

U.S. Army Corps of Engineers, Los Angeles District
Formerly Used Defense Sites (FUDS) Program

PROPOSED PLAN

FOR

Former Camp Elliott, East Elliott Munitions Response Site (MRS) 01, San Diego County, California

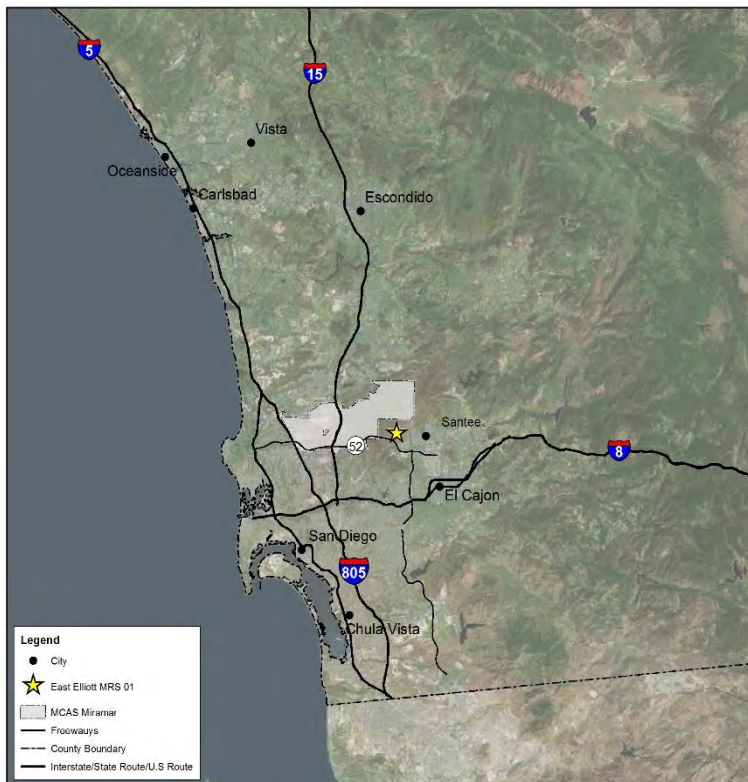
FUDS Project No. J09CA006703



INTRODUCTION

The U.S. Army Corps of Engineers (USACE) presents this Proposed Plan (PP) to allow the public an opportunity to review and comment on the Preferred Alternatives for **Former Camp Elliott, East Elliott Munitions Response Site (MRS) 01 – Range Complex (Project 03)** (hereafter referred to as **East Elliott MRS 01**) located in San Diego County, California. Figure 1 shows the location of **East Elliott MRS 01**.

Figure 1: East Elliott MRS 01 Site Location



MARK YOUR CALENDARS

PUBLIC COMMENT PERIOD:

June 18, 2018 through July 20, 2018

USACE will accept written comments on the Proposed Plan during the public comment period. Comment letters must be postmarked by July 20, 2018, and should be submitted to:

Mr. Randy Tabije
United States Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, CA 90017-3401
Phone: (951) 898-6144
Fax: (213) 452-4213
Email: roland.r.tabije@usace.army.mil

To request an extension of the public comment period, send a written request to Mr. Tabije by July 12, 2018.

PUBLIC MEETING:

June 20, 2018, 6-8pm

USACE will host a public meeting to explain the Proposed Plan and all of the alternatives resulting from the FS (the study completed prior to this Proposed Plan). Oral and written comments will be accepted at the meeting, held at:

City of Santee Civic Center, Building 8A
1601 Magnolia Avenue, Santee, CA 92071

FOR MORE INFORMATION:

Project documents are available in the Administrative Record file, which includes a copy of the *R/FS Report*, at the following location:

San Diego County Public Library, Santee Branch
9225 Carlton Hills Blvd #17, Santee, CA
Contact: (619) 448-1863

This document discusses the rationale for selecting Preferred Alternatives for **East Elliott MRS 01**. USACE, Los Angeles District, which is the lead agency for this munitions response, issued this PP for **East Elliott MRS 01**. The California Department of Toxic Substances Control (DTSC), which is the

regulatory agency, has reviewed this PP. USACE, Los Angeles District, is presenting this information to keep the public fully informed of the decision-making process regarding impacts from former military use in **East Elliott MRS 01**; fulfilling the public participation requirements under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 United States Code [USC] §9617(a) and the National Oil and Hazardous Substances Pollution Contingency Plan [40 Code of Federal Regulations [CFR] §300.430(f)(2)].

USACE identified seven sub-areas (**East Elliot MRS 01a** through **East Elliot MRS 01g**) within **East Elliott MRS 01**. USACE based the sub-areas on historical use, results of previous investigations, and the reasonably anticipated future land use. Figure 2 shows the sub-areas. Table 1 summarizes information about each **East Elliott MRS 01** sub-area including the selected Preferred Alternative for each sub-area. Each Preferred Alternative is specific to that particular sub-area. As such, the Preferred Alternatives may differ.

FIGURE 2 EAST ELLIOTT MRS 01 LAYOUT AND SUB-AREAS

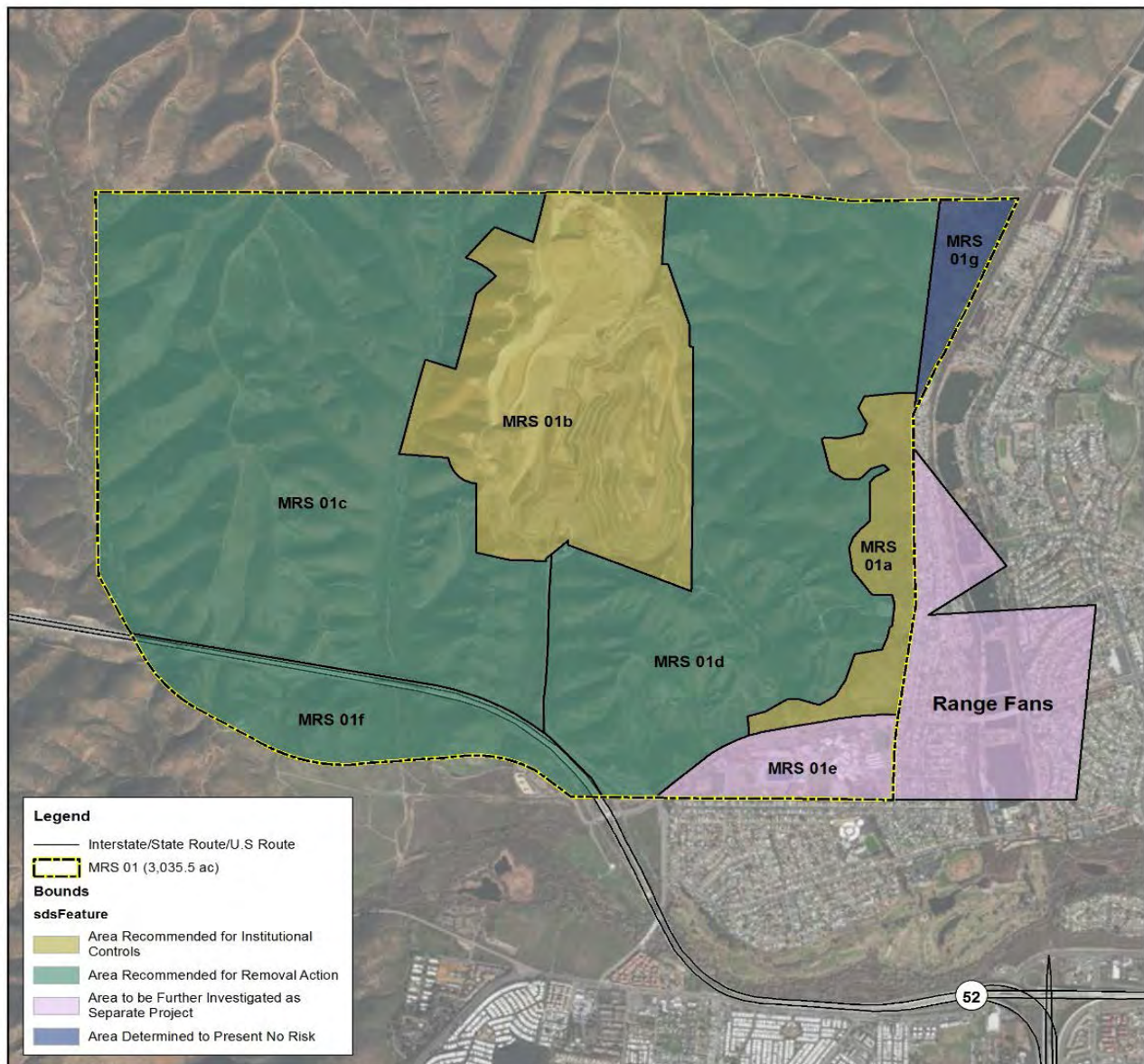


Table 1: East Elliott MRS 01 Sub-Area Descriptions

| MRS Sub-area | Acreage | Current Land Use | Future Land Use | Preferred Alternative |
|--------------|---------|---|---|--|
| 01a | 120.6 | Residential | Residential | Alternative 2 |
| 01b | 523.3 | Landfill | Landfill | Alternative 2 |
| 01c | 1,177.3 | Undeveloped | Recreational as part of Mission Trails Regional Park (MTRP) | Alternative 6 |
| 01d | 867.4 | Undeveloped | Recreational as part of MTRP | Alternative 6 |
| 01e | 93.2 | West Hills High School and recreational | West Hills High School and recreational | USACE has designated the East Elliott MRS 01e , along with an area of range fans located to its east boundary as a new project. As such, USACE will develop a PP for it after further evaluation and coordination with DTSC. This sub-area will not be further addressed as part of this PP. |
| 01f | 198.9 | Recreational within MTRP | Recreational within MTRP | Alternative 6 |
| 01g | 54.8 | Undeveloped | Recreational as part of MTRP | USACE's archival research did not discover historical information that indicates these 54.8 acres were included within operational range fans the military used for training at Camp Elliott. As such, at the conclusion of the RI, USACE assigned this sub-area a "No Risk" determination, and did not evaluate it during the FS. |

This PP identifies the Preferred Alternatives for protecting receptors from explosive hazards associated with Department of Defense (DoD) Military Munitions (munitions) that may be Munitions and Explosives of Concern (MEC) that remain within the **East Elliott MRS 01 sub-areas**. In this PP, USACE both provides the rationale for each Preferred Alternative and includes summaries of the other remedial alternatives it evaluated based on the reasonably anticipated future use for each of the **East Elliott MRS 01 sub-areas**. The alternatives are identified below. Details regarding the decision process and the alternatives selection are discussed in the Summary of Remedial Alternatives and Summary of Preferred Alternatives sections.

- Alternative 1: No Action;
- Alternative 2: Institutional Controls (ICs) to Protect Current and Future Site Users;
- Alternative 3: Removal of DoD Military Munitions from the Surface with ICs to Protect Current and Future Site Users;

- Alternative 4: Digital Geophysical Mapping (DGM) and Surface and Subsurface Removal of DoD Military Munitions to a Depth of 36 inches Below the Ground Surface (BGS) with ICs to Protect Current and Future Site Users;
- Alternative 5: DGM with Advanced Geophysical Classification (AGC) Sensor and Surface and Subsurface Removal of DoD Military Munitions to a Depth of 36 inches BGS with ICs to Protect Current and Future Site Users;
- Alternative 6: DGM and Surface and Subsurface Removal of DoD Military Munitions to a Depth of 36 inches BGS with ICs to Protect Current and Future Site Users for Delineated Response Areas¹ within East Elliott MRS 01c, 01d, and 01f; and
- Alternative 7: Excavation, Sifting, Removal of DoD Military Munitions and Munitions Debris (MD), and Restoration.

PUBLIC INVOLVEMENT PROCESS

USACE encourages property owners and other interested parties to review this document and submit comments. USACE will consider the public comments before selecting and approving the Preferred Alternative for each of the MRS sub-areas that make up the **East Elliott MRS 01**.

USACE will accept comments during the public comment period which will begin prior to the public meeting. USACE will present the PP at the public meeting. USACE will also accept verbal and written comments at the public meeting. USACE will document and consider comments before selecting the final remedy. The first page of this PP provides the location, date and time of the public meeting, and the location of the Administrative Record file for **East Elliott MRS 01**.

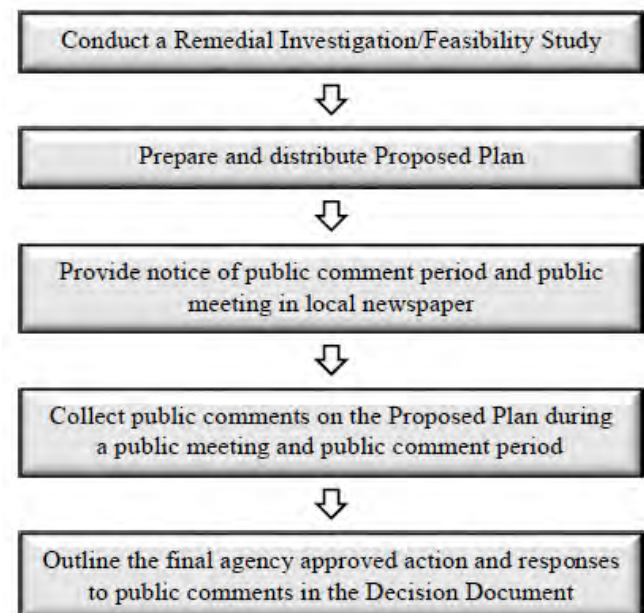
The PP and the *Remedial Investigation/Feasibility Study (RI/FS) Report* are a part of the **East Elliott MRS 01** Administrative Record file that contains the documents used in making decisions on remedial projects at the site.

This PP identifies the recommended Preferred Alternative for each **East Elliott MRS 01 sub-area** and provides the rationale for the Preferred Alternative. The proposed Preferred Alternative for each **East Elliott MRS 01 sub-area** is based on the RI's findings and during discussions among the lead and support agencies, the affected community, and other stakeholders.

This PP:

- Presents basic background information;
- Identifies the Preferred Alternative for each **East Elliott MRS 01 sub-area** and explains the rationale for each identified alternative;

Figure 3: East Elliott MRS 01 Decision Document Process



¹ Delineated response areas within the **East Elliott MRS 01 sub-areas** are areas such as trails, utility trenches, and high density geophysical anomaly areas as defined in the MTRP Master Plan and based the results of the RI geophysical anomaly analysis (Refs. 3 and 4)

- Encourages public review and comment on the recommended Preferred Alternatives; and
- Provides information on how the public can be involved in the process.

One or more Decision Documents (DD) will provide the final Selected Remedy for **East Elliott MRS 01 sub-areas**. The DD's "Responsiveness Summary" section will include USACE's responses to public comments. Figure 3 summarizes the various steps in the development and approval process for the **East Elliott MRS 01 sub-area** DDs. After consideration of each comment, USACE will approve the required DDs.

SITE HISTORY AND BACKGROUND

This PP summarizes information that can be found in greater detail in the *RI/FS Report* (Ref. 3) and other documents contained in the Administrative Record file for **East Elliott MRS 01**. USACE encourages the public to review these documents to gain a more comprehensive understanding of **East Elliott MRS 01** and previous remedial activities that have been conducted at the **East Elliott MRS 01**.

East Elliott MRS 01 is situated in northeast San Diego County approximately 12 miles northeast of downtown San Diego and adjacent to the City of Santee (Figure 1). USACE has sub-divided the **East Elliott MRS 01**, which comprises approximately 3,035.5 acres, into sub-areas **East Elliott MRS 01a** through **East Elliott MRS 01g** (Figure 2).

