

U.S. Army Corps of Engineers, New England District  
Formerly Used Defense Site Program  
**PROPOSED PLAN FOR  
MUNITIONS RESPONSE ACTIONS**



Osborne Pond, Former Camp Edwards, Bourne Massachusetts  
FUDS Project No. D01MA000913

August 2013

**THE U.S. ARMY CORPS OF ENGINEERS  
ANNOUNCES PROPOSED PLAN**

This Proposed Plan identifies the Preferred Alternative to address the potential hazards associated with munitions and explosives of concern (munitions that may pose an explosive hazard, hereafter *MEC*) and munitions constituents (any materials originating from munitions including explosive and non-explosive materials, hereafter *MC*) at Osborne Pond, Former Camp Edwards, Bourne Massachusetts (hereafter *the site*). This Proposed Plan also provides the reason for this preference and describes other cleanup alternatives considered for use at this site. The map below shows the location of the site.

This Proposed Plan is issued by the U.S. Army Corps of Engineers, New England District (hereafter *the Corps*), with regulatory oversight from the Massachusetts Department of Environmental Protection (hereafter *MassDEP*) and the U.S Environmental Protection Agency (hereafter *USEPA*).

**MARK YOUR CALENDAR!**

**PUBLIC MEETING:**

**September 26, 2013 at 6:30 PM**

The Corps will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study Report. Verbal and written comments will also be accepted at the meeting. The meeting will be held at the Jonathan Bourne Library, 19 Sandwich Road, Bourne, Massachusetts 02532.

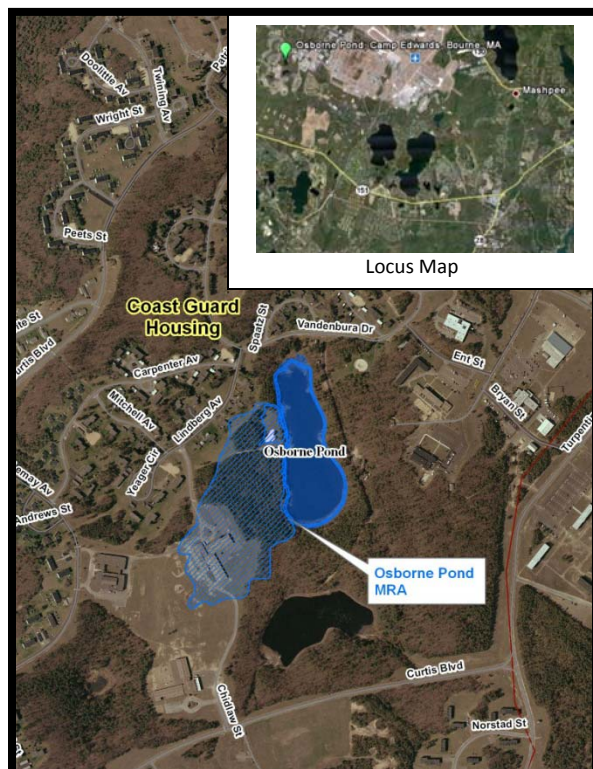
**PUBLIC COMMENT PERIOD:**

**September 6 to October 7, 2013**

The Corps will accept written comments on the Proposed Plan during the public comment period.

**ADMINISTRATIVE RECORD:**

For more information on the site, see the Administrative Record at the site, see the Administrative Record at the Jonathan Bourne Library, 19 Sandwich Road, Bourne, Massachusetts 02532.



This Proposed Plan does not affect response actions at other sites under the jurisdiction of the Corps. The Corps may modify the Preferred Alternative or select another response action based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives and on the

rationale for the Preferred Alternative presented in this Proposed Plan.

The Corps is issuing this Proposed Plan as part of its public participation responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan.

This Proposed Plan highlights key information that can be found in greater detail in the Remedial Investigation (hereafter *RI*) Report, Feasibility Study (hereafter *FS*) Report and other documents contained in the Administrative Record file for this site. The Corps, MassDEP, and USEPA encourage the public to review these documents to gain a better understanding of the site and the investigations that have been conducted.

## SITE BACKGROUND

The site is located within the former Camp Edwards, which was established in 1938 as a training site for the Massachusetts National Guard. In 1940, the U.S. Army leased Camp Edwards to train soldiers for World War II. Tens of thousands of Army soldiers trained at Camp Edwards from 1940 to 1946. After World War II, Camp Edwards was deactivated. The Air Force took control of nearby Otis Field in 1948 and established Otis Air Force Base. The U.S. Army reactivated Camp Edwards from 1950 to 1952 to train troops for the Korean War. Camp Edwards was not reactivated for the Vietnam War, but training continued on Camp Edwards during that time. In 1973, the Massachusetts Army National Guard resumed control of Camp Edwards.

