

SITE OE-27Y

TRAINING SITE 25

## CONTENTS

SITE OE-27Y (TRAINING SITE 25) .....	3.27Y-1
3.27Y Site OE-27Y (Training Site 25) .....	3.27Y-1
3.27Y.1 Site Description .....	3.27Y-1
3.27Y.2 Site History and Development .....	3.27Y-1
3.27Y.3 Potential Ordnance based on Historical Use of the Area.....	3.27Y-4
3.27Y.4 History of OE Investigations .....	3.27Y-4
3.27Y.5 Conceptual Site Model.....	3.27Y-5
3.27Y.5.1 Training Practices .....	3.27Y-5
3.27Y.5.2 Site Features.....	3.27Y-6
3.27Y.5.3 Potential Sources and Location of OE.....	3.27Y-6
3.27Y.5.4 Potential Exposure Routes .....	3.27Y-7
3.27Y.6 Site Evaluation .....	3.27Y-8
3.27Y.6.1 Literature Review.....	3.27Y-8
3.27Y.6.2 Sampling Review.....	3.27Y-9
3.27Y.7 Conclusions and Recommendations .....	3.27Y-13
3.27Y.8 References .....	3.27Y-15

## TABLES

- 27Y-1 Sampling Operations, Site OE-27Y and Vicinity
- 27Y-2 OE Scrap Found During Sampling, Site OE-27Y

## PLATES

- 27Y-1 Site OE-27Y Location Map – Former Fort Ord
- 27Y-2 Site OE-27Y, 1956 Aerial Photograph
- 27Y-3 Site OE-27Y, 1978 Aerial Photograph
- 27Y-4 Site OE-27Y, 1999 Aerial Photograph
- 27Y-5 Conceptual Site Model, Site OE-27Y

## ATTACHMENT

- 27Y – A1 Evaluation of Previous Work Checklists
- 27Y – A2 Potential Ordnance Used at Site OE-27Y

## SITE OE-27Y (TRAINING SITE 25)

### 3.27Y Site OE-27Y (Training Site 25)

This summary report consists of two parts. The first part, contained in Sections 3.27Y.1 through 3.27Y.5, includes a presentation and assessment of archival data. Specific elements include a review of site history and development, evaluation of potential ordnance at the site, a summary of previous ordnance and explosives (OE) investigations, and a conceptual site model. The above-mentioned information was used to support the second part of this report, which is the Site Evaluation (Section 3.27Y.6). The Site Evaluation was conducted in accordance with the procedures described in the *Final Plan for Evaluation of Previous Work (Harding Lawson Associates [HLA], 2000)* and may restate some information presented previously. The Site Evaluation discusses the evaluation of the literature review process (Section 3.27Y.6.1), and evaluation of the sampling process(es) (Section 3.27Y.6.2). These discussions are based upon information from standardized literature review and reconnaissance review checklists (Attachment 27Y-A1). Section 3.27Y.7 provides conclusions and recommendations for the site. References are provided in Section 3.27Y.8.

#### 3.27Y.1 Site Description

Site OE-27Y is approximately 25 acres and is located in the eastern portion of Fort Ord, along Inter-Garrison Road (Plate 27Y-1). Site OE-27Y was identified through a review of Fort Ord historic records completed for the Fort Ord Archive Search Report (ASR; *U.S. Army Engineer Division, Huntsville, [USAEDH], 1997*). Site OE-27Y was one of 26 training sites (TS) established within the Fort Ord Training and Maneuver Areas. The training sites were used as overnight bivouac areas (*U.S. Army [Army], 1980*).

#### 3.27Y.2 Site History and Development

The following presents a summary of the site history and development that is based on archival research and review of historical training maps and aerial photographs. Plates have been prepared that present pertinent features digitized from historical training maps and scanned aerial photographs reviewed by Harding ESE. It should be noted that minor discrepancies between source maps, combined with the natural degradation of older source maps and photographs, has resulted in misalignment of some map features. In addition, camera angle and lens distortion introduced into older aerial photographs, combined with changes in vegetation and site features over time may contribute to the misalignment of some map features with respect to the aerial photographs.

##### *Pre-1940s*

The eastern half of the site lies within a tract of land purchased from private landowners by the government in 1917 (Plate 27Y-1), the western half of the site lies on land purchased by the government after July 1940 (*Arthur D. Little, Inc. [ADL], 1994*). Documentation of pre-1940s era use of this area is limited to topographic maps from 1918 (U.S. Geologic Survey, 1918) and 1933 (*Army, 1933-34*). No specific training areas were identified on these maps.

### 1940s Era

Review of 1940s aerial photographs and training maps indicates no training areas or facilities present in this area. The following details the review of historical documents:

- On the 1941 and 1949 aerial photographs, there is a small unvegetated area on the southeast corner of the site boundary. Its use if any, is unknown.
- A 1945 Training and Facilities map shows no specific training areas or facilities within the site area. The site lies within the larger “E-North” general training area (*Army, 1945*).

### 1950s Era

Review of 1950s Fort Ord training maps indicates that part of the site overlaps an area identified as a “Demonstration Area” and “MG 1 & 2” (Plate 27Y-2). The following identifies specific details of historical review:

- On the 1956 training map, the northern half of the site area is identified as “Demonstration Area.” The site is also within the general training area of the 10th Infantry (*Army, 1956*).
- The 1956 aerial photograph shows the same small unvegetated area in the southeastern corner of the site.
- The 1958 training map shows “MG 1 & 2” on the border area between Sites OE-27Y and OE-66. According to Army Field Manual FM 21-30, MG stands for Machine Gun (*Army, 1951*). The 1957 and 1958 training maps show the site area within the 1<sup>st</sup> Brigade’s general training area (*Army, 1957 and 1958*). The mission of the 1<sup>st</sup> Brigade was to conduct basic combat training (*Army, 1968*).

### 1960s Era

Review of 1960s Fort Ord training maps indicates that the area was used for aviation training and as a Basic Unit Training (BUT) Composite ST (possibly “Service Test”) Area (*Army, 1985*). The site area is within a larger training area assigned to the 1<sup>st</sup> Brigade and the 4<sup>th</sup> Brigade as shown on the 1960s training maps. The mission of the 4<sup>th</sup> Brigade was to conduct combat support training, including basic unit supply, field communications, radio operations, and light vehicle driving (*Army, 1968*). The results of the review of the 1960s era documentation are as follows:

- On the 1964 map, an “Aviation Training Area” is indicated east of the site vicinity. A “BUT Composite ST Area” is present within the site (*Army, 1964*). The site lies on the eastern side of an area identified as the “Field Communication Crewman Course.” According to the Fort Ord Range control officer present at Fort Ord from 1970 through 1990, training at the aviation training areas included helicopters landing and taking off as part of a practice emergency evacuation scenario and did not involve the use of OE (*Stickler, 2003*). Field Communication Crewman areas were used for Signal Corps training and included practicing the layout of communication wires (*Robbotti, 2001*).
- The 1967 map shows a helipad on the east side of the site area and a “Wireman Course” to the west (*Army, 1967*). Helipads were used for the purpose of emergency evacuations (*Army, 1980*).

- On the 1968 map, an aviation training area is present in the location where the helipad was shown in 1967. The “BUT Composite ST Area” still exists and building “T-3973” is identified on the site area. The Wireman Course still exists to the west (*U.S. Army Corps of Engineers [USACE], 1968*).

### 1970s Era

The site area was first identified as Training Site 25 (TS-25) in the 1970’s. The results of the review of 1970s era documentation are as follows:

- On the 1972 map, the helipad and Wireman Course are still present within the site area (*USACE, 1972*).
- The 1976 and 1977 maps show building T-3973 and helipad on the site area (*USACE, 1976 and 1977*). A 1976 map also identifies a “FWC FTX Area” north of Site OE-27Y (*Army, 1976*). FWC may stand for Field Wire Command or Course and FTX may stand for Field Training Exercise (*Army, 1985*).
- The 1978 Ranges and Training Area Overlay map identifies the vicinity as Training Site 25 (TS-25) (*Army, 1978*).
- On the 1978 aerial photograph, the same small unvegetated area is present on the southeastern corner of the site boundary (Plate 27Y-3).

### 1980s Era

The Site OE-27Y area continued to be identified as Training Site 25 (TS-25) in the 1980s. TS-25 included a Medevac helipad, latrine, and communication terminal (*Army, 1980*). Review of training maps indicates that activity for Training Site 25 ended sometime in the mid 1980s. Housing construction was completed west and north of the site boundaries by 1989.