In 1940, the U.S. Marine Corps (USMC) established Camp Holcomb as a development and training center on approximately 19,000 acres. Camp Holcomb was renamed Camp Elliott in June of 1940. Camp Elliott, which was expanded to approximately 30,500 acres, housed the Second Marine Division and later served as home to the USMC Headquarters Command, Fleet Marine Training Center, Troop Training Unit, Marine Barracks, and Base Depot. The USMC established specialty camps within or near Camp Elliott for parachutists (Camp Gillespie to the southeast); scouts, snipers, and officer candidates (Green's Farm in the north-central portion of Camp Elliott); replacement troops awaiting overseas posting (Linda Vista Camp); and tank training (Jacques Farm) (Ref. 5).

The USMC activated the Camp Elliott Tank School at Jacques Farm in 1942 (Ref. 5). Jacques Farm was approximately 6.4 miles southwest of the **East Elliott MRS 01**. Training at Jacques Farm included gunnery instruction with live-firing training exercises using 37 millimeter (mm) and 75mm artillery, and machine guns. Based on analysis of a firing range map, the nature and estimated quantity of munitions potentially present on the west face of Fortuna Mountain, and the results of investigations, USACE determined that most of the live-fire training the USMC conducted at the training school was directed toward the northeast, relying on Fortuna Mountain as a natural backstop (Ref. 5). Stray munitions fired over Fortuna Mountain may have resulted in the presence of DoD Military Munitions in the vicinity of **East Elliott MRS 01**.

In November 1942, an Anti-Tank Section was activated at Camp Elliott. Anti-tank weapons included half-track-mounted 75mm guns and jeep-mounted 37mm guns. Training included live-firing at stationary and moving targets on anti-tank ranges, one of which appears to have been approximately 2 miles west of **East Elliott MRS 01** and 2/3 mile east of the main Camp Elliott. Firing from this range was probably toward the east in the direction of the northwest corner of **East Elliott MRS 01** (Ref. 5). Evidence of live-fire training in the impact area extending from the anti-tank range to the western boundary of **East Elliott MRS 01** included 60mm to 150mm high explosive (HE) rounds, 60mm to 81mm HE mortar fins, 3.5-inch bazooka rockets, and a live M49 trip flare. Based on archival research and investigations,

USACE determined that mortar and artillery crews most likely also fired white phosphorus munitions (Ref. 7).

Following World War II and up until 1953, Camp Elliott was used as a United States Navy Training and Redistribution Center where, reportedly, live-fire training was not conducted. DoD ended its use of the **East Elliott MRS 01** with the closure of Camp Elliott in 1960 (Ref. 5).

In 1961, DoD declared approximately 15,000 acres, including **East Elliott MRS 01**, as surplus land. With this declaration, DoD transferred this acreage to the General Services Administration (GSA) for disposition. In 1962, the GSA solicited bids for sale of this land, and by 1974, sold most of the surplus land, including the acreage that composes **East Elliott MRS 01**, to real estate developers, private parties, and municipalities (Ref. 6).

Since the 1970s, DoD Military Munitions, including munitions determined by qualified personnel to be MEC, and MD have been encountered at several locations within **East Elliott MRS 01**. Most of these munitions were 37mm and 75mm projectiles and associated MD (e.g., fragments) that were most likely used during live-fire training. The majority of the munitions and MD encountered were located in the southeast portion of **East Elliott MRS 01**. In addition, brush fires in the **East Elliott MRS 01** area have reportedly detonated munitions that were present (Ref. 6).

Bristol Environmental Remediation Services, LLC (Bristol) of Anchorage, Alaska under contract with USACE, completed a *RI/FS Report* for **East Elliott MRS 01** in February 2018. USACE developed this PP based on findings of the *RI/FS Report* (Ref. 3).

SITE CHARACTERISTICS

Current and Anticipated Future Land Use

Table 1 indicates the current and anticipated future land use for each **East Elliott MRS 01 sub-area**.

Topography

East Elliott MRS 01 lies within the coastal plain of the Peninsular Range physiographic province of Southern California (Ref. 3). Elevation ranges from less than 340 feet (ft.) to slightly more than 1,000 ft. above mean sea level (amsl) within the MRS. The physiography of the MRS is characterized by a series of subparallel, north–south-trending canyons that drain southward. The canyons throughout **East Elliott MRS 01** are separated by several ridges that have been heavily dissected by erosion. The canyons include (from west to east) Oak Canyon, Spring Canyon, Little Sycamore Canyon, and Sycamore Canyon. Quail Canyon, a smaller tributary canyon in the northeast part of the MRS, converges with Sycamore Canyon from the northwest.

Soils

Soils present at **East Elliott MRS 01** are poorly developed (i.e., rocky) and relatively thin (i.e., less than 3 ft. thick) (Ref. 3). Soil types are based on parent rock type and slope angle and are commonly described using texture-based terminology and referred to as “sandy loam.” Sandy loams consist of roughly equal portions of sand, silt, and clay. Soils are thicker in the canyon areas due to accumulation of unconsolidated materials at slope bases and are thinner on slopes and ridges.

Plant Resources

A total of 166 plant species have been identified within the MRS. Of this total, 120 (72%) are species native to southern California. Table 2 presents the plant communities present in **East Elliott MRS 01 sub-areas** (Ref. 3):

| MRS Sub-area | Diegan Coastal Sage Scrub | Diegan Coastal Sage Scrub/Grassland | Southern Mixed Chaparral | Chamise Chaparral | Sycamore Alluvial Woodland | Mulefat Scrub | Native Grassland | Non-native Grassland | Disturbed Habitat |
|--------------|---------------------------|-------------------------------------|--------------------------|-------------------|----------------------------|---------------|------------------|----------------------|-------------------|
| MRS 01a | ✓ | ✓ | | | | | | ✓ | ✓ |
| MRS 01b | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| MRS 01c | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| MRS 01d | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| MRS 01f | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| MRS 01g | ✓ | ✓ | | | | | | | |

Special Status Listed Taxa (Animal and Plant Resources)

The Endangered Species Act is intended to prevent the extinction of plant and animal species, provide a means to conserve the ecosystems on which endangered and threatened species depend, and to provide a program for conservation and recovery of these species. Table 3 lists the federal-listed Threatened and Endangered (T&E) species with the potential to occur at **East Elliott MRS 01**. Critical habitat, as designated by the U.S. Fish and Wildlife Service, has not been identified within the MRS boundary; however, suitable habitat (e.g., an area in which a species can or does occur) for all six T&E species has been identified within the MRS.

| Species | Federal Status | Federal T&E Species Status |
|--------------------------------|----------------|---|
| Crustacean | | |
| San Diego Fairy Shrimp | Endangered | One observation of the San Diego fairy shrimp has been documented within MRS 01c and two observations have been documented south of MRS 01f . |
| Birds | | |
| Coastal California Gnatcatcher | Threatened | Documented observations of the coastal California gnatcatcher have been made throughout all the MRS 01 sub-areas . |
| Least Bell's Vireo | Endangered | Two observations of the least Bell's vireo have been documented within MRS 01f and suitable habitat is present within MRS 01c , MRS 01f , and MRS 01g . |
| Plants | | |
| San Diego Ambrosia | Endangered | Suitable habitat for the San Diego ambrosia is present in MRS 01c and MRS 01f . |

Table 3: T&E Species with Potential to Occur at East Elliott MRS 01

| Species | Federal Status | Federal T&E Species Status |
|-------------------|----------------|--|
| Del Mar Manzanita | Endangered | MRS 01c, MRS 01b, and MRS 01f have suitable habitat that has the potential to support scattered individuals of Del Mar manzanita. |
| Willow Monardella | Endangered | Suitable habitat for willow monardella occurs along waterways within MRS 01b, MRS 01c, and MRS 01f . |

Regardless of the Preferred Alternatives chosen based on this PP, munitions response and other project actions must comply with substantive Endangered Species Act requirements regarding take of listed species and avoiding jeopardy. USACE will coordinate remedy design and incorporation of avoidance and minimization measures with the U.S. Fish and Wildlife Service.

Surface Water/Groundwater/Wetlands

Ephemeral streams in **East Elliott MRS 01** canyons flow southward into the westward-flowing San Diego River. Streambeds are dry for the majority of the year. Flowing water is confined to episodic storm events during the annual rainy season (November to March) (Ref. 3).

The MRS is part of the Upper San Diego River Basin. Groundwater depth and flow direction within the MRS are described below based on monitoring USACE performed in June 2010 for Sycamore Landfill (Ref. 3):

- Groundwater depth ranged from approximately 10 to 335 ft. bgs (depending on topography); and
- The groundwater flow direction was south to southwest.

USACE regulates discharges of dredged and fill material into waters of the United States, which includes many streams and wetlands such as those on East Elliott MRS 01. USACE, Los Angeles District, Regulatory Branch has performed an analysis of existing data regarding the presence of jurisdictional waters (i.e., waters regulated under the Clean Water Act) within **East Elliott MRS 01**. As a result, USACE has determined that jurisdictional waters including ephemeral streams and wetlands are present in **East Elliott MRS 01a, East Elliott MRS 01c, East Elliott MRS 01d, and East Elliott MRS 01g**. USACE also determined that jurisdictional waters are not present in the remainder of **East Elliott MRS 01**.

Prehistoric and Historic Cultural Resources

Archaeological studies conducted in 2003 in support of the construction planned with **East Elliott MRS 01a** included a records search and intensive field survey (Ref. 3). The records search was conducted for a one-mile radius of **East Elliott MRS 01a** and included research at the South Coastal Information Center at San Diego State University and the San Diego Museum of Man. The search identified 39 cultural resources within that radius. All of the resources identified by the records search are prehistoric sites, the majority of which are temporary habitation sites and lithic scatters. USACE identified five sites on **East Elliott MRS 01a**. Based on analysis of this information, it appears that the additional cultural sites may be located in sub-areas **East Elliott MRS 01b** and **East Elliott MRS 01d**, but not in **East Elliott MRS 01c, East Elliott MRS 01f, or East Elliott MRS 01g**. Prior to conducting any remedial actions in sub-areas, additional archaeological studies will need to be performed to determine the impact that remedial actions may have on cultural resources.

SUMMARY OF PREVIOUS INVESTIGATION RESULTS

Previous investigations were conducted at **East Elliott MRS 01** from 1984 to 2013. The below provides a brief summary of the previous investigations and site visits at **East Elliott MRS 01**.

1984 Clearance Activities – The U.S. Army 70th Ordnance Detachment (Explosive Ordnance Disposal [EOD]) conducted a munitions survey within a 170-acre area near the southeast corner of **East Elliott MRS 01**. The location was selected by the San Diego County Sheriff's Department and Office of Disaster Preparedness. The survey findings included:

- Moderate to heavy munitions presence was found within the 170-acre survey area; and
- The evidence of munitions use was mostly fragments from HE projectiles (Ref. 8).

1994 Removal Activities – USACE performed surface subsurface investigation for munitions (at the time referred to as ordnance and explosives waste sampling) within 11 grids (100 ft. by 100 ft.) located within **East Elliott MRS 01** (Ref. 9). UXO teams conducted surface and subsurface investigations where munitions were suspected to be present. The search was conducted using both visual and geophysical investigation techniques and was conducted to a depth of three feet bgs. The maximum depth at which MD was encountered was 12 inches bgs. Only a single fuze component was encountered on the surface. A total of 2.53 acres were surveyed across the grid (Ref. 9).

1996 Munitions Investigation (at the time referred to as *Ordnance and Explosives Sampling*) – USACE conducted a statistically-based geophysical survey at **East Elliott MRS 01** to estimate the density of munitions present within different portions of the MRS (Ref. 8). This investigation was part of the Engineering Evaluation/Cost Assessment (EE/CA). As a result of this investigation, anomalies were detected and investigated. Munitions, some of which qualified personnel determined were MEC, were removed from **East Elliott MRS 01b**, **East Elliott MRS 01c**, and **East Elliott MRS 01d**. MEC was not encountered in **East Elliott MRS 01a** or **East Elliott MRS 01g**. Qualified personnel determined that four munitions (75mm HE projectiles) encountered during this investigation were MEC. In addition, a larger number of fragments and expended fuzes were found. Munitions were not encountered deeper than 10 inches bgs. Additionally, MD was not encountered deeper than 18 inches bgs. During the 1996 investigation, 27 munitions were encountered and disposed of by detonation in place or at a consolidated location. In addition, USACE removed 758 pounds of MD during this investigation (Ref. 10).

1998-1999 Construction Support and Time Critical Removal Action (TCRA) – USACE provided construction support that resulted in munitions removal operations at **East Elliott MRS 01** during the expansion of Sycamore Landfill. USACE amended the scope of the construction support provided during this expansion to include a TCRA to remove munitions from the surface in an area that included **East Elliott MRS 01a**, **East Elliott MRS 01d**, and **East Elliott MRS 01g**. USACE provided construction support between January and April 1998, and completed the TCRA between July 1998 and February 1999. During the landfill expansion, USACE encountered and destroyed by detonation 24 munitions determined to be MEC. The maximum depth at which munitions were encountered was 12 inches bgs. During the TCRA, USACE encountered 24 munitions determined to be MEC on the surface. These munitions were destroyed by detonation. USACE encountered a total of 48 munitions that were determined to be MEC. Each munition and MD encountered were evaluated to determine its explosives safety status, with munitions and MD for which the explosives safety status was determined to be material documented as safe (MDAS) (totaling 1,348.5 pounds) disposed of as scrap (Ref. 10).

1999 Engineering Evaluation/Cost Analysis – USACE completed an EE/CA for **East Elliott MRS 01** (Ref. 7). This EE/CA assessed potential risk associated with the MRS. The EE/CA used data collected during the 1996 *Munitions Investigations* (see above) and previous investigations to identify and recommend alternative actions for each of four sectors within the MRS. The EE/CA identified four sectors within East Elliott MRS 01. The boundaries for the sectors are not consistent with the boundaries for the current sub-areas. Therefore, in the description of the recommendations from the EE/CA, several sub-areas are noted in association with more than one sector. The below recommendations were made in the *EE/CA Report* for each **East Elliott MRS 01 sub-area** (Ref. 7):

- Sector 1 – Surface Removal of Munitions. This alternative was recommended because it would significantly reduce the probability that recreational users would encounter munitions. As such, it reduces the risk associated with munitions that may be present on the surface. The northern portion of **East Elliott MRS 01c** and a small portion of the western side of **East Elliott MRS 01b** are located within this sector.
- Sector 2 – Surface Removal of Munitions. This alternative was recommended to be implemented in areas near the landfill that had not already been developed. As for Sector 1, this reduces the probability that people would encounter munitions on the surface. As such, it reduces the risk associated with munitions that may be present on the surface. The majority of **East Elliott MRS 01b** and small portions of **East Elliott MRS 01c** and **East Elliott MRS 01d** are located within this sector.
- Sector 3 – ICs, which include the use of warning signs and implementation of a 3Rs Explosives Safety Education Program (3Rs Program) that include 3Rs display boards intended to modify behavior of people who may encounter a munition. USACE based this recommendation on the unlikely potential that munitions would be encountered. The southern portion of **East Elliott MRS 01c** and **East Elliott MRS 01f** are located within this sector.
- Sector 4 – Surface and Subsurface Removal of Munitions. This alternative was recommended because it would result in the greatest reduction of risk associated with munitions for recreational users. **East Elliott MRS 01a**, the majority of **East Elliott MRS 01d**, and **East Elliott MRS 01g** are located within this sector.