A former bivouac area (i.e., a temporary military encampment made with tents or improvised shelters) was located to the west and southwest of the upland area of Osborne Pond. The site was part of the housing and administrative portions of Camp Edwards. A former Air Force Reservist stationed at MMR from 1963 through 1973 indicated that MEC items may have been disposed in the pond. The witness recalled a picture in a newspaper article in the summer of 1968 or 1969 in which low water levels resulting from a drought exposed mortar rounds, grenades, and artillery shells. Efforts to locate the newspaper article referenced by the witness have been unsuccessful. A 1943 aerial photograph shows a road between a nearby

former ammunition supply point and the pond, suggesting the potential for munitions disposal within the site. However, the Corps has not identified any physical evidence to support the use of this road or the pond for the purpose of munitions disposal.

The Corps conducted their first investigation of the site in August 2003, which involves mapping of the pond using a digital metal detection system. The objective of the mapping effort was to locate metallic items that could be MEC on or buried beneath the pond bottom. The maps generated from this investigation identified several storm drain outfalls and large anomalies that were subsequently investigated during the 2008 RI.

In 2006, the Corps completed the Engineering Evaluation/Cost Analysis (hereafter *EE/CA*) for the site, which included digital mapping of the upland portions of the site. The objectives of this effort were to locate and investigate metallic items that could be MEC within the former bivouac area adjacent to the pond. The Corps investigated 807 metallic signatures detected during the mapping. Of these 807 metallic signatures, the Corps recovered one discarded military munitions (hereafter *DMM*), identified as an unfired 2.36-inch M6 series high-explosive anti-tank rocket. This DMM was located approximately 65 feet from the edge of the pond on the ground surface. The sources of the remaining 806 metallic signatures included nails, soda cans, ball bearings, steel rope, rebar, fence posts, discarded hand tools, fence wire, and various other metallic items unrelated to munitions.

Soil samples were collected near the single DMM item to test for the possible presence of MC. Results of the laboratory analyses did not identify any contaminants at concentrations above the MassDEP Reportable Concentration in Soil for residential areas (RCS-1).

In July 2008, the Corps performed additional site investigation under the RI within Osborne pond itself. This RI effort included investigation of 17 distinct metallic signatures and five storm water outfall areas detected during the 2003 digital mapping of the pond and sampling of the pond water for possible MC contamination. The Corps did not find any munitions-related items during the investigation of these metallic signatures. The analytical laboratory did not detect MC in

any of the pond water samples above naturally occurring background levels. The Remedial Investigation did not find any physical evidence to indicate that the site had been used as a target or disposal area.

### **SITE CHARACTERISTICS**

The site is located adjacent to the U.S. Coast Guard housing area and includes Osborne Pond and the adjoining former bivouac area located to the west and southwest of the pond.

Osborne Pond is a naturally occurring kettle pond, approximately 8.5 acres in size. The adjacent land slopes toward the pond at an average 15 percent slope.

A single groundwater system, known as the Cape Cod Aquifer, underlies all of MMR. The local groundwater gradient is to the southwest toward Buzzards Bay. The source of natural groundwater recharge is rainfall and snowmelt water that averages 43.9 inches per year. Approximately half of the annual precipitation infiltrates the soil and half is lost to evaporation.

This site is considered a recreational area for Coast Guard base residents and the anticipated future land use will remain unchanged.

### **SCOPE AND PURPOSE OF RESPONSE ACTION**

The Preferred Alternative, if selected, will be the final response action for the site as long as no munitions items are discovered that alter the conceptual site model. The response action will reduce direct human contact with potential MEC through a) removal of MEC from the ground surface and near-surface (0-3") of recreational areas and b) public education.

This response action will include the use of removal technologies to permanently reduce the mobility and volume of any potential MEC.

After three investigations at the site, the Corps has not found evidence to support the presence of a target or munitions disposal area that could be considered "source materials constituting principal threats" as defined by EPA Guidelines. The proposed response action will further reduce any potential explosive hazard risk to the public and the environment through public education and physical removal of any materials which may "constitute a principal threat."

### **SUMMARY OF SITE RISKS**

As part of the RI, the Corps conducted a baseline risk assessment to determine the human health and ecological risks associated with potential MEC and MC at the site.