- The site area is identified as “TS-25” on the 1980 and 1984 Training Facilities Maps (*USACE, 1980 and 1984*). Also, Building “T-3973” is identified within the site area.
- No training site is identified in the area on the 1987 Ranges and Training Area map (*Army, 1987*).
- Schoonover Housing was constructed between 1987 and 1990 (*ATC Environmental Inc. [ATC], 1994*).
- An aerial photograph from 1988 shows that the construction of the Schoonover Housing area to the west and north of the site had not begun. Aerial photographs from 1992 and 1999 (Plate 27Y-4) show the completed housing north and west of the Site OE-27Y boundary.

### Proposed Future Land Use

A small portion of Site OE-27Y lies on property that was transferred to California State University Monterey Bay (CSUMB) in 1995. Current and future use of the CSUMB property is development. The remainder and majority of the site lies on property that is designated as habitat reserve (*USACE, 1997*).

### 3.27Y.3 Potential Ordnance Based on Historical Use of the Area

This site was used for various troop training activities including field communications, aviation, basic unit training, and a bivouac area. No evidence has been found to indicate it was used for training with explosive ordnance or as an impact area. Site OE-66, which borders Site OE-27Y on the north side, was reportedly used as a signal corps field training area (*USAEDH, 1997*). The firing of blank small arms ammunition was reported to have occurred at Site OE-66. Information gathered indicates that blank small arms ammunition were used and pyrotechnics may have been used at Site OE-27Y.

### 3.27Y.4 History of OE Investigations

The following describes the OE investigations that have been conducted at Site OE-27Y.

#### *1994 Archives Search Report (ASR) Supplement*

The purpose of the archives search conducted at Fort Ord was to gather and review historical information to determine the types of munitions used at the site, identify possible disposal areas, identify unknown training areas and recommend follow-up actions. Guidance for conducting archive searches did not exist prior to 1995. The 1994 Archives Search Report (ASR) Supplement was completed based on the scope of work provided to the St. Louis Corps of Engineers by the Huntsville Corps of Engineers and an archive search reports completed at other military installations. The archives search included a Preliminary Assessment/Site Investigation (PA/SI) consisting of interviews with individuals familiar with the sites, visits to previously established sites, reconnaissance of newly identified training areas, and the review of data collected during sampling or removal actions. Requirements for preparation of an ASR are described in Section 2.0 of this report.

Site OE-27Y was not identified in the 1993 ASR, but was one of 25 training sites identified in a 1994 supplement to the ASR. The ASR Supplement identified 25 training sites at Fort Ord from a 1984 training facilities map (*USAEDH, 1994*). One of the 25 training sites, TS-17 (Site OE-27Q) was chosen at random to survey for the presence of OE. Blank casings, grenade safety levers, and a grenade fuze (OE scrap) were identified during the survey of that site. Based on this review, further investigation was recommended for each of the 25 training sites (including OE-27Y) identified during the archives search process.

#### *Human Factors Applications, Inc. (HFA) Investigation*

In 1994, HFA completed sampling of four grids within and in the vicinity of Site OE-27Y (*HFA, 1994*). The HFA sampling methodology is discussed in Section 3.27Y.6.2. The four 100- by 100-foot grids were 100 percent sampled (all anomalies detected were investigated) using either the Schonstedt Models GA-52/C or GA-72/Cv magnetometer using a maximum 5-foot wide search lane. Although the sampling was not specific to Site OE-27Y, one of the four sample grids was located within the boundary of Site OE-27Y (Plate 27Y-4). The remaining three grids were located adjacent to Site OE-27Y. No OE or OE scrap was found during the HFA grid sampling (*HFA, 1994*).

The scope of work for HFA indicated that detailed accounting of all OE items/components/scrap encountered would be performed. However, grid records providing this information are no longer available. The only information regarding items found is summarized in the text of the HFA OE Sampling and OE Removal Report (*HFA, 1994*). The report itemized OE scrap found and removed. Some non-OE scrap was also removed and turned in at the end of the project. Contract requirements for the scope of work performed by HFA are described in more detail in Section 2.0 of this report.

## *UXB International Investigation*

Sampling of Site OE-27Y was conducted in 1995 by UXB International, Inc. (UXB) using site boundaries provided by the USACE Huntsville Division. The UXB sampling methodology is discussed in Section 3.27Y.6.2. Site OE-27Y was subdivided into eighteen 50- by 1,700-foot search lanes and 25 percent of each lane was selected at random for sampling (382,500 square feet). Within the portion of the lane sampled, all anomalies detected were investigated to a depth of 4 feet using the Schonstedt Model GA-52/Cx magnetometer. One OE scrap item, an expended illumination signal (M125 Series) and sixty-five live small arms blanks were found and removed during the lane sampling. No information regarding the depth at which the signal was found was provided in the UXB after action report. Information regarding the specific location of where the item was found within the lane was not documented by UXB. The location of the item found is to the sample lane only. No evidence was found to support the use of the area as an impact area (e.g., fragmentation, fuzes, or projectile s). On the basis of the sampling results, no further OE response was recommended in the Site OE-27Y OE after action report (*UXB, 1995b*). A summary of the sampling operations conducted at Site OE-27Y and vicinity is provided in Table 27Y-1. Contract requirements for the scope of work performed by UXB are discussed in greater detail in Section 2.0 of this report.

### *1997 Revised Archives Search Report*

Additional information was compiled for Site OE-27Y through additional review of Fort Ord historic records as described in the Revised Archives Search Report (*USAEDH, 1997*) and review of the data collected during sampling conducted by UXB in 1995. Based on the results of sampling (no OE found), no further action was recommended at Site OE-27Y in the revised ASR (*USAEDH, 1997*). The revised archives search was conducted in accordance with U.S. Army Corps of Engineers guidance (*USAECH, 1995*).

## 3.27Y.5 Conceptual Site Model

Conceptual site models (CSMs) are generally developed during the preliminary site characterization phase of work to provide a basis for the sampling design and identification of potential release (functioning of the OE item; e.g., detonation) and exposure routes. CSMs usually incorporate information regarding the physical features and limits of the area of concern (the site), nature and source of the contamination (in this case OE), and exposure routes (potential scenarios that may result in contact with OE).

The CSM for Site OE-27Y is based on currently available site-specific and general information including literature reviews, sampling results, aerial photographs, maps, technical manuals, field observations, and the information shown on Plate 27Y-5. It is provided to help evaluate the adequacy of the investigation completed to date and to identify potential release and exposure pathways. Site OE-27Y included a Medevac helipad, latrine, and communication terminal.

### 3.27Y.5.1 Training Practices

Training practices are discussed below to provide information on the types of OE that may have been used at the site and the possible location of OE potentially remaining at the site.

### *Bivouac Area*

Bivouac areas at Fort Ord were used for overnight training and field exercise. Twenty-six bivouac areas had been established by 1980 and are documented in Fort Ord Regulation 350-5 (*Army, 1980*).

According to Fort Ord regulations in place during the time that Site OE-27Y was active, use of bivouac areas was closely monitored. The storage of ammunition was not allowed within 100 feet of a bivouac area. Normally, only blank cartridges, simulators, pyrotechnics, and smoke items were allowed to be stored near bivouac areas. However, field storage of sensitive items, demolition materials and small arms ammunition (other than blank) were permitted if clearance was obtained from the division ammunition officer (*Army, 1980*). Ammunition holding areas were to be individually fenced with triple concertina wire or comparable fencing. Depending on the quantity of ammunition stored, an armed guard may have been required to maintain access control. According to Fort Ord Regulation 350-5 “Strict accountability will be maintained so that items cannot be buried or discarded to avoid returning unspent ammunition.” To discourage the burial or discarding of unspent ammunition, ammunition was inventoried when checked out from the Ammo Supply Point (ASP), daily while stored in the field, and again upon turn in of the unused ammunition at the ASP.

Fort Ord range regulations required that units be checked into and out of all bivouac areas. Joint inspections of the bivouac areas were conducted by the unit representative and a representative of Range Control prior to releasing the bivouac area from unit responsibility. All tactical digging or holes were to be filled in and all wire removed. All garbage (wet or dry) was to be hauled to the sanitary landfill for disposal or placed within dumpsters in the Main Garrison if the landfill was closed.