The remedial alternatives recommended in the *EE/CA Report* were not implemented and the MRS was recommended for RI.

2003 Equestrian Staging Area Construction Support – USACE provided construction support for and a subsurface removal of munitions within a 12-acre equestrian staging area within MTRP (Ref. 3). This 12-acre area is located just south of and adjacent to the southern boundary of **East Elliott MRS 01f**. Over 500 anomalies were detected and investigated. Neither munitions nor MD were encountered.

2004 Sycamore Landfill Construction Support – USACE provided construction support and completed a removal action within 287 acres of this acreage of the **East Elliott MRS 01b** (Ref. 3). One purpose for these actions was to remove munitions from this acreage to support expansion of Sycamore Landfill. USACE conducted fieldwork from September 2004 to July 2005. During this investigation, which included 78,000 excavations, resulted in the recovery and disposal of 23 munitions that were determined to be MEC. It also resulted in the recovery of 105 pieces of MD that were documented as safe. The maximum depth at which munitions were encountered was 36 inches bgs, with MD only encountered to 30 inches bgs.

2004 Archives Search Report – USACE summarized information from historical records regarding the various live-fire training ranges associated with **East Elliott MRS 01** during World War II (Ref. 8). The range complex was comprised of nine overlapping ranges. Of these ranges, six had firing positions located within areas that are now part of either USMC Air Station Miramar or the San Diego community of Tierrasanta.

2005 Munitions Constituents Sampling – USACE completed munitions constituents (MC) sampling, analysis, and evaluation in Sector 4, which included **East Elliott MRS 01a**, **East Elliott MRS 01d**, and **East Elliott MRS 01g**. Sample locations were selected in proximity to locations where munitions were encountered during previous investigations. The results of this sampling indicated that MC that were explosives (e.g., 2,4,6-trinitrotoluene [TNT], hexahydro-1,3,5-trinitro-1,3,5-triazine [RDX]) were not detected in the soil above environmental comparison criteria (Ref. 11); however, several metals were detected above environmental comparison criteria in the soil. Of the metals detected, only lead and barium were identified as potential MC from munitions used at **East Elliott MRS 01**. The report also indicated that other sources of lead may include natural occurrence, fertilizer application, defoliant application, gasoline, and exhaust from vehicular activity in the immediate or adjacent areas. However, the study concluded that the sampling results were not conclusive to discern if an environmental impact from munitions use occurred (Ref. 11).

2007 Surface Munitions Removal Action – USACE completed a grid survey and surface removal of munitions at MTRP (Ref. 14). The area encompassed approximately 1,020 acres, including **East Elliott MRS 01f**. Although munitions were not encountered, 19 MD items (i.e., fragments for 75mm projectile fragments, base detonating fuzes, and barrage rocket warheads and motors) were encountered. Only one of these (a 75mm projectile fragment) was encountered within the boundary of **East Elliott MRS 01f**.

2016-2017 Site Development East Elliott MRS 01a – During 2016-2017, the landowner developed the 120.6-acre **East Elliott MRS 01a**. Qualified UXO personnel assessed the site for explosive hazards during the development, which included extensive soil grading and earth-movement of 1.2 million cubic yards of soil, and no munitions were recovered.

SUMMARY OF REMEDIAL INVESTIGATION RESULTS

2013 – 2018 Remedial Investigation/Feasibility Study – USACE conducted an RI to characterize the nature and extent of munitions and MC, fill data gaps, and assess potential explosives safety hazards within the **East Elliott MRS 01**. The FS evaluated remedial alternatives for their ability to reduce the potential explosives hazards associated with munitions posed to property owners and the general public (Ref. 3).

Accord Engineering, Inc. (Accord), under a USACE contract, conducted an RI at **East Elliott MRS 01** from December 2012 through March 2014. The RI included the conduct of a geophysical survey using DGM towed-array and man-portable equipment. The RI also included environmental sampling, including sampling of background soil, and analysis. During the RI, intrusive investigation of detected geophysical anomalies was not conducted. The DGM data collected during the RI identified the boundaries of the potential impact areas, while the results of previous investigations at **East Elliott MRS 01** provided data to identify the potential munitions present. Collectively, these investigations, which bounded the impact areas and identified the munitions potentially present, satisfied the criteria for characterizing the nature and extent of munitions present.

Bristol used the RI data collected by Accord during the RI field operations to support the preparation of the *RI/FS Report*. The RI portion of the *RI/FS Report* characterizes the nature and extent of munitions and MC that may be present at **East Elliott MRS 01**. The FS portion of the *RI/FS Report* used information from the RI to develop, evaluate, and comparatively analyze potential remedial alternatives for each MRS sub-area.

Munitions and Explosives of Concern Characterization

Results of the RI field characterization effort confirmed the munitions information gleaned from archival research, investigations, and site visits. During the RI, munitions were not recovered within **East Elliott MRS 01**; however, MD (five projectile fragments) was identified on the surface within **East Elliott MRS 01b** and **East Elliott MRS 01d**. Archival research indicated DoD's use of, and the presence and distribution of munitions and MD observed or encountered during previous investigations confirm that the USMC used **East Elliott MRS 01** as an artillery and tank training area (Ref. 3). A summary of the characterization results for each **East Elliott MRS 01 sub-area** is provided below:

- **East Elliott MRS 01a** comprises approximately 120.6 acres. Historical information indicates the USMC used this area as an impact area for live-fire artillery and tank training. However, there was also physical evidence to indicate that DoD (USMC) conducted munitions-related activities (live-fire) within this sub-area.). Munitions and MD were removed from accessible areas within this sub-area during the TCRA USACE completed in 1998-1999.

Neither munition nor MD was encountered at **East Elliott MRS 01a** during RI field operations. However, intrusive investigations of detected anomalies were not conducted during the RI's field operations. The results of the RI's DGM surveys and previous investigations were analyzed using Visual Sample Plan (VSP) software and ArcGIS software to identify areas within this sub-area that exceeded an estimated 400 geophysical anomalies per acre. An estimate of this nature would indicate activities (e.g., live-fire into an impact area) that created a clustering of anomalies. The VSP calculated Anomaly densities throughout most of this sub-area to be less than 50 anomalies per acre, with a maximum density of 315 anomalies per acre. According to the ArcGIS analysis, the mean density of munitions within **East Elliott MRS 01a** is 0.12 UXO/acre. This geophysical data indicates that a potential impact areas was not present because the threshold density of 400 anomalies per acre that indicates the presence of a potential impact area was not attained.

Available data indicates munitions are not present on the surface within **East Elliott MRS 01a**. As such, an exposure pathway for surface munitions is considered incomplete. Subsurface munitions may be present; therefore, the exposure pathways for munitions within the subsurface is considered potentially complete because the subsurface geophysical anomalies have not been investigated.

- **East Elliott MRS 01b** comprises approximately 523.3 acres. Historical information indicates the USMC used the area as an impact area for live-fire artillery and tank training. RI field operations at this MRS sub-area consisted of MC soil sampling. USACE did not conduct a geophysical survey using DGM within this area because it had previously conducted an extensive munitions removal within this sub-area. During the soil sampling activities, only a single MD, an apparent projectile fragment of approximately 1/4-inch long by 1/4-inch wide, was observed.

Previous investigations that USACE conducted covered approximately 271.9 acres of **East Elliott MRS 01b**. Given the results of these investigations, USACE does not believe that munitions

remain present within this sub-area. Therefore, USACE considers surface and subsurface exposure pathways for munitions as incomplete. USACE has not investigated approximately 218.2 acres of **East Elliott MRS 01b**, which encompasses the active landfill. However, this area has been extensively modified through cut-and-fill activities associated with the creation of the landfill. Approximately 33.2 acres within this sub-area have not been investigated. Given the presence of a landfill liner, trash, and fill dirt that would prevent a receptor from accessing native soils in which munitions may be present, USACE considers surface and subsurface exposure pathways for munitions to be incomplete.

USACE did not conduct a geophysical survey with DGM within **East Elliott MRS 01b** during the RI field operations. However, USACE analyzed data from previous investigations of this and adjacent areas to the sub-area using VSP and UXO Estimator. VSP calculated the mean average density of geophysical anomalies to be 34 anomalies per acre, with a maximum of 109 anomalies per acre. The UXO Estimator analysis indicated, a 95% confidence level, that there is less than 0.38 munitions (potential UXO) per acre.

USACE anticipates that munitions are not present on the surface or in the subsurface within the majority of **East Elliott MRS 01b** based on the results of previous actions to remove munitions from both the surface and subsurface. However, USACE considers the surface and subsurface exposure pathways for munitions in areas not previously investigated to remain potentially complete.

- **East Elliott MRS 01c** comprises approximately 1,177.3 acres. Historical information indicates this area was used as an impact area for live-fire artillery and tank training.

Neither munitions nor MD were encountered within **East Elliott MRS 01c** during RI field operations. USACE did not investigate geophysical anomalies detected during the RI field operations. USACE analyzed the results of DGM surveys from the RI and previous investigations using VSP software and UXO Estimator. USACE conducted this analysis to identify areas within the **East Elliott MRS 01c** that exceeded an estimate of 400 geophysical anomalies per acre. As previously indicated, an estimate of this nature would indicate activities (e.g., live-fire into an impact area) that created a clustering of anomalies. The estimated geophysical anomaly density within most of this sub-area was less than 50 per acre. However, the maximum density was 554 anomalies per acre. The highest density of geophysical anomalies is located in an approximately 1.5-acre area in the northwestern corner of **East Elliott MRS 01c**. The UXO Estimator analysis indicated, with a 95% confidence level, that there is less than 0.1 munitions (potential UXO) per acre.

Based on the previous identification of munitions in the surface and subsurface and of the presence of geophysical anomalies that were not intrusively investigated, there is still a potential for munitions to be present in the surface or subsurface within this MRS. However, the density analysis indicated that munitions would most likely be present in the northwest corner of **East Elliott MRS 01c**. Therefore, USACE considers the exposure pathways for surface or /subsurface munitions as potentially complete.

- **East Elliott MRS 01d** comprises approximately 867.4 acres. Historical information indicates the area was used as an impact area for live-fire artillery and tank training.

During soil sampling and blind seed program activities conducted during the RI, MD was encountered. These four fragments (MD), which were buried horizontally in the soil, appeared to be projectile fragments. USACE did not investigate geophysical anomalies identified during the RI field operations.

USACE analyzed the results of the RI's geophysical survey and previous geophysical surveys using VSP software, UXO Estimator, and ArcGIS software to identify areas within **East Elliott MRS 01d** that had more than an estimated 400 geophysical anomalies per acre. The density of geophysical anomalies within most of **East Elliott MRS 01d** was less than 100 per acre. However, the maximum density was 1,850 per acre. The area with the highest density is located in the south-central area of **East Elliott MRS 01d** to the south of the Sycamore Landfill. This area includes approximately 36.4 acres with an anomaly density of over 1,000 anomalies per acre, which is surrounded by approximately 38.7 acres with a density of over 400 anomalies per acre. Along the northwestern and southern boundaries of **East Elliott MRS 01d** are three additional areas with densities of over 400 anomalies per acres.

For **East Elliott MRS 01d**, the UXO Estimator analysis indicated, with a 95% confidence level, that there is less than 0.5 munitions (potential UXO) per acre; the ArcGIS analysis indicated areas with a potentially high density of munitions. These areas align with the delineated areas from VSP analysis, but also extend northward to where a majority of munitions were encountered during the TCRA.

During previous investigations, USACE removed munitions and MD have from **East Elliott MRS 01d**. USACE removed munitions and MD from accessible areas within this MRS during the TCRA in 1998-1999. Therefore, USACE considers the exposure pathway for surface munitions as incomplete. However, because subsurface munitions may remain present within this MRS, USACE considers the exposure pathways for munitions in the subsurface as potentially complete.

- **East Elliott MRS 01f** comprises approximately 198.9 acres that are located within the current boundary of MTRP. Historical information indicates the area was used as a buffer area for live-fire artillery and tank training. This training was directed toward the western side of Fortuna Mountain. USACE did not conduct RI field operations at **East Elliott MRS 01f** given that historical information did not indicate that the area's use as an impact area and two removal actions, which were conducted in and around **East Elliott MRS 01f** did not encounter munitions. USACE based its conclusions on results of previous investigations of this MRS.

The two removals actions addressed above were a surface removal of munitions from the entire MRS and a subsurface removal from within 12 acres adjacent to the southeastern boundary of **East Elliott MRS 01f**. USACE assumes the subsurface removal's results apply to **East Elliott MRS 01f** because the MRS' conditions and historical use are the same. A 75mm projectile fragment was encountered on the surface during a surface investigation in 2007. Previous investigations and records of the historical use of the area did not indicate the presence of munitions. Therefore, neither an intrusive investigation of anomalies nor a subsurface removal of munitions was required during the RI.

Available data indicates munitions are not likely to be present on the surface of **East Elliott MRS 01f**; therefore, USACE considers the exposure pathways for surface munitions as incomplete. Although subsurface investigations completed near **East Elliott MRS 01f** indicated that

subsurface munitions are not likely present, USACE considers the exposure pathways for subsurface munitions as potentially complete.

- **East Elliott MRS 01g**, which comprises approximately 54.8 acres, is located in the northeast corner of the acreage addressed by the RI. Based on the historical information USACE's, St. Louis District reviewed, this acreage was not used within range fans used during live-fire training at Camp Elliott and should not be included in **East Elliott MRS 01**. USACE recommended **East Elliott MRS 01g** for "No Action." As such, it was not analyzed during the FS.

Munitions Constituents Characterization

USACE conducted an assessment for the presence of residual MC through a biased sampling program for MC that were explosives and metals in surface (0 to 0.5 ft. bgs) soil. USACE collected 35 samples from potential munitions areas identified during a geophysical survey using DGM with higher density of geophysical anomalies. Each sample was analyzed for MC that were explosives (e.g., TNT, RDX) and selected metals (i.e., antimony, copper, lead, and zinc).

USACE collected a total of 30 background MC (selected metals) samples at locations outside the former range areas.

- Explosives – Analytical results for MC (explosives) were non-detect in soil samples collected within the **East Elliott MRS 01**.
- Metals – Analytical results for antimony were non-detect for soil samples collected in **East Elliott MRS 01**. Statistically significant differences were not observed in concentrations of copper, lead, or zinc for any of the data groups. There was insufficient evidence to conclude concentrations of metals were significantly greater than the background concentrations. It should be noted that the two soil types at the background site study areas were separately sampled but no significant difference in metal concentrations was detected between the two soil types for either **East Elliott MRS 01** or background study areas.

Detections of MC (explosives) or antimony were not detected within **East Elliott MRS 01** or background soil sample. However, the level of detection for one explosives compound (2,6-dinitrotoluene) was higher than the ecological risk-based screening criteria for this compound. Also, metals were not identified in **East Elliott MRS 01** soil samples at concentrations that were statistically elevated relative to background levels. Therefore, USACE determined that a potentially complete exposure pathway for MC, either metals or explosives, had not been identified for surface soil. This included for incidental ingestion, inhalation, and dermal contact for human receptors and ingestion and dermal contact for ecological receptors. Neither subsurface soil nor groundwater exposures related to leaching of contaminants of potential concern from surface soil are expected at **East Elliott MRS 01**. A soil source for MC was not identified within impact areas identified within the **East Elliott MRS 01**. As such, USACE considers the potential exposure pathways within **East Elliott MRS 01** for surface water and sediment as incomplete.

Remedial Investigation Results Conclusions

The project objectives for the RI field operations included collecting geophysical data to accurately locate and record the locations of geophysical anomalies (e.g., potential MEC or MD) for the purpose of identifying high density areas (potentially indicative of impact areas) and to collect surface soil samples to determine if MC are present at concentrations greater than background levels, which may indicate a potential release of MC resulting from the presence of MEC.

RI findings with regard to munitions and MC:

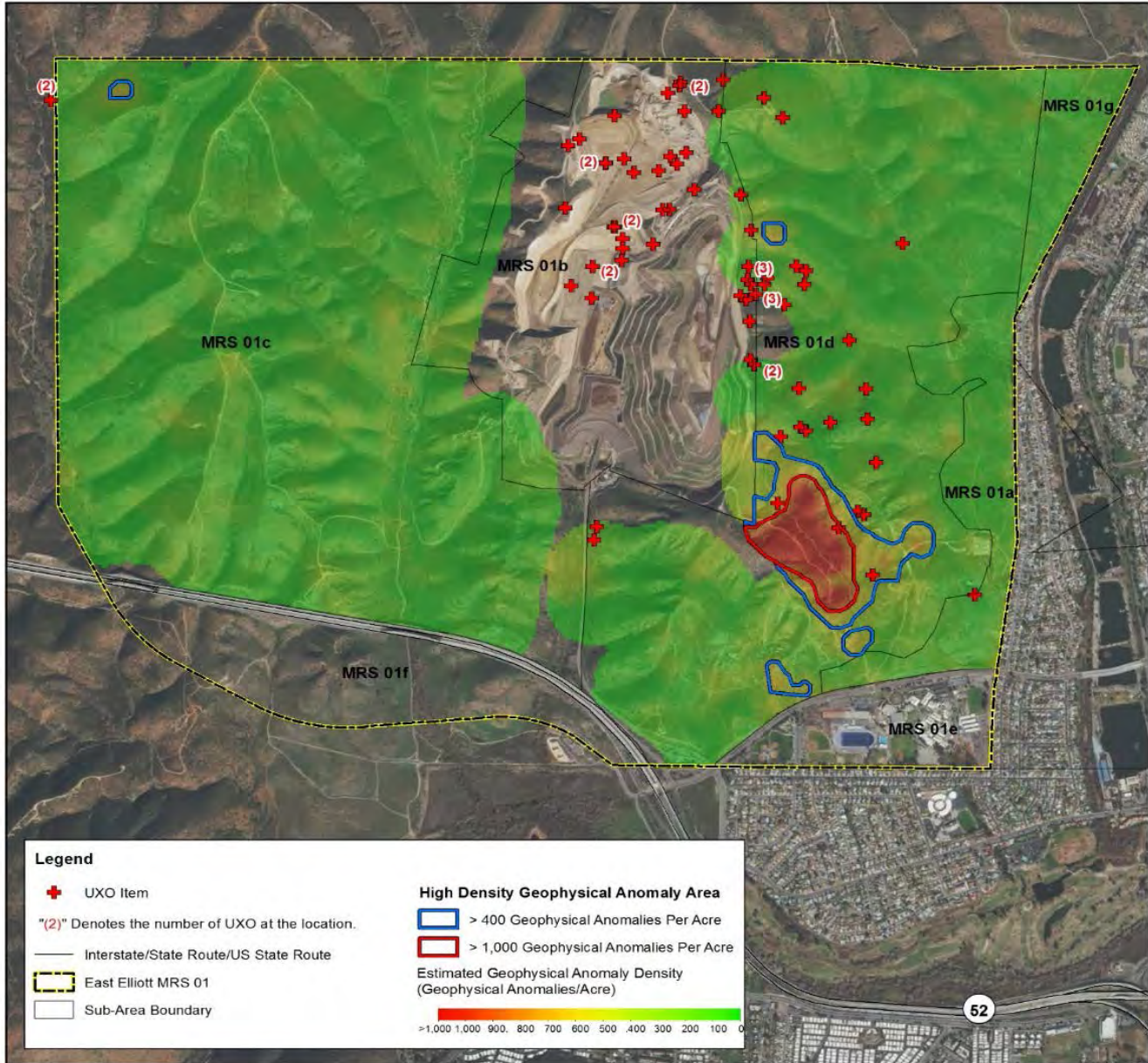
- Munitions were not encountered in **East Elliott MRS 01** during RI field operations;
- MD that resulted from the historic use of tank and artillery munitions was encountered at five locations during surface soil sampling within **East Elliott MRS 01b** and **East Elliott MRS 01d**;
- Geophysical anomaly densities were calculated for each **East Elliott MRS 01 sub-area**. Based on the available data, USACE determined that anomaly density of greater than 400 anomalies per acre may be indicative of potential impact areas. Table 4 summarizes the average and maximum anomaly densities for each **East Elliott MRS 01 sub-area**. Note anomalies are defined only as subsurface metallic materials (Ref. 3); and

| MRS Sub-area | Average Calculated Geophysical Anomaly Density | Maximum Calculated Geophysical Anomaly Density |
|-----------------------------|---|---|
| East Elliott MRS 01a | 36.7 anomalies/acre | 315 anomalies/acre |
| East Elliott MRS 01b | 34 anomalies/acre | 109 anomalies/acre |
| East Elliott MRS 01c | 21.2 anomalies/acre | 554 anomalies/acre |
| East Elliott MRS 01d | 125.2 anomalies/acre | 1,850 anomalies/acre |
| East Elliott MRS 01f | N/A | N/A |
| East Elliott MRS 01g | 16.8 anomalies/acre | 106 anomalies/acre |

- Neither MC (explosives) nor antimony were detected within **East Elliott MRS 01** or background soil samples. Additionally, metals were not identified in soil samples collected within the **East Elliott MRS 01** at concentrations that were statistically elevated relative to background levels in the MRS. Therefore, potentially complete exposure pathways for MC (metals or explosives) were not identified for surface soil, including incidental ingestion, inhalation, and dermal contact for human receptors, and ingestion and dermal contact for ecological receptors.

Figure 4 presents the results of the geophysical anomaly density analyses and historical munitions recoveries for **East Elliott MRS 01**. Note that geophysical anomaly density is not shown for **East Elliott MRS 01f** because RI field activities were not conducted in this sub-area. A complete detailed listing of the investigation results for **East Elliott MRS 01** is contained in the *RI/FS Report* (Ref. 3).

Figure 4 East Elliott MRS 01 Geophysical Anomaly Density



SUMMARY OF STAKEHOLDER AND PUBLIC INVOLVEMENT

USACE, Los Angeles District, discussed information related to the RI/FS with DTSC, local government representatives, and property owners during several technical project planning (TPP) meetings. Prior to initiating the RI fieldwork, USACE held TPP meetings in December 2011 and August 2012. During development of the *RI/FS Report*, USACE held TPP meetings in August 2014 and February 2016.

USACE also hosted a public meeting in August 2014 at the MTRP visitor center. This meeting's purpose was to allow USACE to provide the community an update on the munitions response's status and to give community members the opportunity to discuss their concerns with USACE personnel. USACE published an announcement for the meeting in the local newspaper. In addition, USACE sent postcards with details

regarding the meeting to property owners on and adjacent to **East Elliott MRS 01**. Eleven community members attended the meeting, including representatives from the City of San Diego, DTSC, the office of City Councilman Scott Sherman, Pardee Homes, Mission Trails Regional Park, Save Mission Trails Non-Profit Organization, and local residents. The main concerns expressed by the public included the schedule for completing work at **East Elliott MRS 01** and the potential hazards that may exist for people using MTRP trails and unauthorized trails on private land.

SCOPE AND ROLE OF THE RESPONSE ACTION

USACE, Los Angeles District, is developing a response or action plan to address munitions that may be present at **East Elliott MRS 01**. The scope of the response action is to address the potential explosive safety hazard posed by the potential presence of MEC at **East Elliott MRS 01**. Ultimately, the goal is to remove or reduce the probability that current or future site users would encounter munitions. The alternatives USACE is considering in this PP complement USACE's overall strategy that follows USEPA's guidance for addressing munitions at a property and allowing, from an explosives safety perspective, for the safe use of the land to continue.

SUMMARY OF POTENTIAL SITE RISKS/HAZARDS

Based on the results of the RI MC soil sampling, analytical result screening, and subsequent risk assessments, there is (a) no indication of MC (explosives) releases in **East Elliott MRS 01**; (b) no expectation of an unacceptable risk to human or ecological receptors from MC (metals). Detailed information on analytical results are provided in the *RI/FS Report* (Ref. 3).

East Elliott MRS 01 sub-areas were assessed using the USEPA MEC Hazard Assessment (MEC HA), which assess the current potential MEC hazard and how that hazard may be modified by the implementation of remedial alternatives. However, the MEC HA was not completed for **East Elliott MRS 01g** because historical data indicate that munitions were not used in this area, which indicates the exposure pathways for MEC are incomplete. The MEC HA is based on the results of the RI and the historical information available from prior studies. Detailed information regarding the MEC HA can be found in the *RI/FS Report* (Ref. 3).

The USACE FUDS MMRP Risk Management Methodology will be implemented after the completion of any potential Selected Remedy to determine the residual risk at the site.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAO) drive the formulation and development of response actions. The aim is to achieve the NCP's threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with Applicable or Relevant and Appropriate Requirements."

Because USACE did not find evidence of MC releases from historical DoD operations within **East Elliott MRS 01**, the RAOs do not address chemical contamination, including MC-related contamination. Instead, the RAOs focus on the potential explosive safety hazards associated with munitions. Unlike RAOs for most hazardous chemical contaminants, for which USEPA or state agencies have set cleanup levels based on a specified acceptable risk, regulatory guidelines have not promulgated a specific acceptable risk level associated with the presence of munitions that may pose an explosive hazard.

RAOs address specific goals for reducing the unacceptable risk due to the presence of munitions within an MRS to ensure protection of human health and the environment. Based on the data results of the RI and

previous investigations, USACE determined that munitions are not present within **East Elliott MRS 01g**; therefore, USACE did not document specific RAOs for this MRS in the FS (Ref. 3).

A factor considered in the RAOs is the anticipated depth of intrusion (digging) during activities conducted within the MRS and the depth to which munitions may be present. USACE based the depth of intrusion on the current and anticipated future land uses. The depths to which various munitions may be present, which USACE based on previous investigations, are tabulated in Table 5.

Table 5: Potential MEC Summary for East Elliott MRS 01 Sub-areas

| MRS Sub-area | Potential MEC | Description* | Rationale |
|--------------|---------------------------|--|---|
| MRS 01a | 75mm round | 75mm M48 – TNT, 1.34 pounds | Munition recovered during 1998-1999 TCRA (0 inches bgs) |
| MRS 01b | 37mm HE M63 | TNT, 0.08 pounds | Munition recovered during 2004 Sycamore Landfill Construction Support (36 inches bgs) |
| | 75mm HE M41 with M48 fuze | 75mm M41A1 – TNT, 1.11 pounds M48 PDSQ fuze with M20 Booster – Teteryl, 0.05 pounds | |
| MRS 01c | 75mm MK HE | 75mm Mk1 (Shrapnel) – Black powder, 0.19 pounds | Munition and fragments recovered during 1996 Ordnance Explosives Sampling project (1 – 10 inches bgs) |
| | 75mm APC M61 | 75mm APC M61 – Explosive D, 0.14 pounds | |
| MRS 01d | 75mm HE round | 75mm M48 – TNT, 1.34 pounds | Munition and MD recovered during 1998-1999 TCRA (12 inches bgs) |
| | 37mm HE round | 37mm M63 HE, TNT, 0.08 pounds | |
| | 81mm mortar | 81mm M57 WP – Teteryl, 0.04 pounds | |
| MRS 01f | 75mm round | 75mm M48 – TNT, 1.34 pounds | MD recovered during 2007 surface investigation (0 inches bgs) |

* Specific nomenclature regarding recovered DoD Military Munition is not available from the previous investigations; therefore, a best matched was determined from the current Fragmentation Database dated September 22, 2015 (*Final RI/FS Report*, Appendix E).

Based on historical information, previous investigations, and anticipated future land use, the below RAOs have been developed for each **East Elliott MRS 01 sub-area**. The depth for removal of DoD Military Munitions identified in each RAO is based on maximum depth at which items were previously identified and/or the anticipated depth of future intrusive activities. However, USACE will establish the actual detection threshold during development of the remedial action work plan that will be capable of 100% detection of the DoD Military Munitions known to be associated with each East Elliott MRS 01 sub-area at appropriate depth (anticipated to be between one and three feet). All DoD Military Munitions detected and/or classified at that threshold will be removed, regardless of depth.

- **East Elliott MRS 01a** – Prevent human interaction with munitions (if present) on the surface and to a depth of 36 inches bgs, which is the anticipated depth of ground disturbing or other intrusive activities (intrusion) under current and future residential activities.
- **East Elliott MRS 01b** – Prevent human interaction with munitions that may be present on the surface or in the subsurface under current and future recreational and industrial activities to a depth of 36 inches bgs.
- **East Elliott MRS 01c, MRS 01d, and MRS 01f** – Prevent human interaction with munitions that may be present on the surface or in the subsurface under current and future recreational activities to a depth of 12 inches bgs.

Regulatory guidelines have not been promulgated that specify an acceptable risk level associated with the presence of munitions that may pose an explosive hazard. To address this fact, USACE has defined acceptable risk as achieving one of the acceptable end-states described below. USACE developed these end states, which are based on current Conceptual Site Models (CSM) for each of the five sub-areas that make up **East Elliott MRS 01**, for the protection of human health and the environment. USACE considers its use of the CSM appropriate because a CSM depicts the relationship between potential site hazards, pathways for receptors to encounter hazards, and potential current and future human and ecological receptors. The acceptable end states posed below correspond to the intent of the RAOs that are presented in the approved *Final RI/FS Report*. The plan for implementing remedial actions should address the approach for minimizing disturbance to sensitive areas (e.g., culturally significant sites, habitat for T&E species, or identified T&E species), as appropriate. During this PP's development, USACE evaluated each alternative against the end states to determine if it meets the proposed RAOs.

- **Acceptable End State 1:** If a physical search for munitions is performed over 100% of the MRS, and the depth for each recovered munitions item is within the reliable detection depth ranges of the technology used for that specific munition type, then the likelihood munitions remain present is negligible. USACE anticipates that the reliable detection depth for DGM and AGC equipment for the munitions types associated with the MRS would be to a minimum of 36 inches bgs; therefore, the RAOs would be achieved for sub-areas where Alternatives 4, 5, or 6 are implemented.
- **Acceptable End State 2:** If a physical search for munitions is performed for accessible areas to the same depth as End State 1, but the horizontal munitions distribution indicates that munitions may be present within inaccessible areas (e.g., where existing slope or terrain make portions of the site unsafe for field personnel to perform remedial actions, where dense vegetation is impenetrable and prevents access to field personnel and equipment, where impact upon cultural resources or biological resources violate Applicable or Relevant and Appropriate Requirements [ARARs]), then an effort (implementation of a 3Rs Program) to modify behavior may be required. Such an effort would be intended to lower the likelihood that an encounter with a munition would result in an unintentional detonation leading to death or injury. If munitions are potentially present in areas that are inaccessible, the RAOs may only be achieved by implementing ICs (i.e., implementation of a 3Rs Program to inform users of the actions to take should they encounter a munition) for those MRS at which Alternatives 4, 5, or 6 are implemented.
- **Acceptable End State 3:** If a physical search for munitions is performed but the depth of one or more recovered munitions extends deeper than the reliable detection depth range of the technology used for that specific munition type, then an effort (implementation of a 3Rs Program) to modify behavior may be required. If munitions may be present at depths greater than the reliable detection depth of DGM or AGC equipment, RAOs may only be achieved by implementation of ICs (i.e.,

implementation of a 3Rs Program to inform users of the actions to take should they encounter a munition) for those MRS at which Alternatives 4, 5, or 6 are implemented.

- Acceptable End State 4: If a physical search is performed in lifts to a depth that would ensure that every munition would be detected to 36 inches bgs, then the likelihood a munition remains in the top 36 inches of soil is negligible. USACE anticipates the reliable detection depth for DGM and AGC equipment for the munitions types potentially present within **East Elliott MRS 01** would be to a minimum of 36 inches bgs; therefore, USACE believes the RAOs would be achieved.
- Acceptable End State 5: If previous investigations indicate that the likelihood that munitions are present is low, but MD was recovered at an MRS in a quantity or distribution that rules out a potential target area, then an effort (implementation of a 3Rs Program) to modify behavior may be required. USACE anticipates that for sub-areas in which investigations have been completed and munitions removed, the potential for an encounter with a munitions will be low; however, implementation of ICs (i.e., implementation of a 3Rs Program to inform users of the actions to take should they encounter a munition) for those MRS at which Alternative 2 is selected would be beneficial.

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Section 121(d) of CERCLA [42 USC §9621(d)] states that remedial actions on CERCLA sites must comply with or waive any ARAR, which include regulations, standards, criteria, or limitations promulgated under federal environmental, or more stringent state environmental or state facility siting laws, which are identified by a state in a timely manner. An ARAR may be either applicable or relevant and appropriate, but not both. Substantive requirements of laws and regulations may be designated as ARARs for on-site response actions, but administrative requirements (such as permits or recordkeeping) are not ARARs for on-site response actions

ARAR identification considers a number of site-specific factors, including the potential remedial action, chemicals at the site, site physical characteristics, and site location. ARARs are generally divided into three categories: chemical-specific, location-specific, and action-specific. The results of the evaluation of potential ARARs for **East Elliott MRS 01** are:

Chemical-Specific Applicable or Relevant and Appropriate Requirements

A chemical-specific ARAR has been identified for **East Elliott MRS 01**.

- **Resource Conservation and Recovery Act**, Subpart X, 40 Code of Federal Regulations (CFR) §264.601, Environmental performance standards for impacted soils. The listed document delineates environmental performance standards to be complied with during disposition of munitions-related items (e.g., blow-in-place or consolidated demolition). Consolidated demolition of munitions-related items must occur in a manner that will ensure protection of human health and the environment, as specified in this section.

Location-Specific Applicable or Relevant and Appropriate Requirements

These ARARs are triggered by the particular location and the proposed remedial activity at a site. Some of these requirements govern activities in certain environmentally sensitive areas. Location-specific ARARs for **East Elliott MRS 01** include:

- **Endangered Species Act**, 16 USC §1536(a)(2); 50 CFR §402.01(a), (prohibition on jeopardy) and 16 USC §1538(a); 50 CFR §402.14(i) (prohibition on take). The substantive requirement

under this act is to ensure that any action taken is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated critical habitat, see 16 USC §1536(a)(2); 50 CFR §402.01(a), and that no action that results in a “take” of a threatened or endangered species be undertaken without a determination that any “take” is not likely to jeopardize the continued existence of any threatened or endangered species, see 16 USC §1538(a); 50 CFR §402.14(i). Applicable because T&E species have been identified within **East Elliott MRS 01a, East Elliott MRS 01b, East Elliott MRS 01c, East Elliott MRS 01d, and East Elliott MRS 01f**, as noted in Table 3. The action must not jeopardize the continued existence of these species. (Refer to Section 2.3.1.8 in the *Final RI/FS Report* for further detail on the species present [Ref. 3]).

- ***Migratory Bird Treaty Act***, 16 USC §703(a) (prohibition on take of migratory birds). The Migratory Bird Treaty Act (MBTA) prohibits pursuit, hunting, taking, capture, or killing, or attempting the same, of migratory birds native to the United States. There have been observations of birds subject to the MBTA onsite during the breeding season of early March through mid-July. Evidence and experience shows that the detonation of recovered munitions or the clearance of vegetation, as presented in this PP, could cause take or killing of migratory birds. To comply with this ARAR, fieldwork in areas where these species are known to be present would be avoided during the bird breeding seasons of March 1 to July 15.
- ***Clean Water Act***, 33 USC §1311 and §1344. Regulates the discharge of dredged or fill material into the waters of the U.S., including wetlands. Applicable because jurisdictional waters, including ephemeral streams and wetlands, are present in **East Elliott MRS 01a, East Elliott MRS 01c, and East Elliott MRS 01d**, only. Remedial action activities, such as vegetation clearance and intrusive investigation of subsurface anomalies, could result in the discharge of materials into jurisdictional waters; therefore, the impact to streams and wetlands may need to be evaluated prior to initiating any activities.
- ***Protection of Fully-protected Bird***, California Fish and Game Code §3511. This code provides that it is unlawful to take or possess any of the fully protected birds that have been observed at **East Elliott MRS 01** including the golden eagle and the white-tailed kite. To comply with this ARAR, remedial action activities will be conducted in a manner to avoid impacting the fully-protected birds.
- ***Protection of Birds***, California Fish and Game Code §3503. This code provides that actions must be taken to avoid the take or destruction of the nest or eggs of any bird. Applicable because birds, nests, and eggs may be present throughout the entirety of **East Elliott MRS 01**. To comply with this ARAR, remedial action activities will be conducted in a manner to avoid impacting birds, their nests or their eggs.

Action-Specific Applicable or Relevant and Appropriate Requirements

No action-specific ARARs have been identified for **East Elliott MRS 01**.

SUMMARY OF REMEDIAL ALTERNATIVES

To satisfy the RAOs, USACE has developed and conducted a detailed analysis of the following seven remedial alternatives (except where noted) for **East Elliott MRS 01**. Remedial alternatives were not evaluated for **East Elliott MRS 01g**, because historical information and previous investigations indicate it is unlikely that munitions are present. Based on available information, USACE determined that CERCLA action to protect public health and the environment at **East Elliott MRS 01g** is not required.

Therefore, USACE selected Alternative 1, No Action, as the Preferred Alternative for **East Elliott MRS 01g**.

Several alternatives require the implementation of DGM, during which anomalies will be mapped using technologies that can discriminate anomalies that may be munitions from ones that are not. If the anomaly data is uncertain, the anomaly will be investigated. The use of DGM provides the highest detection performance, and provides an objective, documented audit trail of the measurements and analyses used to support remedial actions. Because site-specific conditions may vary at each **East Elliott MRS 01 sub-area**, USACE may use more than one technology during its geophysical surveys. In each case, USACE uses the best available and most appropriate technology.

Alternative 1: No Action

The No Action Alternative assumes remedial action would not be required. Under Alternative 1, response actions would not be taken; therefore, compliance with ARARs is not applicable. This alternative, which has no associated costs, does not either achieve the RAOs for the **East Elliott MRS 01** sub-areas or require time to implement.

Alternative 2: ICs to Protect Current and Future Site Users

Under this alternative, ICs would be implemented to address potential risk associated with intrusive activities (e.g., digging, construction) posed by the potential presence of munitions that may pose an explosive hazard. Alternative 2 would have no effects to cultural and environmental resources because munitions removal actions would not be taken; therefore, Alternative 2 complies with ARARs.

ICs are measures undertaken to limit the potential for the public to encounter munitions. These measures will include implementation of site-specific 3Rs Explosives Safety Education Programs (3Rs Program) (see 3Rs.mil). The 3Rs Program may include munitions awareness training and distribution of 3Rs educational material (e.g., explosive safety guides, fact sheets). Informing people of the dangers associated with munitions and the action to take should they encounter or suspect they have encountered a munition reduces the risk posed by munitions that may be present to site users. The IC Plan will identify those entities responsible for implementing and maintaining the ICs and the frequency at which the ICs would be evaluated to determine their effectiveness. Table 6 provides details regarding the implementation of this alternative within each **East Elliott MRS 01 sub-area**. USACE considered the below ICs for the **East Elliott MRS 01** sub-areas.

- **Education Awareness 3Rs (Recognize, Retreat, Report) Program:** USACE will implement a 3Rs (Recognize, Retreat, Report) Program to inform property owners and the public about both the potential hazards associated munitions that may be present within the **East Elliott MRS 01** and of the actions to take should they encounter or suspect they have encountered a munition.

USACE can facilitate and maintain public awareness about the potential hazards posed by munitions that may be present within **East Elliott MRS 01** during public outreach campaigns by identifying areas potentially containing munitions and informing them of actions to take should they encounter or suspect they have encountered a munition.

USACE would invite regulators and safety officials (e.g., DTSC, City of San Diego, and MTRP) and key stakeholders (e.g., property owners) to participate in developing ICs intended to address the **East Elliott MRS 01** as part of its implementation of the Selected Remedy.

USACE considers direct mailing of 3Rs Program educational material (e.g., fact sheets) to DTSC, MTRP, private landowners, and other local government entities; and distribution of 3Rs fact sheets in public locations (e.g., MTRP visitor center and at MTRP trailheads) to be core activities of Alternative 2. MTRP currently has signage about DoD historic use **East Elliott MRS 01**, the potential for munitions to be encountered, and emergency contact information should a munition be encountered. These signs are posted at the MTRP trailheads located in areas adjacent to **East Elliott MRS 01**.

USACE will reinforce the 3Rs Program's message to minimize the potential for an encounter with a munition to result in an unintentional detonation leading to death or injury. USACE will distribute 3Rs information packets containing printed media (e.g., brochures, posters). USACE will distribute these packages, as appropriate, by mail to stakeholders (i.e., MTRP, City of Santee, City of San Diego, and private landowners).

- **Emergency Contact Information:** USACE would develop a communications tree that provided emergency contact information for inclusion in 3Rs Program materials USACE makes available to the public.

Table 6: Implementation of Alternative 2

| MRS Sub-area | Compatible with Future Land Use (Yes/No) | Achieves RAO (Yes/No) | Time Required for Implementation | Cost |
|-------------------------------|--|--|----------------------------------|-----------|
| MRS 01a | Yes – Because previous removal activities have been conducted in the area and ground has been extensively disturbed during construction of homes without munitions being encountered | Yes – Because local community could be provided 3Rs information that would prevent individuals from interacting with munitions they may encounter | 3 years | \$157,192 |
| MRS 01b | Yes – Because access to the area is restricted and the potential for munitions to remain on site is low given completion of munitions removal actions | Yes - Because landfill operators could provide 3Rs information to employees that would prevent them from interacting with munitions | 3 years | \$157,192 |
| MRS 01c, MRS 01d, and MRS 01f | No – Because access to the area is unrestricted and there is a potential for munitions to remain within these MRS | No – Because munitions that may be present are accessible to recreational users and ensuring every users receives 3Rs Program information would be difficult | 3 years | \$157,192 |

Alternative 3: Removal of DoD Military Munitions from the Surface with ICs to Protect Current and Future Site Users

This alternative consists of using UXO-qualified personnel to investigate for the presence of munitions and remove munitions from the surface. Surface removal activities have already been completed within the sub-areas **East Elliott MRS 01a**, **East Elliott MRS 01d**, and **East Elliott MRS 01f** during previous investigations; therefore, USACE did not evaluate Alternative 3 in the FS for these MRS. Details regarding implementation of Alternative 3 are presented in Table 7.

Table 7: Implementation of Alternative 3

| MRS Sub-area | Compatible with Future Land Use (Yes/No) | Achieves RAO (Yes/No) | Time Required for Implementation | Cost |
|--------------|---|--|----------------------------------|--------------|
| MRS 01b | Yes – Because access to the area is restricted and potential for munitions to remain present is low due to previous munitions removal actions | Yes – Because surface removal of munitions in areas not previously investigated would remove the potential for munitions to be encountered and landfill operators could provide 3Rs Program educational material to employees to inform them of actions to take should they encounter a munition | 4 years | \$13,379,327 |
| MRS 01c | No – Because access to the area is unrestricted and there is a potential for munitions to remain in the sub-surface | No – Because munitions that may be present may be accessible to recreational users and intrusive activities along trails and access roads may occur | 4 years | \$3,092,104 |

Alternative 4: DGM and Surface and Subsurface Removal of DoD Military Munitions to Depth of 36 inches with ICs to Protect Current and Future Site Users (implemented for the entire MRS sub-area)

This alternative consists of land surveying to delineate remedial action boundaries, vegetation clearance, the removal of munitions from the surface (as discussed in Alternative 3), the conduct of a geophysical survey using DGM (with traditional or AGC sensors), investigation of selected anomalies, the removal of munitions from the subsurface, and the destruction of munitions determined to be MEC. The removal depth would be 36 inches bgs. This is the maximum depth to which future intrusive activities may occur. The actual depth of removal for each **East Elliott MRS 01 sub-area** is as stated in the RAO Section, above. The type of DGM sensor used during Alternative 4, which will be determined during the planning for the remedial action, will depend on the sensors' capability, and site-specific conditions. By policy, the best available and appropriate technology will be used, as such it is possible more than one technology will be used.

Although Alternative 4 could affect cultural and natural resources, its implementation could be designed to prevent an impact to resources and allow compliance with ARARs. If necessary, archaeologists and biologists would be present during activities that may be required in sensitive areas. Coordination with state and Federal agencies during the remedial action's planning stages would lay out site-specific measures to be implemented during removal activities to mitigate the impact to cultural and natural resources. These measures may include identifying areas that may need to be avoided or have restrictions placed on the amount of disturbance that may occur to facilitate the removal of munitions from the surface or subsurface. If munitions are present in areas that are inaccessible due to biological and cultural resources, USACE anticipates that RAOs would only be achieved with the implementation of ICs (Acceptable End State 2), which would focus on providing 3Rs Explosives Safety Education to educate people on the dangers associated with munitions and actions to take should they encounter or suspect they have encountered a munition. Provision of a 3Rs Program, which seeks to modify behavior, achieves the RAO for the **East Elliott MRS 01 sub-area** where this alternative is implemented.

Implementation of Alternative 4 would require trimming and mowing of vegetation to a height of 12 inches to avoid impeding or limiting either the effectiveness of the DGM equipment used during the geophysical survey or the investigation of detected anomalies and removal of subsurface munitions. Trees

with a trunk diameter of 3 inches or more will be left uncut. Upon completion of the land surveying and vegetation clearance, the removal of munitions, MD, and other metallic debris on the surface that would interfere with the DGM would be conducted. These actions will enhance the geophysical survey and the DGM's detection and discrimination capabilities. Munitions encountered during the surface removal will be evaluated and disposed of in compliance with approved procedures. MD and other metallic debris will be evaluated to determine its explosives safety status. MD documented as safe will be processed for disposition by a scrap metal recycler.

Upon completion of the surface removal, a geophysical survey using DGM will be conducted on the entire **East Elliott MRS 01 sub-area** at which Alternative 4 is implemented to detect subsurface metallic anomalies. A qualified geophysicist will analyze DGM data, which provides a permanent record of the geophysical surveying results, to identify potential targets (munitions). UXO qualified personnel will investigate selected anomalies (potential targets) to determine whether they are munitions. Munitions and other material encountered during investigation will be removed and properly dispositioned (e.g., detonated, taken to a recycling facility). Upon completion of the munitions surface and subsurface removal, ICs as outlined in Alternative 2 will be implemented. Table 8 provides details about the implementation of Alternative 4.