#### **Human Health Risks Associated with MEC**

The MEC risk assessment is focused on the likelihood of exposure to MEC, the severity of the exposure, and the likelihood of detonation. It is important to note that exposure to MEC does not mean that an incident or injury will occur. A person would have to disturb the MEC (e.g., apply heat, friction or shock to the item) to be exposed to actual explosive hazards.

There is a low human health risk associated with potential MEC in the upland portions of the site. The Corps investigated 807 metallic signatures detected during the EE/CA mapping effort and found one DMM (unfired 2.36-inch M6 series high-explosive anti-tank rocket) in upland portions of the site. This DMM finding is considered to be an anomaly and the potential for additional MEC is low. The site is located within the housing and administrative area of the former Camp Edwards and it is unlikely that the Army used this area for munitions training and disposal.

There is no human health risk associated with potential MEC in the pond. The Corps has mapped the pond and investigated 22 detected metallic signatures, but has not found any munitions-related items in the pond.

The current and anticipated future land use at the site is recreational by residents and visitors to the US Coast Guard housing area.

Vehicular traffic to MMR is controlled with a guarded gate and foot traffic is restricted, however, MMR is not completely fenced.

It is the current judgment of the Corps that the Preferred Alternative identified in this Proposed Plan is sufficient to protect public health and the environment from potential exposure to MEC.

#### **Human Health Risks Associated with MC**

There is no human health risk associated with MC at the site. The Corps has not detected MC above naturally occurring background levels in the samples collected at the site.

### Ecological Risks Associated with MC

There is a no ecological risk associated with MC at the site. The Corps has not detected MC above naturally occurring background levels in the samples collected at the site.

### REMEDIAL ACTION OBJECTIVE

The Remedial Action Objective (hereafter RAO) for the site is to protect current and future recreational land users (e.g., hikers, fishermen, etc.) from the potential risks associated with encountering DMM that may be present in the upland portions of the site.

### SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives for the site are presented below. The alternatives are numbered to correspond with the numbers in the FS Report.

**Common Elements:** Five munitions response alternatives were evaluated to identify the most appropriate response alternatives for the site. Many of these alternatives include common elements. These common elements are listed below and are not discussed further under the alternatives summaries.

- All alternatives, except the “No Action” alternative, include Public Education
- All alternatives, except the “No Action” alternative are expected to attain the RAO
- All alternatives include periodic monitoring by the Corps to ensure the effectiveness of the remedy.

**Note:** Local law enforcement and the U.S. Military Explosive Ordnance Disposal unit will respond to any future MEC discovery at the site regardless of the selected remedial alternative.

#### Alternative 1: No Action

The “No Action” alternative involves no active response or controls to locate, remove, dispose of, or limit the exposure to any potential MEC present within the site. In addition, the Corps would assume no responsibility for public awareness or education concerning the potential

explosive hazards within the site. The “No Action” alternative is used in the evaluation of alternatives to provide a baseline for comparison of other response alternatives.

The “No Action” alternative assumes continued use of the site in its present state. If the potential exposure and hazards associated with the site are compatible with current and future developments in the area, then “No Action” may be warranted.

#### Alternative 2: Public Education

The “Public Education” alternative utilizes a Public Education Program to reduce direct contact with MEC potentially present at the site.

The Public Education Program includes installation of warning signs and distribution of MEC safety educational media to base residents and personnel.

The Public Education Program will provide effective risk management by educating the local populace of the potential explosive risks at the site.

Educational media providing MEC safety awareness training and reporting procedures will be distributed to base residents and personnel. The Corps will work with the USCG to ensure that educational material is distributed to the local residents and recreational users. In addition, educational packages will be distributed to local police, fire departments, and libraries, where they will be available to the public. Public safety awareness meetings will be conducted periodically for the general public and land users within the site.

#### Alternative 3: Limited Subsurface Clearance of the Recreational Areas with Public Education

This alternative combines removal and disposal of *Material Potentially Presenting an Explosive Hazard* (MPPEH) from the ground surface and limited subsurface (0-3 inches) of the picnic areas, walking paths, and de-vegetated areas within the former bivouac area where people are likely to linger, and the area around the location of the DMM found at the site (3 acres). Under this alternative, the Corps will:

- Implement the Public Education Program (warning signs, safety meetings, and education materials);
- Survey and subdivide the recreational areas into smaller work sectors;
- Cut a minimal amount of brush and shrubs in the recreational areas of the former bivouac area to allow for safe removal of limited subsurface MEC and munitions debris (MD);
- Screen for DMM and MD using an all metals detector and remove if visible on the ground or limited subsurface. Clearance contractor will also use a handheld shovel or similar equipment to check for near-surface (0-3") items;
- Perform, if necessary, explosive demolition of MEC found at the site; Or
- Transport non-hazardous MD for offsite treatment and disposal.