Although it is unlikely (for the reasons stated above) that unspent ammunition authorized for use in the bivouac areas would have been buried at Site OE-27Y, the possibility that burial did occur does exist. If the burial of spent ammunition occurred at Site OE-27Y, these items would not present a hazard if encountered.

### *Aviation Training Area*

According to the Fort Ord Range Control officer present at Fort Ord from 1970 through 1990, training at the aviation training areas included helicopters landing and taking off as part of a practice emergency evacuation scenario (*Stickler, 2003*). He also stated that the use of OE was not a part of this training. The former Range Control officer also noted that Range Control was responsible for the scheduling and the inspection of these training areas prior to checkout of the unit using the area. No conceptual site model is provided for this training activity because the use of OE at this training area is not expected.

#### 3.27Y.5.2 Site Features

Site OE-27Y lies on the eastern side of Fort Ord on the north side of Inter-Garrison Road (Plate 27Y-1). The site is relatively flat with moderate to heavy vegetation surrounding the developed areas (housing). The site was used for troop training including field communications, aviation training, and as an overnight bivouac area by 1978 (*Army, 1978*).

#### 3.27Y.5.3 Potential Sources and Location of OE

Based on review of site data, the type of OE that might be expected at this site would be pyrotechnics, including smoke-producing and illumination items. An expended (OE scrap) pyrotechnic signal (M125 series) was found during sampling at Site OE-27Y. The M125 series star cluster pyrotechnic handheld signals are used primarily as a communication signal, but can also be used for illuminating small

areas for short periods. Other handheld star cluster signals include Models M158 and M159 (*Army, 2000*). The signals by design are non-penetrating and if still present would be located at or near the ground surface. There is a remote possibility that OE may have been buried at Site OE-27Y. Although unlikely, if this activity occurred the items buried would be located within 3 feet of the ground surface.

### 3.27Y.5.4 Potential Exposure Routes

The site is located immediately on the north side of Inter-Garrison Road, to the south of the Schoonover Housing area. A small portion of this site is within land transferred to CSUMB and is accessible to residents of the Schoonover Housing area. The remainder of Site OE-27Y will be maintained as habitat reserve. To date, no instances of OE items being found by the public in this area have been reported. The results of the literature review and sampling do not indicate that direct fire or high trajectory weapons (e.g., shoulder fired or mortars) were used at this site. In addition, no evidence was found to support the use of adjacent Site OE-66 as an impact area (e.g., fragmentation) during site sampling, and during a site reconnaissance (*USAEDH, 1997*).

Because no OE was discovered during site sampling or reported previously, OE is not expected in this area. Any OE found during housing construction would have been removed prior to occupation of the housing. However, because the site was not 100 percent investigated and OE scrap was found during sampling the possibility exists that a recreational user could come into contact with surface OE such as illumination signals.

Although no OE items were found at Site OE-27Y a brief discussion of the potential injuries that could result from contact with live illumination signals is provided below. This item was selected for discussion, because a scrap M125 Series illumination signal was found during site sampling.

For each of the OE items potentially remaining at the site, the following discussions provide information on: (1) how the item was designed to function, (2) the likelihood the item would function if found onsite and handled, and (3) the type of injury the item could cause if it functions. Additional information on these items is provided in Attachment 27Y-A2.

#### **Signals, Illumination, Ground, Clusters: Green Star, M125A1; Red Star, M158; White Star, M159.**

These signals were designed for daytime and nighttime signaling. Star cluster signals consist of 5-star illuminant assemblies and a rocket motor propulsion assembly combined in a hand-held aluminum launching tube. The base of the launching tube contains a primer and an initiating charge. As shipped, the firing pin cap is assembled to the forward end and must be reversed for firing. Stabilizing fins on the tail assembly of the rocket are folded parallel to the axis of the signal. A bolt, which also transfers the initiating charge flash to the propellant, extends into the center of the solid propellant, which fills the propulsion assembly. The illuminant assembly is mounted on top of the propulsion assembly with a delay assembly and an expelling charge between. It was functioned by striking the primer with the firing pin, which ignites the initiating charge to ignite the rocket propellant. As the rocket emerges from the tube, the fins unfold for flight stability. Before rocket motor burnout, at 200 feet, the black powder expelling charge is ignited performing a two-fold purpose of expelling and igniting the 5-star illuminant assemblies. Burn time is 6 to 10 seconds with burnout occurring at 250 to 300 feet above the ground (*Army, 1977*). It is unlikely that incidental contact could cause a signal to function as the cap must be removed, placed over the base and struck sharply. If caused to function, the type of injury that could be sustained would be burns from the initiating charge and possibly the rocket motor.

**Summary:** It is unlikely that a person could cause a signal to function through casual contact if one were found at the site and be burned, because it: (1) would require precise placement of components and a hard

blow to function, and (2) would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

### 3.27Y.6 Site Evaluation

The available data (e.g., archival and reconnaissance data) regarding Site OE-27Y were reviewed and evaluated according to procedures described in the *Final Plan for Evaluation of Previous Work (HLA, 2000)*. The evaluation process is documented through the completion of a series of checklists. Copies of the checklist are provided as Attachment 27Y-A1. This section presents a summary of the results of the checklist evaluation. It is divided into two sections, an assessment of the literature review and an assessment of the sampling performed at the site.

#### 3.27Y.6.1 Literature Review

##### *Type of Training and OE Expected*

This area was used for training since the mid 1940s (*Army, 1945*). In the 1950s, training in this area included a Demonstration Area and Machine Gun 1 & 2. The specific use of the “Demonstration Area” is unknown. Ranges for live machine gun fire were present in various locations within the Multi-Range Area (MRA) from the 1940s through base closure. A Basic Unit Training Composite ST Area was shown in a 1964 training map. The area was assigned to the 1<sup>st</sup> Brigade, which conducted basic combat training (*Army, 1968*). In the 1960s and 1970s, aviation training areas and helipads were present in this area. OE-27Y is identified as Training Site 25 in the 1980 and 1984 Training Facilities Maps. Training Sites were used as overnight bivouac areas (*Army, 1980*). It is possible that pyrotechnic items (illumination flares and smoke signals) and blank small arms ammunition could have been used during training. No evidence exists to indicate that this site was used as an impact area. Housing was constructed adjacent to the site between 1988 and 1989. In November 1997, a USACE UXO Safety Specialist walked a portion of adjacent Site OE-66 using a magnetometer. No hazardous items were located, only expended blank small arms ammunition, expended smoke grenade, and signals were found (*USAEDH, 1997*). Additional information on these items is provided in Attachment 27Y-A2.

##### *Subsequent Use of the Area*

The majority of the site remains undeveloped and is to be maintained as habitat reserve. Housing located north and west of Site OE-27Y was constructed between 1988 and 1989 and has been transferred to CSUMB. Any OE found during housing construction would have been removed.

##### *Establishment of Site Boundaries*

Review of historical aerial photographs and training maps indicates a portion of that TS-25 is within the site boundaries established in the ASR. TS-25 boundaries defined on the USACE 1980 and 1984 training maps are similar to the combined Site OE-27Y and Site OE-66 boundaries that are presented in the ASR. Aerial photographs show many dirt roads and several small disturbed areas, but there is no clear indication of a defined training area. No structures or permanent features are shown within site boundaries on the aerial photographs, although a building (possibly a latrine) is noted within TS-25 on facilities maps. Army training maps from 1978 to 1982 do not delineate a boundary for TS-25, but do provide an approximate location for TS-25 in the same area as is presented on USACE facility maps. According to the USACE, the training site footprints depicted on training facilities maps were assumed to be approximations of the limits of the training areas and were used as the basis for the ASR investigation. The training site boundaries were modified to their current configurations (1997 ASR) based on interview

notes, aerial photograph review, and input from the OE Safety Specialist and the OE contractor (HLA, 1999). No additional information was found as a result of the literature review to warrant changes to the current boundary of Site OE-27Y.

### *Summary of Literature Review Analysis*

This area has been used for various training activities since the 1940s including a demonstration area, signal corps training, and a bivouac area. No evidence was found during the literature review to indicate that this area was used for anything other than a troop training and maneuver area which may have included the use of blank small arms ammunition and pyrotechnics. This area was assigned to the 1<sup>st</sup> Brigade and the 4<sup>th</sup> Brigade from the late 1950s until the early 1970s. The mission of the 1<sup>st</sup> Brigade was to conduct basic combat training and the mission of the 4<sup>th</sup> Brigade included various combat support activities such as basic unit supply, field communications, radio operations, and light vehicle driving. The review of historical aerial photographs and training maps indicates that a portion of TS-25 is included within the existing Site OE-27Y boundary presented in the ASR. A site walk of adjacent Site OE-66 indicates that pyrotechnic items were used there. Based on the literature review, no further OE-related investigation is warranted at Site OE-27Y.

#### 3.27Y.6.2 Sampling Review

This section describes the results of the sampling conducted at the site relative to the interpretation of the site history and boundary. A discussion of the equipment, sampling methods, and the quality control measures used during the investigation is also presented in this section.

#### *Sampling Results (Items Found)*

Sampling of Site OE-27Y was conducted in 1995 by UXB. One OE scrap item (expended illumination signal) and sixty-five live small arms blanks (eight .30-caliber and fifty-seven 7.62mm) blanks were found and removed during the grid sampling (UXB, 1995b). The OE scrap item found was a hand-held Model M125 series ground signal used for daytime or nighttime signaling (Army, 1977). No evidence of high explosives was found during sampling. A summary of the Site OE-27Y sampling results is provided in Table 27Y-2.

In 1994, HFA completed sampling of four grids within and in the vicinity of Site OE-27Y (HFA, 1994). Although the sampling was not specific to Site OE-27Y, one of the four sample grids was located within the boundary of Site OE-27Y. The remaining three grids were located adjacent to Site OE-27Y. No OE or OE scrap was found during the HFA grid sampling (HFA, 1994).

There was no evidence found during sampling to suggest that this site was used as an impact area. Based on the results of the sampling conducted at Site OE-27Y and the site walk conducted at adjacent Site OE-66, pyrotechnic items may have been utilized during training activities in this area.

#### *Site Boundaries Review*

The site boundary was provided by the U.S. Army Corps of Engineers, Huntsville Division and documented in the ASR (USAEDH, 1997). A review of the sampling results indicates that blank small arms ammunition was found scattered throughout the site, typical of other training sites at Fort Ord. The results of the sampling of Site OE-27Y do not indicate that modification to the site boundaries is necessary.

## Equipment Review

UXB used the Schonstedt Model GA-52/Cx magnetometer to conduct the geophysical investigation of adjacent Site OE-27Y. HFA used the Schonstedt Models GA-52/C or the GA-72/Cv magnetometers to conduct the geophysical investigation of the grids adjacent to Site OE-66. These magnetometers are hand held and swung from side to side, generating a maximum search lane width of 5 feet. The Schonstedt instruments are passive dual flux-gate magnetometers -- highly sensitive magnetic locators that detect ferrous (iron) metal objects; however, they cannot detect non-ferrous metal objects (e.g., lead, brass, copper, aluminum). Magnetometers make passive measurements of the earth's natural magnetic field; ferrous metal objects (and rocks) are detected because they produce localized distortions (anomalies) in the magnetic field. The Schonstedt magnetometers actually detect slight differences in the magnetic field (the "gradient") by means of two sensors mounted a fixed distance apart within the instruments' staff. Because the magnetic response falls off (changes) greatly even over a short distance, gradient magnetometers like the Schonstedt GA-52/C, GA-52/Cx, and the GA-72/Cv are especially sensitive to smaller, near-surface ferro-metal objects (*Breiner, 1973*).

The performance of the GA-52/C, GA-52/Cx and the GA-72/Cv was evaluated as part of the Ordnance Detection and Discrimination Study (ODDS, *Parsons Infrastructure & Technology Group, Inc. [Parsons, 2001]*). As part of the ODDS, studies were performed to evaluate:

- Signatures of inert OE items suspended in air at varying orientations and distances from the geophysical sensor (static tests).
- The ability of various geophysical instruments to detect and discriminate between different OE items buried at various depths (seeded tests).
- Geophysical instrument performance at actual OE sites (field trial site testing).

The Schonstedt tools were not evaluated during static tests; therefore, only the seeded test results and the field trial sites tests are discussed herein. It is recognized that the ODDS study areas may not represent the same field conditions as are present at Site OE-27Y; therefore, differences in field conditions, if applicable, should be considered when using information from the ODDS.

The results of the seeded test found that between 56 and 59 percent, 63 and 78 percent, and 67 and 78 percent of the Type I surface items (illumination flares) were detected by the Schonstedt Model GA-52/C, GA-72/Cv and GA-52/Cx, respectively buried at depths ranging from just below the surface to 1 foot. The detection rate percentages presented in the ODDS vary according to the search radius used for the analysis (either 1.6 or 3.3 feet) and assume a 5-foot wide search lane. Both HFA and UXB used a 5-foot wide search lane when investigating Site OE-27Y. A standard search radius for investigating anomalies was not specified in the OE contractor work plan or the after action reports; therefore the detection ranges for the different search radii are presented above. Results for the 3-foot wide search lane, also evaluated as part of the ODDS, were not included in the detection percentages presented above, because 3-foot search lanes were not used during the geophysical investigation of Site 27Y. The detection rates are considered conservative because in addition to the calculated penetration depth of the item (illumination signal surface), 1 foot was added to the depth to allow for the deposition of soil with time. Because the field conditions at the seeded test site and orientations of buried items may not be comparable to the Site OE-27Y conditions, the results should be used to indicate that, in general, the equipment is capable of detecting the same types of items between 0 and 1 foot below ground surface. Additionally, unless obscured by vegetation, it is expected that the detection of ordnance items lying on the ground surface should be 100 percent.

Results of the ODDS Field Trial Sites (FTS) were also reviewed for potential use in evaluating instrument performance at Sites OE-66 and OE-27Y. Detection rates for each of the Schonstedt magnetometers were calculated for 4 of the 6 test sites; the remaining sites did not have enough OE items detected to allow calculation of site statistics. The calculated detection rates for the combined sites ranged from 52 to 96 percent for the GA-52/C, 97 to 100 percent for the GA-52/Cx, and 64 to 98 percent for the GA-72/Cv, depending on the search radius used for the calculation. A standard search radius for investigating anomalies was not specified in the OE contractor work plan or the after action reports; therefore detection ranges for the different search radii (1.6 and 3.3 feet) are presented above. It should be noted that the ODDS field trial sites were selected to represent areas with high ordnance density. In comparison, Track 1 sites are expected to have very low densities of OE scrap. Therefore, the field trial results may not be applicable to Track 1 sites.

Results of the ODDS FTS for the site closest in OE item density to Site OE-27Y (FTS-3) were also reviewed. Five OE scrap items were located at FTS-3. No additional OE items were found during sifting of 10 percent of each grid (final Quality Control [QC] sampling). This indicates that it is unlikely that OE items would remain at FTS-3 within the grids sampled. Similar results could be expected at other sites, such as OE-27Y, after survey and clearance using the Schonstedt magnetometers.

Although not directly comparable to Site OE-27Y, the results of the ODDS indicate that all models of the Schonstedts used at this site are capable of detecting the ferrous surface and subsurface OE expected at this site. Small arms ammunition is non-ferrous and cannot be detected with a magnetometer.

### *Sampling Methods Discussion*

#### HFA Field Sampling

Four 100- by 100-foot grids were set up in and around Site OE-27Y as part of the 1994 HFA sampling program. A maximum search lane width of 5 feet was used during sampling. Three grids were set up adjacent to Site OE-27Y (west of) and one grid was placed within the site boundary. These grids were 100 percent sampled which required that 100 percent of the anomalies detected in the sampling grids were excavated. According to the HFA work plan, each grid was given a 100 percent visual surface survey. A 100 percent subsurface survey, using the Schonstedt Model GA/52C magnetometer was performed simultaneously. If surface items were found, their locations were plotted on a map and the items removed. Subsurface contacts and anomalies were flagged for excavation and identification and were later excavated using hand tools (*HFA, 1993*). The general approach to the investigation of anomalies was to dig down to the anomaly, remove it, and check the excavation with the Schonstedt. If the anomaly was no longer detected, no further digging was performed. If the Schonstedt continued to detect an anomaly, the area was excavated to at least 4 feet below ground surface (bgs). Field records for the HFA sampling are not available, therefore the number of anomalies detected and excavated, the depths of excavations, and the types of non-OE scrap items located are not available.

#### UXB Field Sampling

At the direction of the U.S. Army Corps of Engineers Huntsville Division (CEHND) Safety Specialist, UXB subdivided Site OE-27Y into eighteen 50- by 1700-foot search lanes (382,500 square feet) and 25 percent of each lane was selected at random for sampling. Each search lane was investigated visually while simultaneously searching for subsurface anomalies with the magnetometer. The sampling method used was 100 percent grid sampling, all magnetic anomalies detected were marked (flagged) and excavated using hand tools to a depth of 4 feet by the UXO Safety Specialist (*UXB, 1995*). If the

anomaly could not be uncovered within 4 feet of the surface the on-site CEHND Safety Specialist was asked to determine if deeper excavation was required.

### *Quality Assurance/Quality Control*

The Quality Assurance/Quality Control (QA/QC) procedures are described below.

#### *HFA Field Sampling*

Quality Assurance (QA)/QC performed by HFA throughout the field sampling effort is documented in the after action report (*HFA, 1994*). According to the report, the project was completed without QC discrepancy. It was not possible to perform a check of the reported results and field grid sampling documentation because they were not available.

Little specific information concerning operational procedures was documented in the HFA After Action Report. The following describes field procedures specified in the work plan and the after action report when documented. According to the HFA work plan, equipment was inspected by the Senior UXO Supervisor (SUXOS) and QC/Site Safety Officer (QC/SS) prior to placing it in service (*HFA, 1993*). Magnetometers were inspected and tested daily on a buried piece of inert ordnance to ensure that the magnetometers were operating within specification. The test source, a solid steel 81mm mortar (inert ordnance item) was buried at a depth of 4 feet. The magnetometers were tested before starting sampling operations in the morning and when operations resumed after lunch (*HFA, 1994*). Magnetometers that failed the inspection and test were determined to be in need of repair, and were to be removed immediately from service. Random checks were to be performed by the QC/SS and/or the SUXOS during daily operations. The QC/SS was to inspect all records bi-weekly to ensure that they were kept and maintained (*HFA, 1993*).

After surface and subsurface clearance of each site and prior to removal of grid markers, the QC/SS performed the standard minimum 10 percent QC check of each grid (*HFA, 1994*). If OE was discovered during the QC check, the entire grid was to be searched again to ensure that there was no other anomalies present. All grids were to be left in place until the CEHND Safety Specialist completed a 10 percent QA check of the previously checked grids. QC reports that included descriptions and results of the QC checks were to be completed daily.

According to the after action report, the project was completed without QC discrepancy. It was not possible to perform a check of the reported results and the field-generated grid sampling documentation because they were not available.

#### *UXB Field Sampling*

UXB conducted sampling at Site OE-27Y from December 21, 1994 through January 5, 1995. QA/QC was performed throughout field sampling and is documented in the Site OE-27Y Final After Action Report and the Final Primary Report (*UXB, 1995a and 1995b*). According to the reports, to insure that OE sampling was done properly, QC checks were performed by UXB QC specialists on each lane. QC checks were performed on 10 percent of each lane after all OE operations were complete. Sample lanes were required to cover at least 10 percent of the total area of the site to be sampled. Following completion of the QC check, the CEHND Safety Specialist conducted a QA check. The QA check included a 10 percent check of the site (search lanes), using a Mark 26 Forester Magnetometer, prior to accepting it.

Magnetometers were inspected and tested daily to ensure that the magnetometers were operating within specification. A seeded test area was established by burying an inert (OE scrap) item (81mm mortar) at a depth of 4 feet. On December 20, 1994 two additional inert OE items (2.36-inch rocket and 105mm projectile) were also buried at a depth of 4 feet at the seeded test area. This area was used by teams to check their magnetometer and by the QC officer to randomly QC teams on their procedures (*UXB, 1995a*).

### *Data Management*

Parsons, the current OE contractor, performed a 100 percent QC review of the data associated with the site. This review followed guidelines presented in the Standard Operating Procedures (SOP) provided as Appendix A. This evaluation included a review of field grid records (if available) and the database created by the OE contractor. The USACE followed the QC review with a 10 percent QA of the Parsons' data review. The requirements of the QA review are described in the USACE SOP provided as Appendix B in this report. The purpose of the QC/QA review was to complete a 100 percent check of all available grid records to identify discrepancies between the after action reports and the grid records. Discrepancies were then researched and corrections made, if appropriate, prior to loading the data into the project database. No discrepancies between the after action reports and the grid records were identified for this site.

For this site the following conclusions can be made regarding the quality of the data:

### *HFA Sampling*

- The data collected by HFA were useful in identifying areas where OE is not likely present based on areas sampled
- There appears to be poor survey control for the grid locations.

### *UXB Sampling*

- The sample data collected by UXB are useful in providing information concerning the type of items present and in identifying areas where OE is not likely at Site OE-27Y. Following sampling of the search lanes, UXB performed QC checks on at least 10 percent of each of the search lanes. Following completion of the QC, the CEHND Safety Specialist conducted a 10 percent QA inspection
- QC of the data indicates that the specific location of the expended illumination signal was not documented resulting in a location accuracy that is limited to the search lane where it was found
- Depth information was not recorded by UXB
- No discrepancies between the after action report and the grid records were identified.

## 3.27Y.7 Conclusions and Recommendations

The following section presents conclusions and recommendations for this site based on the review and analysis of data associated with historical information and sampling performed at the site.

### *Site Use and Development*

- Based on a review of training maps, aerial photographs, and conducting site sampling, Site OE-27Y appears to have been used as a troop training, maneuver, and bivouac area. Other training activities that occurred in this area in past years included field communications training, aviation training, and basic unit training. These activities began in the 1950s and continued until housing construction occurred in the vicinity in 1989. Sampling of this site resulted in the discovery of blank small arms ammunition and one expended illumination signal (OE scrap). No evidence was found to support the use of high explosive ordnance.
- The majority of the site is within land will be transferred to the BLM and is to be maintained as habitat reserve. A portion of the property within the site has been transferred to CSUMB and is categorized as development property. Although some property within the site boundary has been transferred, none of the adjacent transferred housing lies within the boundary of the site.

### *Sampling Adequacy and Data Quality*

- The Schonstedt Models GA-52/Cx and GA-52/C or GA-72/Cv were used for the geophysical investigation of Site OE-27Y. These instruments were evaluated as part of the ODDS and with the exception of small arms ammunition (which is predominately lead and brass), are capable of detecting the type of OE items expected at this site. A numerical value for detection of items cannot be calculated for an individual site.
- Sampling and evaluation of previous work followed published work plans and SOPs.
- The data collected by HFA are useful because, although the sampling was not performed to investigate Site OE-27Y, the data indicate that no OE items were found in the grid sampled within Site OE-27Y or the three grids sampled adjacent to Site OE-27Y. No OE items were found; therefore absence of depth, location, and accurate grid location information is not considered a data gap that significantly affects the interpretation of this site.
- The data collected by UXB are useful in providing information concerning the type of items present at Site OE-27Y. The presence of the expended illumination signal and blank ammunition is consistent with the types of items authorized for use in a bivouac area. The specific location of where the expended illumination signal was found was not provided so the accuracy of the location of the item found is limited to the search lane where it was found. Additionally, the depth at which the items were found was not recorded. However, all anomalies were excavated up to a depth of 4 feet.
- No burial pits were discovered during sampling. The sampling results, along with the strict rules prohibiting burials (described earlier) support the assertion that burial of OE items was not likely within a bivouac area.
- Based on historical use of the site and materials found at the site, it is unlikely OE is present at the site. However, the following OE items, if present at the site, are considered to pose an acceptable risk if encountered for the following reasons.

**Signals, Illumination, Ground, Clusters: Green Star, M125A1; Red Star, M158; White Star, M159.** It is unlikely that a person could cause a signal to function through casual contact if one were found at the site and be burned, because it: (1) would require precise placement of components and a

hard blow to function, and (2) would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

- Although the previous OE sampling efforts performed at Site OE-27Y are not consistent with requirements in place today, the quantity and quality of the available information is sufficient to make an informed decision regarding the site. The entire site was not sampled, however, the sampling methods were sufficient to confirm the types of OE items used. Additionally, because there was no OE found in previous investigations and the OE items potentially remaining at Site OE-27Y pose an acceptable risk if encountered, further effort to refine the site boundaries or conduct 100 percent sampling of the site would not add significantly to the understanding of the site or change the conclusions of this report.

### *Recommendations*

Based on the review of existing data:

- It is not anticipated that OE will be found at Site OE-27Y and no further OE-related investigation is recommended. However, because OE were used throughout the history of Fort Ord and because OE scrap was found during sampling, the potential for OE to remain at Site OE-27Y cannot be ruled out.
- This site qualifies as a Track 1, Category 3 site because it was used for training. OE items that potentially remain pose an acceptable risk based on site-specific evaluations conducted in the RI/FS.

Upon approval of the proposed remedy (no further OE-related investigation), Site OE-27Y will be incorporated into the basewide OE RI/FS 5-year review schedule. The purpose of the 5-year review is to determine whether the remedy at Site OE-27Y continues to be protective of human health and the environment. The 5-year review will also document any newly identified site-related data or issues identified during the review, and will identify recommendations to address them as appropriate.

### 3.27Y.8 References

Arthur D. Little, Inc. (ADL), 1994. *Final Community Environmental Response Facilitation Act (CERFA) Report, Fort Ord, Monterey, California. Real Estate Fort Ord (Military Reservation)*. April.

ATC Environmental Inc. (ATC), 1994. *Asbestos Survey Report for U.S. Army Corps of Engineers. Preston & Schoonover Parks, Fort Ord Installation, Fort Ord, California*. October 28.

Breiner, 1973. *Applications Manual For Portable Magnetometers*.

HLA, 1999. Conference Call with USACE St. Louis, USACE Sacramento, and MACTEC. March 18.

Harding Lawson Associates (HLA), 2000. *Final Plan for Evaluation of Previous Work Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. December 4.

\_\_\_\_\_, 1999. *Final Enhanced Preliminary Assessment of Monterey Bay, Fort Ord, California*. January 12.

\_\_\_\_\_, 1994. *OEW Sampling and OEW Removal Action, Ft. Ord Final Report*. December 1.

Human Factors Applications, Inc. (HFA), 1993. *Ordnance and Explosive Waste (OEW) Site Operations, Fort Ord – Phase I Work Plan and Accident Prevention Plan*. December.

- Infrastructure & Technology Group, Inc. (Parsons), 2001. *Draft Final Ordnance Detection and Discrimination Study (ODDS), Former Fort Ord, Monterey, California*. December.
- Robbotti, J., 2001. Telephone Interview with Bruce Wilcer, Harding ESE. April 24.
- Stickler, L., 2003. Telephone interview with Jeff Fenton, Mary Jo Heassler and Bruce Wilcer, MACTEC. April.
- U.S. Army (Army), 1933-34. *Camp Ord and Vicinity, Terrain Map. Prepared under the direction of the Chief of Engineers*.
- \_\_\_\_\_, 1945. *Training Facilities, Fort Ord and Vicinity, California*. Revised August 1945.
- \_\_\_\_\_, 1951. *Military Symbols, Army Field Manual FM 21-30 and Air Force Manual AFM 55-3*. June.
- \_\_\_\_\_, 1956. *Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "O"*. Revised: 20 December 1956.
- \_\_\_\_\_, 1957. *Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "H"*. Revised: 15 July 1957.
- \_\_\_\_\_, 1958. *Map of Fort Ord Training Areas & Facilities. Enclosure I to Appendix 1 to Annex "H"*. Revised: 10 January 1958.
- \_\_\_\_\_, 1964. *Field Training Areas & Range Map, Fort Ord. Appendix 2, Annex O*. April 27, 1964.
- \_\_\_\_\_, 1967. *Back Country Roads, Fort Ord, California. Field Training Area and Range Map*. January.
- \_\_\_\_\_, 1968. *U.S. Army Training Center Infantry, Company D, 4<sup>th</sup> Battalion, 1<sup>st</sup> Brigade*. June.
- \_\_\_\_\_, 1976. *Ranges and Training Area Overlay, Fort Ord and Vicinity. Appendix IV to Annex W, Fort Ord Reg 350-1*. Revised: February 1.
- \_\_\_\_\_, 1977. *Technical Manual, Army Ammunition Data Sheets: Military Pyrotechnics (Federal Supply Class 1370). TM 43-0001-37*. February.
- \_\_\_\_\_, 1978. *Ranges and Training Area Overlay, Fort Ord and Vicinity. Appendix C to Fort Ord Reg 350-5*. Revised as of January 1978.
- \_\_\_\_\_, 1980. *On Post Ranges and Training Areas. Fort Ord Regulation 350-5. Department of Army*. September 9.
- \_\_\_\_\_, 1985. *Authorized Abbreviations, Brevity Codes, and Acronyms, Regulation 310-50, 1985. Headquarters Department of the Army, Washington, D.C.* November 15.
- \_\_\_\_\_, 1987. *Ranges and Training Area Overlay, Fort Ord and Vicinity*. Revised: 15 November 1987.
- \_\_\_\_\_, 2000. *Grenades And Pyrotechnic Signals. Field Manual (FM) 3-23.30*. 1 September.
- U.S. Army Corps of Engineers (USACE), 1968. *Training Facilities Map. Engineer District Sacramento. March*.

\_\_\_\_\_, Engineer District Sacramento, 1972. *Training Ranges and General Road Maps*. 9 June 1972.

\_\_\_\_\_, 1976. *Training Facilities Plan, Future Development, Master Plan*. December.

\_\_\_\_\_, 1977. *Training Facilities Plan, Future Development, Master Plan*. June.

\_\_\_\_\_, 1980. *Training Facilities Map, Basic Information Maps, Master Plan. Sacramento Corps of Engineers*. March.

\_\_\_\_\_, 1984. *Training Facilities Map, Basic Information Maps, Master Plan. Engineer District Sacramento*. June.

\_\_\_\_\_, 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord California. Sacramento District*. April.

U.S. Army Engineer Division, Huntsville (USAEDH), 1994. *Archives Search Report (Supplement No. 1) Fort Ord, California, Monterey County, California. Prepared by U.S. Army Corps of Engineers St. Louis Division*. November.

\_\_\_\_\_, 1995. *Ordnance and Explosives Center of Expertise (OE-CX) Interim Guidance (Draft ETL 1110-1-166)*. U.S. Army Corps of Engineers, Huntsville Center. 5 September.

\_\_\_\_\_, 1997. *Revised Archives Search Report Fort Ord California, Monterey County, California. Prepared by U.S. Army Corps of Engineers St. Louis Division*. December.

U.S. Geologic Survey, 1918. *Topography. Edition of 1913*, reprinted 1918.

UXB International, Inc. (UXB), 1995a. *Final Report for Ordnance and Explosives Removal Action, Fort Ord, California, Primary Report*. November 1.

\_\_\_\_\_, 1995b. *Final Report for Ordnance and Explosive Removal Action Fort Ord, California, Training Site 25 (TS-25)*. November 1.

## TABLES

**Table 27Y-1. Sampling Operations, Site OE-27Y and Vicinity  
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study  
Former Fort Ord, California**

Site	Grid ID or Search Lane ID	Operation Type	Contractor	Geophysical Instrument Used	Grid Completion Date
OE-27Y -- Training Site 25	OE-27Y	Sampling	UXB	SCHONSTEDT GA-52CX	12/21/1994
OE-27Y -- Training Site 25	D3B8G6-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-45 -- Tactical Training Area -- TTA	D3B8G6-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-66 -- Signal Corps Small Arms	D3C8H3-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-66 -- Signal Corps Small Arms	D3D8F6-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available

Sampling = 100 percent of anomalies detected were excavated to a minimum depth of 4 feet.

Deeper anomalies were pursued if directed by the USACE

UXB = UXB international Inc.

HFA = Human Factors Applications, Inc.

Note: A field with the annotation "not available" is a null field in the OE database.

**Table 27Y-2. OE Scrap Found During Sampling, Site OE-27Y  
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study  
Former Fort Ord, California**

Site	Grid ID or Search Lane ID	OE Items	Status	Depth (in)	Quantity
OE-27Y -- Training Site 25	OE-27Y - Lane 5	Signal, illumination, ground, M125 series	Inert	Not available	1

Site = OE Site Number

Grid = Grid in which item was found.

Status = Condition of item, either live or inert. Inert indicates no OE hazard (i.e., OE scrap).

Depth = inches below ground surface that item was found.

Quantity = Number of like items found.

Note: A field with the annotation "not available" is a null field in the OE database.

## PLATES

## Disclaimer

The following plates have been prepared to present pertinent features digitized from historical training maps and scanned aerial photographs. It should be noted that minor discrepancies between source maps, combined with the natural degradation of older source maps and photographs, has resulted in misalignment of some map features. In addition, camera angle and lens distortion introduced into older aerial photographs, combined with changes in vegetation and site features over time may contribute to misalignments of some map features with respect to the aerial photographs.

