrative Record.

These documents include:

- Explosive Safety Remediation Plan for Nomans Land Island, dated April 1997 (ESRP)
- Notice of Intent to Prepare a Comprehensive Conservation Plan, dated February 24, 1999 (NOIP)
- Final After Action Report, dated March 17, 2003 (AAR)

Please provide these documents for review.

**Note:** The Final After Action Report provided in Appendix E of this submittal presents only the Table of Contents for the report.

## **3.0 MCP Requirements – Characterization of Risk to Safety**

The Navy states, "It has not been established that any aspects of the MCP requirements are applicable to ordnance safety; and MCP requirements have not been applied for any other sites relative to ordnance safety..." This statement is inaccurate. While the MCP may not specifically address ordnance safety, it does address the aspect of safety as related to oil and hazardous material through the requirements found in the MCP's Subpart I: Risk Characterization (310 CMR 40.0900).

Most of the criteria used in oil and hazardous materials risk characterization can be extended to address ordnance and ordnance debris, including unexploded ordnance. For example, Subpart I, 40.0904 Site Information Required for Risk Assessment discusses physical characteristics, the extent of release, and so on. Many, if not all of these requirements, can be applied to ordnance sites to assess issues of ordnance safety and the collateral risk associated with ordnance.

The Navy correctly identifies the large uncertainty associated with estimating risk to ordnance explosive safety and the lack of precedent projects in regarding the characterization of the risk to safety for ordnance contaminated sites. DEP acknowledges DoD's expertise in dealing with ordnance, in its methods for ordnance deployment and handling and in the identification and disposal of discarded munitions and unexploded ordnance. In the quantification of risk to unexploded ordnance that remains at a Closed, Transferred, or Transferring Ranges such as Nomans Land Island, DEP believes that given the considerable uncertainties surrounding former range use, quantities and types of ordnance deployed, dud-fire rates, range clearance practices, the decay rates of unexploded ordnance, and the vagaries of ordnance emergence by natural processes such a risk may not be possible to quantify. However, it is DEP's opinion that the MCP should be applied to the characterization of risk to safety to the extent possible. Where there is sufficient ambiguity in the regulation for dual interpretation, DEP suggests close consultation with the Navy and its Licensed Site Professional to clarify intent and to decide on an appropriate course of action. DEP is hopeful that the resultant discussions will arrive at a consensus in mitigating the uncertainty in risk quantification.

### **5.1 The Current Conceptual Site Model**

DEP is in general agreement with the framework of the Navy's Conceptual Site Model (CSM) for potential exposure to ordnance and explosives described in § 4.0.

### **5.2 Greater Focus on Access and Interaction**

In the discussion to expand the representations for the three types of receptors identified in the CSM, the example is given of the level of interaction of the USFWS Worker who is at risk of exposure. It presumes that the worker has the ability to recognize and avoid UXO through training and motivation, that the ordnance encountered can be observed and therefore avoided, and that there may be trained ordnance personnel within the USFWS group to provide added assurance that the risk of exposure to USFWS personnel is mitigated. The assumptions presuppose that an operation and maintenance plan (OMP) exists to assure that training in UXO avoidance has been conducted. While this concept is valid, the application of the training concept has not been formulated, and the presumption should be that the USFWS personnel have no formal training in UXO avoidance; this could be particularly true in cases where summer interns or citizen volunteers are employed to supplement USFWS personnel in the field.

Assuming that an OMP is produced to address these objections, DEP would concur with the assumptions presented in the example.

In reviewing **Figure 5-3, Access and Interaction of a Trespasser with Site Soils**, DEP notes that the effectiveness of passive deterrents off island or on/near the island would have a doubtful

impact on determined trespassers. The figure indicates that the Frequency/Repetition of Activity is moderately low. This assumption is arguable. If a trespasser has found that access to the island is unencumbered, there would be no reason to inhibit repeated visitation, particularly if something of particular interest was encountered. Also, the figure indicates that the Intrusiveness and Intensity of Activity is only moderately high. This assumption is also arguable in that several plausible scenarios can be posited that would demonstrate very high intrusiveness and intensity of activity. For example, a trespassing fisherman retrieving a lobster trap that has been embedded on the beach might have to expend a significant effort to free his trap. DEP recognizes that just because a scenario is imaginable does not mean it is credible for consideration in the frequency/repetition of action or in the intrusiveness or intensity of activity; but those scenarios that can be posited as reasonably expected should be given greater consideration, and by extension receive a more conservative estimation in the evaluation of access and interaction with site soils.

#### **5.4 How “Exposure” May Become “Hazard”**

On page 5-5, 4<sup>th</sup> paragraph, discussion of natural processes states “These processes may cause a small number of OE items to come to the surface over time.” This is a point of discussion that requires clarification. The dynamic natural processes that expose OE, primarily erosion, frost heaving, and wetland eutrophy can be significant at some locations of the island. The cliffs, beaches and bogs are particularly at risk to these processes. In areas that are former target areas near cliffs, the rate of erosion may be pronounced and has been measured in similar formations on Martha’s Vineyard to be upwards of one foot per year. Tides and storms make beach environments extremely likely locations for emergent ordnance. As boggy wetlands dry up, ordnance can be exposed. Where there is proximity of these areas to former targets, the evidence from aerial magnetometry for the target areas has shown numerous anomalies that are most likely ordnance-related. To say that a small number of OE items come to the surface over time, when no subsurface clearance has been conducted to minimize the likely emergence of subsurface ordnance, may underestimate what is really occurring.

On pages 5-5 through 5-6, in discussing the second condition for an exposure to become a hazard, namely that the item must be energetic, reference is made to the 1998 RAM activity. DEP acknowledges that most of the ordnance retrieved during the surface clearance activity was found to be training ordnance, and as such, contained minimal energetic material. DEP agrees that the remaining ordnance that is contained in subsurface soils or submerged in upland freshwater ponds or the coastal marine habitat could be a mix of training ordnance and/or high explosive (HE) ordnance. However, since the surface clearance in 1998, two field events have occurred, the most recent in Summer 2003. Conditions were not optimal for the detection of emergent ordnance, yet a number of ordnance items were discovered in the course of field activities and, energetic ordnance items were a significant fraction of the total number found. The energetic items that were observed were very accessible. Consequently, a presumption that the ratio of energetic material to total ordnance will be similar to what was found during the surface ordnance clearance RAM may be unfounded and underestimate the risk associated with future ordnance emergence.

The third condition discussed states that "...the energetic ordnance or explosive material must be likely to detonate as a result of the receptor's interaction with the item..." and indicates that more passive activities, such as walking, bird watching, or surveying wildlife impart only relatively little force to the ground. While it is reasonable to assume this is generally true, it doesn't necessarily follow that an ordnance item that is contact sensitive would be any less susceptible to detonation if it were trod upon accidentally by a person hiking the beach, than if it were intentionally disturbed.

## **6.0 Identification and Functional Specification of Candidate Response Action Components**

The Navy proposes a number of potential response action components with which DEP agrees. However, some of the proposals would require coordination with other agencies such as the U.S. Fish and Wildlife Service, the U.S. Coast Guard and possibly state and town authorities for the implementation of a proactive deterrence component. To date, no interagency agreements exist to provide the necessary assurances that this deterrence component would be effective.

## **7.0 Candidate Response Action components to Reduce the Risk to Safety Associated with the Trespasser Scenario**

See comment for § 6.0.

## **8.0 Next Steps Toward Recommending Risk Reduction Alternatives**

At this time, DEP reserves comment on most appropriate Response Action Outcome for this site until all pertinent data are presented; however, it seems unlikely that a Permanent Solution can be achieved within the parameters outlined above. DEP reminds the Navy that no Activity and Use Limitations may be used to justify a conclusion that a condition of No Significant Risk exists or has been achieved.