USACE would evaluate **East Elliott MRS 01 sub-areas** where Alternative 4 is determined to be implemented successfully (i.e., site coverage was sufficient) for determination of unlimited use/unrestricted exposure (UU/UE).

Table 8: Implementation of Alternative 4

| MRS Sub-area | Compatible with Future Land Use (Yes/No) | Achieves RAO (Yes/No) | Time Required for Implementation | Cost |
|-------------------------------|---|---|---|--|
| MRS 01a | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to reduce the probability that people would encounter munitions | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs | 4 years | \$2,506,335 |
| MRS 01b | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to reduce the probability that people would encounter munitions | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs | 4 years | \$18,612,675 |
| MRS 01c, MRS 01d, and MRS 01f | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to reduce the probability that people would encounter munitions | Yes – Because surface and subsurface munition would be removed to a depth of 36 inches bgs | 4 years | MRS 01c - \$31,651,708 MRS 01d - \$24,954,801 MRS 01f - \$11,350,014 |

Alternative 5: DGM with AGC Sensor and Surface and Subsurface Removal of DoD Military Munitions to Depth of 36 inches with ICs to Protect Current and Future Site Users

This alternative consists of land surveying to delineate remedial action boundaries, vegetation clearance, the removal of munitions from the surface (as discussed in Alternative 3), the conduct of a geophysical survey using DGM (AGC or traditional sensors), investigation of selected anomalies, the removal of munitions from the subsurface, and the destruction of munitions determined to be MEC. The removal depth would be 36 inches bgs.

Although Alternative 5 could affect cultural and natural resources, its implementation could be designed to prevent an impact to resources and allow compliance with ARARs. If necessary, archaeologists and biologists would be present during activities that may be required in sensitive areas. Coordination with state and Federal agencies during the remedial action's planning stages to lay out site-specific measures to be implemented during removal activities to mitigate the impact to cultural and natural resources. These measures may include identifying areas that may need to be avoided or have restrictions on amount of disturbance that may occur to facilitate the removal of munitions from the surface and subsurface. If munitions are present in areas that are inaccessible due to biological and cultural resources, USACE anticipates that RAOs would only be achieved with the implementation of ICs (Acceptable End State 2), which would focus on providing 3Rs Explosives Safety Education to educate people on the dangers associated with munitions and actions to take should they encounter or suspect they have encountered a munition. Provision of a 3Rs Program, which seeks to modify behavior, achieves the RAO for the **East Elliott MRS 01 sub-area** where this alternative is implemented.

Alternative 4 would require trimming and mowing of vegetation to a height of 12 inches to avoid impeding or limiting either the effectiveness of the DGM equipment used during the geophysical survey or the investigation of detected anomalies and removal of subsurface munitions. Trees with a trunk diameter of 3 inches or more will be left uncut. Upon completion of the land surveying and vegetation clearance, the removal of munitions, MD, and other metallic debris on the surface that would interfere with the DGM would be conducted. These actions will enhance the geophysical survey and the DGM's detection and discrimination capabilities. Munitions encountered during the surface removal will be evaluated and disposed of in compliance with approved procedures. MD and other metallic debris will be evaluated to determine its explosives safety status. MD documented as safe will be processed for disposition by a scrap metal recycler.

Upon completion of the surface removal, a geophysical survey using DGM will be conducted on the entire **East Elliott MRS 01 sub-area** at which Alternative 5 is implemented to detect subsurface metallic anomalies. If feasible, AGC sensors operating in dynamic mode may replace traditional DGM equipment. A qualified geophysicist will analyze DGM data, which provides a permanent record of the geophysical surveying results, to identify potential targets (munitions). UXO qualified personnel will investigate selected anomalies (potential targets) to determine whether they are munitions. Munitions and other material encountered during investigation will be removed and properly dispositioned (e.g., detonated, taken to a recycling facility). Upon completion of the munitions surface and subsurface removal, ICs as presented in Alternative 2 would be implemented. USACE would evaluate **East Elliott MRS 01 sub-areas** where the use of AGC is determined to be successful (i.e., coverage was sufficient) for determination of UU/UE.

Due to the steep terrain and dense vegetation throughout most of **East Elliott MRS 01**, the only sub-area that USACE determined safe for implementation of Alternative 5 is **East Elliott MRS 01a**. This alternative was not evaluated for other **East Elliott MRS 01 sub-areas**. Table 9 provides details about the implementation of Alternative 5 at **East Elliott MRS 01a**.

| Table 9: Implementation of Alternative 5 | | | | |
|--|---|---|----------------------------------|-------------|
| MRS Sub-area | Compatible with Future Land Use (Yes/No) | Achieves RAO (Yes/No) | Time Required for Implementation | Cost |
| MRS 01a | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to reduce the probability that people would encounter a munitions | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs | 4 years | \$1,899,471 |

Alternative 6: DGM and Surface and Subsurface Removal of DoD Military Munitions to Depth of 36 inches with ICs to Protect Current and Future Site Users (implemented for delineated response areas)

This alternative consists of the same elements as Alternative 4 including land surveying, vegetation clearance, surface removal of munitions, the conduct of a geophysical survey using DGM (with traditional or AGC sensors), and subsurface removal of munitions to a depth of 36 inches bgs. (See Alternative 4 for details of these elements.) The actual depth of removal is dependent upon the RAO for each **East Elliott MRS 01 sub-area** is as stated in the RAO Section, above. The type of DGM sensor used during Alternative 5, which will be determined during the planning for the remedial action, will depend on the sensors' capability and site-specific conditions. By policy, the best available and appropriate technology will be used, as such it is possible more than technology will be used.

This alternative would only be implemented within delineated response areas within the **East Elliott MRS 01 sub-areas** such as trails, utility trenches, and high density geophysical anomaly areas as defined in the MTRP Master Plan and the results of the RI geophysical anomaly analysis (Refs. 3 and 4). Upon completion of the surface and subsurface munitions removal, ICs as presented in Alternative 2 would be implemented. **East Elliott MRS 01a** and **East Elliott MRS 01b** do not encompass delineated response areas; therefore, this alternative is not evaluated for these **East Elliott MRS 01 sub-areas**. Table 10 provides details regarding the implementation of Alternative 6 at the delineated response areas within the **East Elliott MRS 01 sub-areas**.

Table 10: Implementation of Alternative 6

| MRS Sub-area | Compatible with Future Land Use (Yes/No) | Achieves RAO (Yes/No) | Time Required for Implementation | Cost |
|-------------------------------|---|--|----------------------------------|--|
| MRS 01c, MRS 01d, and MRS 01f | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to reduce the probability that people would encounter munitions | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs in areas where munitions are most likely be present and ICs are implemented to modify behavior | 4 years | MRS 01c - \$4,801,330 MRS 01d - \$10,647,531 MRS 01f - \$826,390 |

Alternative 7: Excavation, Sifting, Removal of DoD Military Munitions, and Munitions Debris, and Restoration

This alternative would lead to a determination of UU/UE for the project site. A UU/UE determination for an **East Elliott MRS 01 sub-area** at which it was implemented is intended to prevent restrictions being placed on the use of the land and other natural resources.

Implementation of Alternative 7 would result in a final determination that an **East Elliott MRS 01 sub-area** can be delineated as UU/UE is unlikely to be acceptable to project stakeholders for several reasons. These include: (1) lack of implementability due to complete removal of ecological receptor habitat (i.e., non-compliance with ARARs and subsequent degraded site conditions resulting from the destruction of potentially sensitive areas following the removal of surface soil and vegetation); and (2) prohibitive cost (i.e., costs for removing, sifting, re-grading the property would likely be orders of magnitude higher than less aggressive or invasive alternatives).

This alternative would entail the complete removal of vegetation prior to excavation of soils over the entirety of **East Elliott MRS 01 sub-areas** at which it is implemented. Then, soils (to the maximum depth of three feet bgs based on the detection depth observed during previous investigations) would be removed from the site and sifted. Metallic materials would be removed during the sifting process and screened for potential explosive hazards and disposed of as described in Alternatives 4. Sifted soil, from which explosive hazards have been removed would be reused at the site as backfill for excavated areas. If implemented, re-vegetation would be required to restore the area as close to original condition as possible. The excavation and restoration of site soils would be conducted in areas where (1) munitions were previously encountered that were determined to pose the greatest risk to human receptors, and (2) a very high density of MD, which could cause the cost of other alternatives to be too high.

Alternative 7 would not attain ARARs (a Threshold Criteria), as it would disturb the entirety of the MRS, including identified sensitive areas. As such, USACE does not consider it a viable alternative and did not evaluate it further in this PP. Table 11 provides details for the implementation of Alternative 11.

Table 11: Implementation of Alternative 7

| MRS Sub-area | Compatible with Future Land Use (Yes/No) | Achieves RAO (Yes/No) | Time Required for Implementation | Cost |
|-------------------------------|--|---|----------------------------------|--|
| MRS 01a | Yes – Because surface munitions would most likely be removed completely preventing receptors from encountering munitions | Yes – Because surface munitions would be removed | 6 years | \$44,321,317 |
| MRS 01b | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to prevent receptors from encountering munitions | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs | 6 years | \$51,898,959 |
| MRS 01c, MRS 01d, and MRS 01f | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs to prevent receptors from encountering munitions | Yes – Because surface and subsurface munitions would be removed to a depth of 36 inches bgs | 6 years | MRS 01c - \$98,342,699 MRS 01d - \$58,066,722 MRS 01f - \$64,431,664 |

Long-term Management

Implementation of ICs may require long-term monitoring to ensure their effectiveness. The procedures for long-term monitoring, including responsible parties and frequency, will be defined in the IC Plan developed during the IC implementation process.

Five-Year Reviews would be required for each remedial alternative, except Alternative 1, the No Action Alternative. Five-Year Reviews may not be required for **East Elliott MRS 01 sub-areas** at which Alternatives 4 and 5 are implemented, should UU/UE be obtained, or at which Alternative 7 is implemented, because it would allow for UU/UE.

Waste Associated with Alternative Selection

The only waste expected from the implementation of Alternatives 3 through 7 is scrap metal. Scrap metal would be processed as required by DoD Instruction 4140.62, Material Potentially Presenting an Explosive Hazard (MPPEH), with MDAS shipped to a local metals recycler.

EVALUATION OF ALTERNATIVES

USACE used NCP's nine required criteria to evaluate the remedial alternatives individually and against each other to select a remedy. This section of the PP presents the relative performance of each alternative against the nine criteria, noting how each alternative compares to the other options under consideration.

The nine criteria fall into three groups: threshold criteria, primary balancing criteria, and modifying criteria (Ref. 13). The purposes of these three groups are provided below.

- Threshold criteria (criteria 1 and 2 below) are requirements that each alternative must meet in order to be eligible for selection.

- Primary balancing criteria (criteria 3 through 7 below) are used to weigh major trade-offs among alternatives.
- Modifying criteria (criteria 8 and 9 below) may be considered to the extent that information is available during the FS, but can be fully considered only after public comment is received on the Proposed Plan.

The nine evaluation criteria are discussed below. The “Detailed Analysis of Alternatives” can be found in the FS (Ref. 3).

- 1. Overall Protection of Human Health and the Environment** – Considers ability to eliminate, reduce, or control threats to public health and the environment.
- 2. Compliance with Applicable or Relevant and Appropriate Requirements** – For an alternative to become eligible for selection it must meet cleanup levels or other remedial requirements identified as ARARs, or a waiver should be identified and the justification for invoking it must be provided. An alternative that cannot comply with these ARARs, or for which a waiver cannot be justified, would be eliminated from consideration for further discussions as a potential alternative in the Proposed Plan.
- 3. Long-Term Effectiveness and Permanence** – The ability to maintain protection of human health and the environment over time.
- 4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** – Use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
- 5. Short-term Effectiveness** – The length of time needed to implement an alternative and the hazards posed to residents, construction/commercial workers, visitors/recreational users, and trespassers, and the environment during implementation.
- 6. Implementability** – The technical and administrative feasibility to implement the alternative, including factors such as the relative availability of goods and services.
- 7. Cost** – Estimated cost for implementing the alternative.
- 8. State/Support Agency Acceptance** – Considers whether DTSC agrees with USACE’s analyses and recommendation based on the RI/FS and Proposed Plan.
- 9. Community Acceptance** – Considers whether the local community agrees with USACE’s analyses and preferred alternative. Public comments on the Proposed Plan are an important indicator of community acceptance.

The seven remedial alternatives developed for **East Elliott MRS 01** were evaluated and compared to the nine criteria specified above based on the following publications: United States Army Military Munitions Response Program *Munitions Response Remedial Investigation/Feasibility Study Guidance* (Ref. 12) and the USEPA *Guidance for Conducting Remedial Investigations and Feasibility Studies under Comprehensive Environmental Response, Compensation, and Liability Act* (Ref. 13).

The detailed analysis of alternatives may be thought of as proceeding in two steps: (1) a detailed evaluation of each alternative relative to the nine NCP criteria; and (2) evaluation of the remedial alternatives relative to each other, based on their ability to achieve the evaluation criteria. The *RI/FS Report* provides a detailed comparison of each alternative to the nine criteria.

During the detailed analysis, the alternatives are refined, as appropriate, and analyzed in detail with respect to the evaluation criteria. The detailed analysis of alternatives consists of the analysis and presentation of the relevant information needed to allow decision makers to select a site remedy. However, it is not the decision making process. The results of this detailed analysis of alternatives are used to compare the alternatives and identify the key tradeoffs among them. This approach to analyzing alternatives is designed to provide decision makers with sufficient information to adequately compare the alternatives, select an appropriate remedy for a site, and demonstrate satisfaction of CERCLA requirements.

The *Final RI/FS Report* provides a comprehensive analysis of the remedial alternatives for **East Elliott MRS 01** based on the alternative's ability to achieve the nine evaluation criteria specified in the United States Army and USEPA guidance documents (Refs. 12 and 13). Based on the results of the RI and previous investigations, current conditions at **East Elliott MRS 01g** already achieve Acceptable End State 1, as described above. Therefore, this MRS sub-area was recommended for "No Action" at the completion of the RI and was not analyzed in the FS.

A more detailed description of the analysis for each **East Elliott MRS 01** sub-area can be found in Section 11.2.1 (Individual Analysis) and Section 11.3.1 (Comparative Analysis) of the *Final RI/FS Report*. The comparative analysis is provided below to specifically discuss the strengths and weaknesses of the seven alternatives with regard to each other. Table 12 through Table 16 provide a summary of the comparison of alternatives relative to each other for each **East Elliott MRS 01 sub-area**. In addition, during USACE's development of this PP, USACE evaluated the alternatives relative to the acceptable end states to determine their effectiveness for achieving the RAO for each MRS.

East Elliott MRS 01a

For **East Elliott MRS 01a**, USACE evaluated the alternatives in terms of Threshold and Balancing criteria. Table 12 summarizes USACE's evaluation. USACE did not include Alternative 6 in its evaluation because it addresses only conducting removal activities in delineated areas (e.g., trails, utility trenches, and areas identified during the geophysical survey as high density anomaly areas) within the **East Elliott MRS 01a**. As such, USACE does not believe Alternative 6 relevant to **East Elliott MRS 01a**. Based on the comparative analysis, Alternatives 2 and 5 achieved equivalent ranking based on the totality of the factors, including cost and implementability (biased toward Alternative 2) and long-term effectiveness and reduction of hazards (biased toward Alternative 5). Therefore, USACE will base its final selection of the proposed alternative on consideration of the modifying factors (e.g., state and community acceptance). However, because (a) USACE already completed removal actions that removed munitions from the surface of the **East Elliott MRS 01a** sub-area; (b) only one munition (a UXO) was encountered during the RI; (c) the geophysical survey only detected a low density anomalies; and (d) **East Elliott MRS 01a** has been developed as a residential community (including extensive soil movement and grading, which was supervised by UXO personnel, and no DoD Military Munitions were recovered), USACE believes Alternative 2 may be the most acceptable alternative for **East Elliott MRS 01a**. Implementation of Alternative 2 would achieve Acceptable End State 5 for **East Elliott MRS 01a**.

East Elliott MRS 01b

For **East Elliott MRS 01b**, USACE evaluated the alternatives in terms of Threshold and Balancing criteria. Table 13 summarizes USACE's evaluation. USACE did not include Alternative 6 in its evaluation because Alternative 6 addresses only conducting removal activities in delineated areas (e.g., trails, utility trenches, and areas identified during the geophysical survey as high density anomaly areas) within **East Elliott MRS 01b**. As such, USACE does not believe Alternative 6 relevant to **East Elliott**

MRS 01b. Based on the comparative analysis, Alternatives 2 and 3 achieved equivalent ranking based on the totality of the factors, including cost and implementability (biased toward Alternative 2) and long-term effectiveness and reduction of hazards (biased toward Alternative 3). Therefore, USACE will base its final selection of the proposed alternative on consideration of the modifying factors (e.g., state and community acceptance). However, given both the low potential for munitions to be present and limited probability that users will encounter a munitions, USACE believes Alternative 2 may be the most acceptable alternative for **East Elliott MRS 01b**. Implementation of Alternative 2 would achieve Acceptable End State 5 for **East Elliott MRS 01b**.

East Elliott MRS 01c

For **East Elliott MRS 01c**, USACE evaluated the alternatives in terms of Threshold and Balancing criteria. Table 14 summarizes USACE's evaluation. USACE did not include Alternative 5 in its evaluation because it determined the use of AGC was not appropriate given the steep terrain and presence of dense vegetation. Based on the comparative analysis, Alternatives 2 and 3 achieved equivalent ranking based on a totality of the factors, including cost and implementability (biased toward Alternative 2) and long-term effectiveness and reduction of hazards (biased toward Alternative 3). Therefore, USACE will base its final selection of the proposed alternative on consideration of the modifying factors (e.g., state and community acceptance). However, because people (receptors) are able to access **East Elliott MRS 01c** along trails and roads, USACE believe Alternative 6 may be the most acceptable alternative for **East Elliott MRS 01c**. During implementation of Alternative 6, USACE would remove munitions from the surface and subsurface along trails and access roads; and from the surface and subsurface of high anomaly density areas (approximately 31.4 acres). Implementation of Alternative 6 would achieve Acceptable End State 2 for **East Elliott MRS 01c**.

East Elliott MRS 01d

For **East Elliott MRS 01d**, USACE evaluated the alternatives in terms of Threshold and Balancing criteria. Table 15 summarizes USACE's evaluation. USACE did not include Alternative 3 in its evaluation it had already completed a surface removal of munitions within **East Elliott MRS 01d**. In addition, USACE did not include Alternative 5 in its evaluation because it determined the use of AGC was not appropriate given the steep terrain and presence of dense vegetation. Based on the comparative analysis, Alternatives 2 and 6 achieved equivalent ranking based on the totality of the factors, including cost and implementability (biased toward Alternative 2) and long-term effectiveness and reduction of hazards (biased toward Alternative 6). Therefore, USACE will base its final selection of the proposed alternative on consideration of the modifying factors (e.g., state and community acceptance). However, because people (receptors) are able to access **East Elliott MRS 01d** along trails and roads and given presence of an area of high density anomalies, USACE believe Alternative 6 may be the most acceptable alternative for **East Elliott MRS 01d**. During implementation of Alternative 6, USACE would remove munitions from subsurface along trails and roads and from the subsurface of high anomaly density areas (approximately 100.4 acres). Implementation of Alternative 6 would achieve Acceptable End State 2 for **East Elliott MRS 01d**.

East Elliott MRS 01f

For **East Elliott MRS 01f**, USACE evaluated the alternatives in terms of Threshold and Balancing criteria. Table 16 summarizes USACE's evaluation. USACE did not include Alternative 3 in its evaluation because it had already completed a surface removal of munitions within **East Elliott MRS 01f**. In addition, USACE did not include Alternative 5 in its evaluation because it determined the use of AGC was not appropriate given the steep terrain and presence of dense vegetation. Based on the comparative analysis,

Alternatives 2 and 6 achieved equivalent ranking based on the totality of the factors, including cost and implementability (biased toward Alternative 2) and long-term effectiveness and reduction of hazards (biased toward Alternative 6). Therefore, USACE will base its final selection of the proposed alternative on consideration of the modifying factors (e.g., state and community acceptance). However, because people (receptors) are able to access **East Elliott MRS 01f** along trails and roads, USACE believe Alternative 6 may be the most acceptable alternative for **East Elliott MRS 01f**. During implementation of Alternative 6, USACE would remove munitions from the subsurface along trails and roads (approximately 1.96 acres). Implementation of Alternative 6 would achieve Acceptable End State 2 for **East Elliott MRS 01f**.

Table 12: EVALUATION OF REMEDIAL ALTERNATIVES
East Elliott MRS 01a

| Evaluation Criteria | Remedial Alternatives | | | | |
|--|----------------------------|---|--|---|--|
| | Alternative 1 – No Action. | Alternative 2 – ICs to Protect Current and Future Site Users. | Alternative 4 – DGM and Surface and Subsurface Removal of DoD Military Munitions to a depth of 36 inches bgs, with ICs to Protect Current and Future Site Users. | Alternative 5 – DGM with Advanced Geophysical Classification Sensor and Surface and Subsurface Removal of DoD Military Munitions to a Depth of 36 inches bgs, with ICs to Protect Current and Future Site Users | Alternative 7 – Excavation, Sifting, and Restoration |
| Overall Protection of Human Health and the Environment | □ | ■ | ■ | ■ | ■ |
| Compliance with Applicable or Relevant and Appropriate Requirements | N/A | ■ | ■ | ■ | □ |
| Long-term Effectiveness and Permanence | □ | ◆ | ▣ | ▣ | ▣ |
| Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment | □ | □ | ▣ | ▣ | ▣ |
| Short-term Effectiveness | □ | ▣ | ◆ | ◆ | ◆ |
| Implementability | ▣ | ▣ | ◆ | ◆ | □ |
| Cost* | \$0 | <u>\$157,192</u> | \$2,506,335 | \$1,899,471 | \$44,321,317 |
| State Acceptance | To Be Determined (TBD) | TBD | TBD | TBD | TBD |
| Community Acceptance | TBD | TBD | TBD | TBD | TBD |
| RAO Acceptable End State** | N/A | 5 | 1, 2*** | 1, 2*** | 1 |

Ranking: ■ Meets Criteria (Yes, regarding the first two criteria)

▣ High ability to meet criteria

◆ Moderate ability to meet the criteria

□ Does not meet criteria (No, regarding the first two criteria)

Notes: Preferred Alternative is highlighted and cost is **Bold Underline**.
 Alternative 3 is not relevant to this sub-area because USACE already completed a removal of munitions from the surface and Alternative 6 is not relevant because delineated response areas are not present.

TBD: These criteria will be further evaluated following the comment period for the Proposed Plan.

N/A: Not Applicable

* The estimated costs include costs for the remedial action and for recurring activities such as printing materials and recurring reviews (including escalation). Operations and Maintenance Costs are not associated with the proposed remedial action.

** See RAO Section for descriptions of the acceptable end states.

*** Dependent upon site conditions identified in End State 2, ICs may not be required, as determined by the post remediation data analysis.

Table 13: EVALUATION OF REMEDIAL ALTERNATIVES
East Elliott MRS 01b

| Evaluation Criteria | Remedial Alternatives | | | | |
|--|----------------------------|---|--|--|--|
| | Alternative 1 – No Action. | Alternative 2 – ICs to Protect Current and Future Site Users. | Alternative 3 – DoD Military Munitions Removal from the Surface, with ICs to Protect Current and Future Site Users | Alternative 4 – DGM and Surface and Subsurface Removal of DoD Military Munitions to a depth of 36 inches bgs, with ICs to Protect Current and Future Site Users. | Alternative 7 – Excavation, Sifting, and Restoration |
| Overall Protection of Human Health and the Environment | □ | ■ | ■ | ■ | ■ |
| Compliance with Applicable or Relevant and Appropriate Requirements | N/A | ■ | ■ | ■ | □ |
| Long-term Effectiveness and Permanence | □ | ◆ | ◆ | ▣ | ▣ |
| Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment | □ | □ | ◆ | ▣ | ▣ |
| Short-term Effectiveness | □ | ▣ | ◆ | ◆ | ◆ |
| Implementability | ▣ | ▣ | ◆ | ◆ | □ |
| Cost* | \$0 | <u>\$157,192</u> | \$13,379,327 | \$18,612,675 | \$51,898,959 |
| State Acceptance | TBD | TBD | TBD | TBD | TBD |
| Community Acceptance | TBD | TBD | TBD | TBD | TBD |
| RAO Acceptable End State** | N/A | 5 | 1, 2*** | 1, 2*** | 1 |

Ranking: ■ Meets Criteria (Yes, regarding the first two criteria)

▣ High ability to meet criteria

◆ Moderate ability to meet the criteria

□ Does not meet criteria (No, regarding the first two criteria)

Notes: Preferred Alternative is highlighted and cost is **Bold Underline**.
 Alternative 5 is not relevant to this sub-area because use of AGC would not be effective given there is steep terrain over a significant portion of the sub-area and Alternative 6 is not relevant because delineated response areas are not present.

TBD: These criteria will be further evaluated following the comment period for the Proposed Plan.

N/A: Not Applicable

* The estimated costs include costs for the remedial action and for recurring activities such as printing materials and recurring reviews (including escalation). There are no Operations and Maintenance Costs associated with the remedial action.

** See RAO Section for descriptions of the acceptable end states.

*** Dependent upon site conditions identified in End State 2, ICs may not be required, as determined by the post remediation data analysis.

Table 14: EVALUATION OF REMEDIAL ALTERNATIVES

East Elliott MRS 01c

| Evaluation Criteria | Remedial Alternatives | | | | | |
|--|----------------------------|---|---|--|---|--|
| | Alternative 1 – No Action. | Alternative 2 – ICs to Protect Current and Future Site Users. | Alternative 3 – DoD Military Munitions Removal from the Surface with ICs to Protect Current and Future Site Users | Alternative 4 – DGM and Surface and Subsurface Removal of DoD Military Munitions to a depth of 36 inches bgs, with ICs to Protect Current and Future Site Users. | Alternative 6 – DGM and Surface and Subsurface Removal of DoD Military Munitions to a Depth of 36 inches, with ICs to Protect Current and Future Site Users (Only implemented for delineated areas) | Alternative 7 – Excavation, Sifting, and Restoration |
| Overall Protection of Human Health and the Environment | □ | ■ | ■ | ■ | ■ | ■ |
| Compliance with Applicable or Relevant and Appropriate Requirements | N/A | ■ | ■ | ■ | ■ | □ |
| Long-term Effectiveness and Permanence | □ | ◆ | ◆ | □ | □ | □ |
| Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment | □ | □ | ◆ | □ | □ | □ |
| Short-term Effectiveness | □ | ■ | ◆ | ◆ | ◆ | ◆ |
| Implementability | ■ | ■ | ◆ | ◆ | ◆ | □ |
| Cost* | \$0 | \$157,192 | \$3,092,104 | \$31,651,708 | <u>\$4,801,330</u> | \$98,342,699 |
| State Acceptance | TBD | TBD | TBD | TBD | TBD | TBD |
| Community Acceptance | TBD | TBD | TBD | TBD | TBD | TBD |
| RAO Acceptable End State** | N/A | 5 | 1, 2*** | 1, 2*** | 2*** | 1 |

Ranking: ■ Meets Criteria (Yes, regarding the first two criteria)

■ High ability to meet criteria

◆ Moderate ability to meet the criteria

□ Does not meet criteria (No, regarding the first two criteria)

Notes: Preferred Alternative is highlighted and cost is **Bold Underline**. Alternative 5 is not relevant to this sub-area because use of AGC would not be effective given there is steep terrain and dense vegetation over a significant portion of the sub-area.

TBD: These criteria will be further evaluated following the comment period for the Proposed Plan.

N/A: Not Applicable

* The estimated costs include costs for the remedial action and for recurring activities such as printing materials and recurring reviews (including escalation). There are no Operations and Maintenance Costs associated with the remedial action.

** See RAO Section for descriptions of the acceptable end states.

*** Dependent upon site conditions identified in End State 2, ICs may not be required, as determined by the post remediation data analysis.

Table 15: EVALUATION OF REMEDIAL ALTERNATIVES
East Elliott MRS 01d

| Evaluation Criteria | Remedial Alternatives | | | | |
|--|----------------------------|---|--|---|--|
| | Alternative 1 – No Action. | Alternative 2 – ICs to Protect Current and Future Site Users. | Alternative 4 – DGM and Surface and Subsurface Removal of DoD Military Munitions to a depth of 36 inches bgs, with ICs to Protect Current and Future Site Users. | Alternative 6 – DGM and Surface and Subsurface Removal of DoD Military Munitions to a Depth of 36 inches, with ICs to Protect Current and Future Site Users (Only implemented for delineated areas) | Alternative 7 – Excavation, Sifting, and Restoration |
| Overall Protection of Human Health and the Environment | □ | ■ | ■ | ■ | ■ |
| Compliance with Applicable or Relevant and Appropriate Requirements | N/A | ■ | ■ | ■ | □ |
| Long-term Effectiveness and Permanence | □ | ◆ | □ | □ | □ |
| Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment | □ | □ | □ | □ | □ |
| Short-term Effectiveness | □ | □ | ◆ | ◆ | ◆ |
| Implementability | ■ | □ | ◆ | ◆ | □ |
| Cost* | \$0 | \$157,192 | \$24,954,801 | <u>\$10,647,531</u> | \$58,066,722 |
| State Acceptance | TBD | TBD | TBD | TBD | TBD |
| Community Acceptance | TBD | TBD | TBD | TBD | TBD |
| RAO Acceptable End State** | N/A | 5 | 1, 2*** | 2*** | 1 |

Ranking: ■ Meets Criteria (Yes, regarding the first two criteria)

□ High ability to meet criteria

◆ Moderate ability to meet the criteria

□ Does not meet criteria (No, regarding the first two criteria)

Notes: Preferred Alternative is highlighted and cost is **Bold Underline**.
 Alternative 3 is relevant to this sub-USACE already completed a removal of munitions from the surface and Alternative 5 is not relevant because use of AGC would not be effective given there is steep terrain and dense vegetation over a significant portion of the sub-area.

TBD: These criteria will be further evaluated following the comment period for the Proposed Plan.

N/A: Not Applicable

* The estimated costs include costs for the remedial action and for recurring activities such as printing materials and recurring reviews (including escalation). There are no Operations and Maintenance Costs associated with the remedial action.

** See RAO Section for descriptions of the acceptable end states.

*** Dependent upon site conditions identified in End State #2, ICs may not be required, as determined by the post remediation data analysis.

Table 16: EVALUATION OF REMEDIAL ALTERNATIVES
East Elliott MRS 01f

| Evaluation Criteria | Remedial Alternatives | | | | |
|--|----------------------------|---|---|---|--|
| | Alternative 1 – No Action. | Alternative 2 – ICs to Protect Current and Future Site Users. | Alternative 4 – DGM and Surface/Subsurface Removal of DoD Military Munitions (to a Depth of 36 inches bgs) with ICs to Protect Current and Future Site Users. | Alternative 6 – DGM and Surface/Subsurface Removal of DoD Military Munitions (to a Depth of 36 inches bgs) with ICs to Protect Current and Future Site Users (implemented for delineated response area) | Alternative 7 – Excavation, Sifting, and Restoration |
| Overall Protection of Human Health and the Environment | □ | ■ | ■ | ■ | ■ |
| Compliance with Applicable or Relevant and Appropriate Requirements | N/A | ■ | ■ | ■ | □ |
| Long-term Effectiveness and Permanence | □ | ◆ | ■ | ■ | ■ |
| Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment | □ | □ | ■ | ■ | ■ |
| Short-term Effectiveness | □ | ■ | ◆ | ◆ | ◆ |
| Implementability | ■ | ■ | ◆ | ◆ | □ |
| Cost* | \$0 | \$157,192 | \$11,350,014 | <u>\$826,390</u> | \$64,431,664 |
| State Acceptance | TBD | TBD | TBD | TBD | TBD |
| Community Acceptance | TBD | TBD | TBD | TBD | TBD |
| RAO Acceptable End State** | N/A | 5 | 1, 2*** | 2*** | 1 |

Ranking: ■ Meets Criteria (Yes, regarding the first two criteria)

■ High ability to meet criteria

◆ Moderate ability to meet the criteria

□ Does not meet criteria (No, regarding the first two criteria)

Notes: Preferred Alternative is highlighted and cost is **Bold Underline**. Alternative 3 is relevant to this sub-area because USACE already completed a removal of munitions from the surface and Alternative 5 is not relevant because use of AGC would not be effective given there is steep terrain and dense vegetation over a significant portion of the sub-area.

TBD: These criteria will be further evaluated following the comment period for the Proposed Plan.

N/A: Not Applicable

* The estimated costs include costs for the remedial action and for recurring activities such as printing materials and recurring reviews (including escalation). There are no Operations and Maintenance Costs associated with the remedial action.

** See RAO Section (pgs. 25) for descriptions of the acceptable end states.

*** Dependent upon site conditions identified in End State #2, ICs may not be required, as determined by the post remediation data analysis.

SUMMARY OF PREFERRED ALTERNATIVE

Based on a detailed analysis of each alternative and the evaluation comparing the alternatives, USACE's believes the highlighted alternatives presented in Table 12 through Table 16 above for each **East Elliott MRS 01 sub-area** are the Preferred Alternatives. A Preferred Alternative is considered necessary to protect public health, welfare and the environment from actual or threatened releases of hazardous substances into the environment. For the **East Elliott MRS 01** munitions are potentially present within the MRS.

East Elliott MRS 01a

Table 12 summarizes USACE's comparative analysis of the alternatives for **East Elliott MRS 01a**. Based on the evaluation of alternatives, USACE selected Alternative 2 as the Preferred Alternative for **East Elliott MRS 01a**. Implementation of Alternative 2 would achieve the RAO for **East Elliott MRS 01a** by providing the community a 3Rs Program to inform them of the actions to take should they encounter or suspect they have encountered a munition. Implementation of Alternative 2 would achieve Acceptable End State 5.

East Elliott MRS 01b

Table 13 summarizes USACE's comparative analysis of the alternatives for **East Elliott MRS 01b**. Based on the evaluation of alternatives, USACE selected Alternative 2 as the Preferred Alternative for **East Elliott MRS 01b**. Implementation of Alternative 2 would achieve the RAO for **East Elliott MRS 01b** by implementing a 3Rs Program to inform the community of the actions to take should they encounter or suspect they have encountered a munition. Implementation of Alternative 2 would achieve Acceptable End State 5.

East Elliott MRS 01c

Table 14 summarizes USACE's comparative analysis of the alternatives for **East Elliott MRS 01c**. Based on the evaluation of alternatives, USACE selected Alternative 6 as the Preferred Alternative for **East Elliott MRS 01c**. Implementation of Alternative 6 would achieve the RAO for **East Elliott MRS 01c** by reducing the probability that users would encounter munitions and implementing a 3Rs Program to inform the community of the actions to take should they encounter or suspect they have encountered a munition. Implementation of Alternative 6 achieve Acceptable End State 2.

East Elliott MRS 01d

Table 15 summarizes USACE's comparative analysis of the alternatives for **East Elliott MRS 01d**. Based on the evaluation of alternatives, USACE selected Alternative 6 as the Preferred Alternative for **East Elliott MRS 01d**. Implementation of Alternative 6 would achieve the RAO for **East Elliott MRS 01d** reducing the probability that users would encounter munitions and implementing a 3Rs Program to inform the community of the actions to take should they encounter or suspect they have encountered a munitions. Implementation of Alternative 6 would achieve Acceptable End State 2.

East Elliott MRS 01f

Table 16 summarizes USACE's comparative analysis of the alternatives for **East Elliott MRS 01f**. Based on the evaluation of alternatives, USACE selected Alternative 6 as the Preferred Alternative for **East Elliott MRS 01f**. Implementation of Alternative 6 would achieve the RAO for **East Elliott MRS 01f**. Implementation of Alternative 6 would achieve the RAO for **East Elliott MRS 01f** reducing the

probability that users would encounter munitions and implementing a 3Rs Program to inform the community of the actions to take should they encounter or suspect they have encountered a munitions. Implementation of Alternative 6 would achieve Acceptable End State 2.

East Elliott MRS 01g

Based on the results of the RI and previous investigations, current conditions at **East Elliott MRS 01g** already achieve Acceptable End State 1. Therefore, USACE selected Alternative 1 as the Preferred Alternative for **East Elliott MRS 01g**.

Based on information currently available, USACE believes the Preferred Alternatives proposed for **East Elliott MRS 01 sub-areas** meet both the threshold criteria and provide the best balance of tradeoffs with respect to the balancing and modifying criteria. The proposed Preferred Alternatives (Selected Remedies) provide the greatest reduction of risk within the constraints imposed by the environmental conditions at a reasonable cost when compared to the other options. USACE expects the Preferred Alternatives to fulfill the following statutory and regulatory requirements of Section 121(b) of CERCLA: (1) be protective of human health and the environment, (2) comply with ARARs (unless justified by a waiver), (3) be cost-effective when evaluated against the nine criteria described in the NCP, and (4) provide a permanent remedial solution to the maximum extent practicable. Treatment of recovered munitions that qualified personnel determine are MEC as a principle element of a Preferred Alternative is applicable to sub-areas (**East Elliott MRS 01c**, **East Elliott MRS 01d**, and **East Elliott MRS 01f**) in which the exposure pathway for receptors to encounter munition that may be present is complete. In other sub-areas (**East Elliott MRS 01a** and **East Elliott MRS 01b**) where either the potential for munitions to be present is low or the exposure pathways for receptors to encounter a munition is considered unlikely to be complete, alternatives that do not include treatment (i.e., implementation of ICs) are considered appropriate.

The state regulatory agency, DTSC, concurs that the selection of the proposed Preferred Alternatives, as presented above, are appropriate and provide the best balance of tradeoffs.

COMMUNITY PARTICIPATION

USACE provides information regarding the remedial alternatives for the **East Elliott MRS 01 sub-areas** to the public through public meetings, the Administrative Record file for the site, and announcements published in the San Diego Union/Tribune and/or the East County Gazette (local newspapers). USACE encourages the public to gain a more comprehensive understanding of the site and the remedial activities that have been conducted at the site.

Public input is a key element in the CERCLA process. The local community is encouraged to comment on this Proposed Plan and the Preferred Alternatives summarized herein. Comments from the public will be used to help determine what action to take. Members of the public may communicate verbally or in writing at the public meeting on **June 20, 2018**. Representatives from USACE and DTSC will be present at the meeting to explain the Proposed Plan, hear concerns, and answer questions.

Members of the public may comment in writing during the public comment period (**June 18, 2018 to July 20, 2018**).

Correspondence should be sent to:

Mr. Randy Tabije
US Army Corps of Engineers
Los Angeles District
2493 Pomona-Rincon Road
Corona, CA 92880
Email: Roland.R.Tabije@usace.army.mil

If special correspondence or public meeting accommodations are needed, please call **(951) 898-6144**.

After considering public comments, USACE will select the final remedies. The Preferred Alternatives may be modified based on public comment or new information. The final chosen remedies will be described in the Decision Document phase (the next step after this Proposed Plan). USACE will respond to comments from the public in a responsiveness summary, which will be part of the Decision Document and will be available for review in the Administrative Record file.

REFERENCES

1. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 11 December 1980, 42 United States Code (USC) 9601-9675, Public Law (PL) 96-510, as amended by the Superfund Amendment and Reauthorization Act (SARA). 17 October 1986.
2. National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300.
3. USACE. 2018. Final Remedial Investigation/Feasibility Study Report, Former Camp Elliott, East Elliott – San Diego County, California. FUDS MMRP Project Number – J09CA006703. Contract No. W912PL-10-D-0005, Task Order 0006. Prepared Bristol Environmental Remediation, LLC. February.
4. MTRP. 2016. Public Revised Draft 2016 Mission Trails Regional Park Master Plan Update. Available online at <http://www.ktuaprojects.com/mtrp/mtrpdoclist.html>.
5. USACE. 1995. Former Camp Elliott (East Elliott) Engineering Evaluation/Cost Analysis (EE/CA) Final Archives Search Report, San Diego, California. Prepared by Montgomery Watson. March.
6. USACE. 2013. Final Remedial Investigation Work Plan, Former Camp Elliott, East Elliott Project, San Diego, California, FUDS MMRP Project J09CA006703. Prepared by Accord Engineering, Inc. January.
7. USACE. 1999. Formerly-Used Defense Site Camp Elliott (East Elliott), Final Engineering Evaluation/Cost Analysis (EE/CA). Prepared by Montgomery Watson. August.
8. USACE. 2004. Final Archives Search Report, Camp Elliott, San Diego, CA, Project Number – J09CA006704. 30 September.
9. USACE. 1994. Draft Final Report, Surface/Subsurface OEW Sampling, East Elliott, Former Camp Elliott, California. Prepared by UXB International Inc. June.
10. USACE. 1999. Final Report, Ordnance and Explosives (OE) Removal Action, East Elliott, San Diego, California. Completed by Human Factors Applications, Inc. 17 December.
11. USACE. 2006. Munitions Constituents Sampling, Analysis, and Evaluation of Formerly Used Defense Sites (FUDS), Former Camp Elliott (East Elliott). Prepared by Parsons. 4 August.
12. U.S. Army. 2009. Military Munitions Response Program – Munitions Response – Remedial Investigation/Feasibility Study Guidance. November.
13. USEPA. 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. EPA/540/G-89/004, OSWER Directive 9355.3-01. October.
14. USACE. 2008. Site Specific Draft Final Report, Munitions and Explosives of Concern (MEC) Surface Removal Action at Former Camp Elliott – Mission Trails, Mission Trails Regional Park, San Diego, California. Prepared by Project Resources, Inc. March.

GLOSSARY OF TERMS

Administrative Record - The official collection of documents related to investigation and cleanup activities at East Elliot MRS 01 considered, or relied on, in selecting the response action supporting the Decision Document for remedial action at East Elliot MRS 01.

Anomaly - An anomaly is any item that is identified as a subsurface irregularity during geophysical investigation. This irregularity deviates from the expected subsurface ferrous and nonferrous material at a site (pipes, power lines, etc.).

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 - This Act authorizes federal action to respond to the release or potential release of hazardous substances into the environment or a release or threat of release of a pollutant or contaminant into the environment that may present an imminent or substantial danger to public health or welfare.

Decision Document - The documentation of remedial response decisions at Formerly Used Defense Sites. Concurrence on the Decision Document by U.S. Environmental Protection Agency or the state regulatory agency is sought and the Army approves the document.

Formerly Used Defense Sites - A facility or site that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances. By the Department of Defense Environmental Restoration Program (DERP) policy, the FUDS program is limited to those real properties that were transferred from DoD control prior to 17 October 1986.

Institutional Control - Institutional Controls means Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (i) limit land, water and/or resource use to minimize the potential for human exposure to waste materials at the site; (ii) limit land, water and/or resource use to implement, ensure non-interference with, or ensure the protectiveness of the Remedial Action; and/or (iii) provide information intended to modify or guide human behavior at the site.

Munitions and Explosives of Concern - This term, which distinguishes specific categories of military munitions that may potentially pose unique explosive safety hazards, includes Unexploded Ordnance, as defined in 10 USC 101(e)(5); Discarded Military Munitions, as defined in 10 USC 2710(e)(2); or Munitions Constituents (for example, TNT, RDX), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Constituents - Munitions Constituents include any material originating from Unexploded Ordnance, Discarded Military Munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris - Remnants of munitions (for example, 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 UXO, DMM, or MC, or to support a determination that no removal or remedial action is required.

Military Munitions Response Program - designed to address the remediation of unexploded ordnance, discarded military munitions, and munitions constituents located on defense sites.

Munitions Response Area (MRA) - Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.

Munitions Response Site - A discrete location within a Munitions Response Area that is known to require a munitions response.

Preferred Alternative - The alternative that USACE feels is the best way to address past military impacts to a site.

Proposed Plan - The Preferred Remedial Alternative for a site is presented to the public in a Proposed Plan. The Proposed Plan briefly summarizes the remedial alternatives studied in the detailed analysis phase of the Remedial Investigation/Feasibility Study, highlighting the key factors that led to identifying the Preferred Alternative. The Proposed Plan, as well as the Remedial Investigation/Feasibility Study and the other information that forms the basis for the lead agency's response selection, is made available for public comment in the Administrative Record file.

Remedial Investigation/Feasibility Study - A Remedial Investigation is performed to collect data to characterize site conditions, delineate the nature and extent of contamination (in this case Materials and Explosives of Concern) and assess potential risk/hazard to human health and the environment. The Feasibility Study is the evaluation process for the development, screening, and detailing alternatives for remedial actions.

Removal Action - A removal action is the cleanup or removal of released hazardous substances from the environment or the taking of such other actions, as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from any exposure to hazardous substances. The term includes, without being limited to, security fencing or other measures to limit access and provide post-removal site control, where appropriate.

Unexploded Ordnance - Military munitions that: (a) have been primed, fuzed, armed, or otherwise prepared for action; (b) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (c) remain unexploded either by malfunction, design, or any other cause (USC §2710 (e)(9)).



Remember the 3Rs of Military Munitions Safety:

- **Recognize:**
you may have encountered a munitions item.
- **Retreat:**
from the munitions item. Do not touch or disturb it; instead move away carefully, walking out the same way you entered the area. Do not use two-way radios or cell phones within 100 feet of the items.
- **Report:**
what you saw and where you saw it by calling 911.

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USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for **East Elliott MRS 01** is important to United States Army Corps of Engineers. Comments provided by the public are valuable in helping United States Army Corps of Engineers select final remedial alternatives for the site.

You may use the space below to write your comments, then fold and mail. Comments must be postmarked by **July 20, 2018**. If you have any questions about the comment period, please contact Mr. Randy Tabije by phone at (951) 898-6144 or by email at roland.r.tabije@usace.army.mil.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Name: _____

Address: _____

City: _____

State: _____ **Zip:** _____

-----fold-----

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PLACE STAMP
HERE
The Post Office
will not deliver
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Mr. Randy Tabije
United States Army Corps of Engineers
Los Angeles District
2493 Pomona-Rincon Road
Corona, CA 92880