ATTACHMENT A27Y - A1

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE (TS25)  
LITERATURE REVIEW**

Yes                  No                  Inconclusive

**TYPE OF TRAINING AND OE EXPECTED**

**1. Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades or other launched ordnance)?**

	No	
--	----	--

**Sources reviewed and comments**

No evidence in literature search to support an impact area. This area/vicinity contained many training areas over the years. Was in use as a "Demonstration Area" 10th Infantry '56. "MG 1 & 2" in this area in 1958. MG is possibly machine gun (*Army, 1985*). Identified as "BUT Composite ST Area" in 1964. BUT may stand for Basic Unit Training and ST may stand for Service Test (*Army, 1985*). A "Field Communication Crewman Course" is identified immediately adjacent. "Helipad" is shown in this area on January 1967 map. "Wireman Course" adjacent. Labeled as "BUT Composite ST Area" and as "Aviation Training Area" in 1968. "Wireman Course" adjacent. Helipad shown in this area on June 9, 1972 map (Training Ranges And General Road Map). First labeled as TS-25 (hand drawn boundary) training Facilities notes map. The hand drawn locations on this map are from 1971, 1972 and 1976. TS-25 also identified on March 1980 and June 1984 training maps. "Helicopter Training Area" included this area on 1987 map.

**2. Is there historical evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?**

Yes		
-----	--	--

**Sources reviewed and comments**

Blank small arms ammunition. Revised Archives Search Report (ASR), USAEDH 1997; Review of Fort Ord facilities and training maps, After Action Report - UXB, 1995a.

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE (TS25)  
LITERATURE REVIEW**

Yes                      No                      Inconclusive

**3. Is there historical evidence that training involved use of pyrotechnic and/or smoke producing items (e.g., simulators, flares, smoke grenades) but not explosives?**

Yes		
-----	--	--

**Sources reviewed and comments**

One expended illumination signal found during sampling. Reconnaissance of adjacent Site OE-66 found "expended smoke grenade and signals" (Revised Archives Search Report (ASR), USAEDH 1997; Review of Fort Ord facilities and training maps, After Action Report - UXB, 1995a).

**DEVELOPMENT AND USE OF THE SURROUNDING AREA**

**4. Does subsequent development or use of the area indicate that OE would have been used at the site?**

		Inconclusive
--	--	--------------

**Sources reviewed and comments**

Housing was constructed on adjacent property after 1986. Not known if anything was found during the construction. No development has occurred within the boundary of the site.

**5. Does use of area surrounding the site indicate that OE would have been used at the site?**

		Inconclusive
--	--	--------------

**Sources reviewed and comments**

Area labeled "Demonstration Area" is partially captured by the Site OE-27Y footprint (*Army, 1956*). Not sure what this area was used for. OE scrap (smoke grenade and signals) found on adjacent Site OE-66 (*USAEDH, 1997*).

**ESTABLISHMENT OF SITE BOUNDARIES**

**6. Is there evidence of training areas on aerial photographs that could be used to establish**

	No	
--	----	--

**Sources reviewed and comments**

Many dirt roads and trails in this area, but no clear indication of a defined training area. No structures or permanent features ( 8/17/49; 6/23/51; 5/14/56; 10/18/74; 12/17/75; 6/16/78; 10/22/85; 3/25/86).

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE (TS25)  
LITERATURE REVIEW**

Yes                  No                  Inconclusive

**7. Is there evidence of training on historical training maps that could be used to establish boundaries?**

Yes		
-----	--	--

**Sources reviewed and comments**

Boundary defined on several US Army Corps of Engineers maps from 1976 through 1984. Other training noted in this area (Demonstration Area) '56, Basic Unit Training (BUT) Composite ('68), MG 1& 2 (machine gun?) '58, ST 7 ('61), Aviation Training Area ('68). Army maps also identify a training area, but do not delineate a site boundary.

**8. Should current boundaries be revised?**

	No	
--	----	--

**Sources reviewed and comments**

Review of historical aerial photographs and training maps indicates that Training Site (TS) 25 is within the area of the site boundaries as established in the ASR. Training Site (TS) 25 boundaries defined on the USACE 1980 and 1984 training maps are similar to the combined Site OE-27Y and Site OE-66 boundaries that are presented in the ASR. Site OE-66 was inspected by the USACE UXO Safety Specialist. No evidence of an impact area or the use of HE was found (USAEDH, 1997).

**RESULTS OF LITERATURE EVALUATION**

**Does the literature review provide sufficient evidence to warrant further investigation?**

	No	
--	----	--

**Comments**

Most of the site is included in the existing site boundary. Based on what was found during sampling does not appear to have been used for live firing of anything other than small arms. No evidence found to indicate that this was an impact area or that additional work needs to be performed.

**ATTACHMENT 27Y - A1**  
**EVALUATION OF PREVIOUS WORK**  
**EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE (TS25)**  
**LITERATURE REVIEW**

Yes            No            Inconclusive

**References**

USAEDH, 1997. Revised Archives Search Report, Former Fort Ord, California, Monterey County, California. Prepared by US Army Corps of Engineers St. Louis District.

UXB International Inc (UXB), 1995a. Final Report for Ordnance and Explosives Removal Action Fort Ord, California, Training Site 25 (TS25). November 1.

Army, 1985. *Authorized Abbreviations, Brevity Codes, and Acronyms, Regulation 310-50*. November 15.

Army, 1956. Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "O". Revised December 20.

Field training Areas and range Map, April 27, 1964.

Map of Fort Ord Training Areas and Facilities, January 10, 1958.

Back Country Roads, January 1967.

Training Facilities Map, Basic Information, March 1968.

Topo map with tng fac notes, 1976.

Training Facilities Plan (Dec 76) Future Development.

Training Facilities Map (Jun 84) Basic Information.

Ranges and Training Area Overlay, November 15, 1987.

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE 25 (TS25)  
SAMPLING EVALUATION**

Yes                  No                  Inconclusive

**1. Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades and other launched ordnance)?**

	No	
--	----	--

**Sources reviewed and comments**

Nothing found to support use as an impact area. One scrap item (illumination signal) and live small arms ammunition (blanks) were found during sampling. (UXB, 1995, USAEDH 1997; Review of Fort Ord facilities and training maps).

**2. Is there evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?**

Yes		
-----	--	--

**Sources reviewed and comments**

One scrap illumination signal and small arms ammunition (blanks) were found during sampling (UXB, 1995).

**3. Is there evidence that training involved use of pyrotechnic and/or smoke producing items (e.g., simulators, flares, smoke grenades) but not explosives?**

Yes		
-----	--	--

**Sources reviewed and comments**

One scrap illumination signal and small arms ammunition (blanks) were found during sampling (UXB, 1995).

**4. Was sampling and/or reconnaissance performed within the appropriate area?**

Yes		
-----	--	--

**Sources reviewed and comments**

The sample lanes are within the site boundary (UXB, 1995).

**5. Does sampling indicate OE and/or ordnance-related scrap are present at the site?**

Yes		
-----	--	--

**Sources reviewed and comments**

Only 1 scrap illumination signal and small arms ammunition (blanks) were found during sampling (UXB, 1995).

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE 25 (TS25)  
SAMPLING EVALUATION**

Yes                  No                  Inconclusive

**6. Were the type(s) of items found consistent with the type of training identified for the site?**

Yes		
-----	--	--

**Sources reviewed and comments**

Consistent with use of the site for troop training including bivouac area and consistent with OE-related items found at other Fort Ord training areas (USAEDH, 1997).

**7. Were the type(s) of items found consistent with the era(s) in which training was identified?**

Yes		
-----	--	--

**Sources reviewed and comments**

The illumination signal found at the site has been in use since at least 1977 (Army, 1977).

**8. Was HE fragmentation found?**

	No	
--	----	--

**Sources reviewed and comments**

No HE identified (UXB, 1995).

**9. Was HE found?**

	No	
--	----	--

**Sources reviewed and comments**

No HE found (UXB, 1995; USAEDH 1997).

**10. Were LE found?**

Yes		
-----	--	--

**Sources reviewed and comments**

Blank small arms ammunition (UXB, 1995; USAEDH 1997).

**11. Were pyrotechnics found?**

	No	
--	----	--

**Sources reviewed and comments**

One scrap illumination signal found (UXB, 1995).

**12. Were smoke producing items found?**

	No	
--	----	--

**Sources reviewed and comments**

No smoke producing items were found. Expended smoke grenade found at adjacent Site OE-66 (UXB, 1995; USAEDH, 1997).

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE 25 (TS25)  
SAMPLING EVALUATION**

Yes                  No                  Inconclusive

**13. Were explosive items found (e.g. rocket motors with explosive components, fuzes with explosive components)?**

	No	
--	----	--

**Sources reviewed and comments**  
(UXB, 1995; USAEDH 1997)

**14. Do items found in the area indicate training would have included use of training items with energetic components?**

Yes		
-----	--	--

**Sources reviewed and comments**  
Because expended pyrotechnic items were found, pyrotechnics may have been used during training. (UXB, 1995; USAEDH, 1997)

**15. Were items found in a localized area (possibly the remnants of a cleanup action)?**

	No	
--	----	--

**Sources reviewed and comments**  
(UXB, 1995)

**16. Has the site been divided into sectors to focus on areas of common usage, similar topography and vegetation, and/other unique site features?**

	No	
--	----	--

**Sources reviewed and comments**  
(UXB, 1995)

**17. Should current site boundaries be revised?**

	No	
--	----	--

**Sources reviewed and comments**  
No change of site boundaries based on the results of the sample data. Training Site (TS) 25 boundaries defined on the USACE 1980 and 1984 training maps are similar to the combined Site OE-27Y and Site OE-66 boundaries that are presented in the ASR. Site OE-66 was inspected by the USACE UXO Safety Specialist. No evidence of an impact area or the use of HE was found (USAEDH, 1997).

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE 25 (TS25)  
SAMPLING EVALUATION**

Yes                  No                  Inconclusive

**18. Was equipment used capable of detecting items suspected at the site at the maximum expected depth?**

Yes		
-----	--	--

**Sources reviewed and comments**

Site was not suspected to have been used as an impact area. OE items suspected at this site were non-penetrating (Parsons, 2001). Site was sampled to a depth of 4 feet (UXB, 1995).

**19. Was equipment used capable of detecting the types of items (e.g., non-ferrous) suspected at the site?**

Yes		
-----	--	--

**Sources reviewed and comments**

Yes, with the exception of the non-ferrous small arms ammunition. Schonstedt Model GA-52/Cx only detects ferrous metals.

**20. Do the results of the ODDS indicate that items suspected at the site would have been detected by the instrument used at the time of investigation?**

Yes		
-----	--	--

**Sources reviewed and comments**

Although not directly comparable to Site OE-27Y, the results of the ODDS indicate that all models of the Schonstedts used at this site area capable of detecting the ferrous surface OE (Type I items) expected at this site. Small arms ammunition is non-ferrous and cannot be detected with a magnetometer. Illumination signals listed as Type I item in the ODDS (Parsons, 2001). Instrument listed in the after action report is the Schonstedt GA-52/Cx (UXB, 1995; Parsons, 2001).

**21. Do results of the investigation indicate that suspected items could be detected with a high level of confidence at observed and expected depth ranges?**

Yes		
-----	--	--

**Sources reviewed and comments**

Yes. The items used at the site have minimal penetration ability (Parsons, 2001). If on the surface and not obscured by vegetation detection, should approximate 100%. However, small arms ammunition is not detectable with the Schonstedt.

**ATTACHMENT 27Y - A1  
EVALUATION OF PREVIOUS WORK  
EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE 25 (TS25)  
SAMPLING EVALUATION**

Yes                  No                  Inconclusive

**22. Were all the instruments used to evaluate the site maintained and calibrated in accordance with associated work plan and manufacturer's specifications?**

Yes		
-----	--	--

**Sources reviewed and comments**

Reports indicate that instruments were used according to the work plan.

**23. Based on the anticipated target density (UXO items per acre) has the minimal amount of sampling acreage been completed in accordance with the scope of work or contractor work plan?**

Yes		
-----	--	--

**Sources reviewed and comments**

"UXB was directed to randomly sample 25% of this area" (UXB, 1995)

**24. Based on sampling procedure (e.g., grids, transects, and/or random walks) was a percentage of the site completed to provide 95% confidence in a UXO density estimate, and if so provide total area investigated and the UXO density estimate.**

		Inconclusive
--	--	--------------

**Sources reviewed and comments**

1,530,000 square feet of sample lanes established. 25% of each lane is 21,250 sq ft.x18 lanes = 382,500 sq ft. total (approximately 9 acres). (UXB, 1995).

Total Area: 382,500 square feet	
UXO Density: Not calculated	

**25. What percentage of the anomalies were intrusively investigated?**

**Sources reviewed and comments**

"every magnetic anomaly found was marked and excavated" (UXB, 1995).

Total % of anomalies investigated:	100%
------------------------------------	------

**26. Was the appropriate data processing scheme used for the site, how was the data processed?**

		Not Applicable
--	--	----------------

**Sources reviewed and comments**

Not applicable. No digital geophysical data were collected.

**ATTACHMENT 27Y - A1**  
**EVALUATION OF PREVIOUS WORK**  
**EVALUATION CHECKLIST: SITE 27Y, TRAINING SITE 25 (TS25)**  
**SAMPLING EVALUATION**

Yes                  No                  Inconclusive

**27. Has the field data been collected and managed in accordance with quality control standards established for the project?**

Yes		
-----	--	--

**Sources reviewed and comments**

Quality Control "(QC) checks were performed on each grid after all UXO operations were complete. UXB QC specialists checked a minimum of 10% of each grid to ensure that OE removal was done properly. After this QC check the CEHND Safety Specialist performed a QA check of the site prior to accepting it" (UXB, 1995).

**Result of Sampling Evaluation**

**Does the sampling evaluation provide sufficient evidence to warrant further investigation?**

	No	
--	----	--

**Comments**

No further OE-related investigation is warranted. Results of sampling do not indicate that this was an impact area. No evidence found of high or low explosives. Only 1 expended illumination signal (OE scrap) and blank small arms ammunition were found. With the exception of small arms ammunition, the instruments used at this site were capable of detecting the type of OE expected at this site.

**References**

Army, 1977. Technical Manual, Army Ammunition Data Sheets: Military Pyrotechnics (Federal Supply Class 1370). TM 43-0001-37. February.

Parsons, 2001. Draft Final Ordnance Detection And Discrimination Study (ODDS), Former Fort Ord, Monterey, California. December.

USAEDH, 1997. Revised Archives Search Report, Former Fort Ord, California, Monterey County, California. Prepared by U.S. Army Corps of Engineers St. Louis District.

USAESCH, 1997. Penetration of Projectiles Into Earth, An Analysis of UXO Clearance Depths at Ft. Ord. September 10. Appendix F of the Phase 2 EE/CA.

UXB International Inc., (UXB), 1995. Final Report for Ordnance and Explosives Removal Action, Fort Ord, California, Training Site 25 (TS 25). November 1.

ATTACHMENT A27Y - A2

## ATTACHMENT OE-27Y – A2

### POTENTIAL ORDNANCE USED AT SITE OE-27Y

#### *Pyrotechnic Ground Signals (Star Cluster)*

M125, M125A1, M158 and M159 Star Cluster Ground Illumination Signals – The M125, M125A1, M158 and M159 Star Cluster Pyrotechnic Signals are designed for daytime or nighttime signaling. Star cluster signals consist of five-star illuminant assemblies and a rocket motor propulsion assembly contained in a hand-held aluminum launching tube. The base of the launching tube contains a primer and an initiating charge. As shipped, the firing pin cap is assembled to the forward end and must be reversed for firing. Stabilizing fins on the tail assembly of rocket are folded parallel to the axis of the signal. A bolt, which also transfers the initiating charge flash to the propellant, extends into the center of the solid propellant which fills the propulsion assembly. The illuminant assembly is mounted on top of the propulsion assembly with a delay assembly and an expelling charge between. A label specifying firing procedures is secured to the body of the signal (*Army, 1977*).

When the firing cap is placed on the initiator end in preparation for firing the signal, the firing pin is aligned with the primer. Striking the primer with the firing pin fires the initiating charge (black powder) to ignite the rocket propellant (black powder). As the rocket emerges from the launching tube, the fins extend for flight stability. Before rocket motor burnout at 200 feet, the black powder expelling charge is ignited performing the twofold function of expelling and igniting the 5-star illuminant assemblies. Burning time is 6 to 10 seconds with burnout occurring at 250 to 300 feet above the ground (*Army, 1977*).