#### **Alternative 4: Subsurface Clearance of Recreational Areas with Public Education**

Subsurface clearance of MPPEH is used when the risk assessment indicates that the public may be frequently exposed to MPPEH below the ground surface.

As part of this alternative, the Corps will perform metal detector-assisted clearance of all MPPEH from the ground surface and below the ground surface of the picnic areas, walking paths, and de-vegetated areas within the former bivouac area where people are likely to linger, and the area around the location of the DMM found at the site (3 acres). This alternative also includes all the elements of Alternative 2. Under this alternative, the Corps will:

- Implement the Public Education Program
- Cut a minimal amount of brush and shrubs in the recreational areas of the former bivouac area to allow for safe removal of surface MEC and MD
- Survey and subdivide the recreational areas into smaller work sectors
- Remove MEC and MD from the ground surface and buried below the ground surface in the recreational areas

- Perform, if necessary, explosive demolition of MEC found at the site
- Transport non-hazardous MD for offsite treatment and disposal

#### **Alternative 5: Complete Clearance of the Former Bivouac Area with Public Education**

This alternative includes all elements of Alternative 4, but the removal of MPPEH would extend over a greater area. For Alternative 5, surface and subsurface clearance of MEC would be conducted across all undisturbed portions of the former bivouac area (10.5 acres).

This alternative is the most ambitious of the five alternatives identified for consideration.

#### **EVALUATION OF ALTERNATIVES**

Nine criteria are used to evaluate the different munitions response alternatives individually and against each other in order to select a remedy.

This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The detailed "Comparative Screening of Response Alternatives" can be found in the FS Report.

The Remedial Investigation did not find any physical evidence to indicate that the site had been used as a target or disposal area. It is important to note that there is a low probability of encountering additional MEC at the site and that the clearance alternatives (Alternative 3, Alternative 4, and Alternative 5) would only be more protective, more permanent, and promote reduction through treatment if additional MEC are present at the site.

#### **1. Overall Protection of Human Health and the Environment**

Although the risk level in the upland portions of the site is low, there is a need to protect human health and the environment from that potential explosive safety risk. Viable alternatives include Alternative 2, Alternative 3, Alternative 4, and Alternative 5. Alternative 1 does not meet ARARs.

Because Alternative 1 does not involve any actions to mitigate risks, it would be less protective of human health and the environment, if additional MEC is encountered at the site. For this reason, this alternative is eliminated from consideration under the remaining eight criteria.

## 2. Compliance with ARARs

Compliance with ARARs has been ranked equally among alternatives 2, 3, 4 and 5, as full compliance with ARARs is expected with minimal impact to the environment.

## 3. Long-Term Effectiveness and Permanence

Alternative 5 ranks best in term of long-term effectiveness and permanence because it would reduce both surface and buried MEC in the undisturbed portion of the former bivouac area, if additional MEC are present at the Site.

Alternative 4 ranks second best because it would reduce both surface and buried MEC in the recreational areas within the former bivouac area, if additional MEC are present at the site. Alternative 3 ranks third best, if additional MEC are present at the site. Alternative 2 ranks fourth.

## 4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Alternative 3, Alternative 4, and Alternative 5 would reduce MEC, if additional MEC are present at the site. Alternative 5 ranks best because it would reduce surface and buried MEC in the undisturbed portion of the former bivouac area, if additional MEC are present at the site. Alternative 4 ranks second best because it would reduce surface and buried MEC in the recreational areas of the former bivouac area, if additional MEC are present at the site. Alternative 3 ranks third best, if additional MEC are present at the site. Alternative 2 would not achieve reduction of toxicity, mobility, or volume through treatment.

## 5. Short-Term Effectiveness

Alternative 2 ranks best because it reduces risk upon implementation, requires little time to implement, and has minimal adverse effect on the human health and the environment. Alternative 3 ranks second best as it reduces risk upon implementation, requires less time and effort to implement than Alternative 4 and results

in fewer human health and environmental impacts. Alternative 4 ranks third because it requires less time and effort to implement than Alternative 5 and results in fewer human health and environmental impacts. Alternative 5 ranks fourth.

## 6. Implementability

Alternative 2 ranks best in terms of implementability because the supplies and personnel needed to conduct educational programs are readily available and they can be deployed in a relatively shorter length of time than that required to implement a removal action. It should be noted that Alternative 2 requires significant logistical and management support because the process must be conducted in close coordination with local agencies, landowners, and the community. Alternative 3 ranks second best because it requires fewer personnel resources, materials, and services over time to implement than Alternative 4. Alternative 4 ranks third because it requires fewer resources over time than Alternative 5. Alternative 5 ranks fourth.

## 7. Cost

Cost was evaluated over a 30 year period. Alternative 2 is the least costly of the alternatives at \$397,000. Alternative 3 ranks second at \$644,000. Alternative 4 ranks third at \$962,000. Alternative 5 ranks fourth at \$2,045,000.

## 8. State/Support Agency Acceptance

The MassDEP and USEPA support the selection of Alternative 3 (Limited Subsurface Clearance of the Recreational Areas with Public Education) as the Preferred Alternative. MassDEP will issue an official response once the public comment period has closed.

## 9. Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and those comments will be addressed in the Decision Document for the site.

### PREFERRED ALTERNATIVE

The Corps' Preferred Alternative for addressing the potential MEC risks at the site is Alternative 3 (Limited Subsurface Clearance of the Recreational Areas with Public Education). Alternative 3 is an acceptable alternative negotiated between the Corps, USEPA, and MassDEP.

The Preferred Alternative was selected over other alternatives because it:

- Reduces the potential for direct human contact with MEC that might be present at the site
- Can be implemented in a reasonable time frame
- Costs less than other remedial alternatives that use treatment as a principal element and provides an equal degree of protectiveness based on the findings and historical use of the site as a bivouac area
- Allows the property to be used for recreational land use.

Based on the information available at this time, the Corps believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Corps expects the Preferred Alternative to be protective of human health and the environment, comply with established regulations, and be cost-effective.

The Preferred Alternative does satisfy the preference for treatment as a principal element.

The Corps may modify the Preferred Alternative in response to public comments or new information.

### COMMUNITY PARTICIPATION

The Corps provided information and solicited public input to response actions at the site through public meetings, the Administrative Record file for the site, and announcements published in the Cape Cod Times. The Corps encourages the public to gain a better understanding of the site and the response actions that have been conducted.

The dates for the public comment period, the date, location, and time of the public meeting, and the locations of the Administrative Record files, are provided on the front page of this Proposed Plan.

**Comments and requests for further information on the site should be directed to:**

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## GLOSSARY OF TERMS

**Discarded Military Munitions (DMM)** – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

**Disposal** – End of life tasks or actions for residual materials resulting from demilitarization or disposition operations.

**Disposition** – The process of reusing, recycling, converting, redistributing, transferring, donating, selling, demilitarizing, treating, destroying, or fulfilling other lifecycle guidance, for DoD property.

**Explosive Hazard/Risk** – A condition where danger exists because explosives are present that may react (e.g., detonate, deflagrate) in a mishap with potential unacceptable effects (e.g., death, injury, damage) to people, property, operational capability, or the environment.

**Material Potentially Presenting an Explosive Hazard (MPPEH)** – Material owned or controlled by the Department of Defense that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris) or potentially contains a high enough concentration of explosives that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions DoD I 4140.62, November 25, 2008 production, demilitarization, or disposal operations). Excluded from MPPEH are munitions within the DoD-established munitions management system and other items that may present explosion hazards (e.g., gasoline cans and compressed gas cylinders) that are not munitions and are not intended for use as munitions.

**Military Munitions** – Military munitions means all ammunition products and components produced for or used by the armed forces for

national defense and security, including confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof.

**Munitions and Explosives of Concern (MEC)** – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC) present in high enough concentrations to pose an explosive hazard.

**Munitions Constituents (MC)** – Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Munitions Debris (MD)** – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

**Munitions Response** – Response actions, including investigation, removal actions and remedial actions to address the explosives safety, human health, or environmental risks presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required.

**Unexploded Ordnance (UXO)** – Military munitions that have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded either by malfunction, design, or any other cause.



**USE THIS SPACE TO WRITE YOUR COMMENTS**

Your input on the Proposed Plan for the site is important to the Corps. Comments provided by the public are valuable in helping the Corps select a final remedy for the site.

You may use the space below to write your comments. Comments must be postmarked by October 7, 2013 and sent to the address provided on page 7. If you have any questions about the comment period, please contact Stephen Dunbar at (978) 318-8381.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State Zip \_\_\_\_\_

Comments: