SITES THAT DO NOT MEET TRACK 1 CRITERIA, BUT WILL BE MAINTAINED IN THE TRACK 1 PROCESS

SITE OE-24C

LIVE GRENADE RANGE

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SITE OE-24C LIVE GRENADE RANGE

3.24C Site OE-24C (Live Grenade Range)

This summary report consists of two parts. The first part, contained in Sections 3.24C.1 through 3.24C.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 3.24C.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 3.24C.1) and evaluation of sampling process(es) (Section 3.24C.6.2). These discussions are based on information from standardized literature review and sampling review checklists (Attachment 24C-A1). Section 3.24C.7 provides conclusions and recommendations for the site. References are provided in Section 3.24C.8.

3.24C.1 Site Description

Site OE-24C is 9.7 acres in size and is located in the west-central portion of the former Fort Ord (Fort Ord) to the south of the Main Garrison and just north of the Multi-Range Area (MRA) (Plate 24C-1). Site OE-24C was identified through a review of a 1946 Fort Ord historical map as part of the Supplement to the Fort Ord Archive Search Report (ASR; *U.S. Army Engineer Division, Huntsville [USAEDH], 1994*).

3.24C.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 angles and lens distortion introduced into older aerial photographs combined with changes in vegetation and site features over time may contribute to misalignment of some map features with respect to aerial photographs.

Pre-1940s Era

This site lies within a tract of land purchased from private landowners by the government in 1917 (*Arthur D. Little, Inc. [ADL], 1994*). Documentation of pre-1940s era use of this area by the army for training is limited to 1918 and 1933 topographic maps of the area (*Department of the Interior [DOI], 1918, U.S. Army [Army], 1933*). No identifiable features or text were associated with this area. Eucalyptus Road is shown on the 1933 topographic map and is close to its present location.

1940s Era

Review of 1940s era documentation including historical maps and aerial photographs indicates that several training areas including a live grenade range were present in this area in the 1940s.

- A live grenade range training area is shown on 1945 and 1946 training maps (*Army, 1945, 1946*). A practice hand grenade range (Site OE-24B) is identified northeast of live grenade range. Practice rifle grenade ranges and a booby trap training areas are also shown on the map in the vicinity of the live grenade range (Sites OE-24D and 24E).

- Aerial photographs from 1949 and 1951 (Plate 24C-2) show disturbed/cleared areas in the vicinity of the training areas as identified on the training maps (approximately 300 by 300 feet in size).

1950s Era

Review of 1950s era documentation including training maps, aerial photographs, and grading plans indicated that live grenade training ended sometime prior to 1954 and that the area was developed as base housing by 1959. The following identifies the results of the historical map and aerial photograph review:

- A field battalion training area (FBTA) and a Reconnaissance Selection and Occupation of Position (RSOP) training area is identified on the 1956 training map in the vicinity of this site (*Army, 1956*).

- A partially cleared area is present on a 1956 aerial photograph to the south of the site (Site OE-24A).

- Grading plans dated 1957 are available for the site area showing the planned development of this area for the East Officers Housing Area. Plans show as-built revisions dated 1959 (*U.S. Army Corps of Engineers [USACE], 1959*). The available plans are digital versions of the original plans. The quality of the images is not sufficient to identify the changes in ground surface elevation related to grading.

- Aerial photographs from 1959 show the completed East Officers Housing Area (*USACE, 1960*). It appears that the areas that were cleared of vegetation on the 1949 photograph are covered with housing or fill material by 1959. A cleared area (OE-24A) is still present south of the site. This area is identified as an RSOP area on the 1956 map (*Army, 1956*).

1960s to Present

Military housing was completed in 1959 and 1961 and was occupied from the 1960s to present. The closest training areas used from the 1960s until present are south of the site inside the MRA.

- No training sites are present in this area on training maps from 1964 though 1987 (*Army, 1964 and 1987*).

- Housing is present over the former site area on a 1966 aerial photograph (Plate 24C-3). The housing is identified as Rogers Fitch Park on a 1967 map (*Army, 1967*).

- A rifle smoke grenade and 100 M1 Rounds (both Ball and Tracer small arms ammunition) were discovered northeast of the site in February 1993. Two practice 40mm projectiles were discovered northwest of the site in August 1997. The 40mm practice projectiles were not available for use in the 1940s.

Proposed Future Land Use

The proposed reuse of this area is continued military housing.

3.24C.3 Potential Ordnance based on Historical Use of the Area

This section describes the types of training devices that could have been used at a live grenade range in the 1940s. Information on hand grenades used during World War II (WWII) was obtained from *The American Arsenal, The World War II Official Standard Ordnance Catalog of Small Arms, Tanks, Armored Cars, Artillery, Antiaircraft Guns, Ammunition, Grenades, Mines, etcetera* (*Hogg, 2001*).

Five types of grenades were identified for use in WWII. These include fragmentation, offensive, chemical, practice, and training grenades. Because it is not known which grenades were authorized for this area, a brief description of each type is provided below. Additional details on these items are provided in Attachment 24C-A2:

- The standard fragmentation grenade used was a MK IIA1-Standard. Fragmentation grenades contain a high-explosive charge in a metallic body that is shattered by the explosion of the charge.
- The offensive hand grenade used was a MK IIIA1 – Limited Standard. The offensive hand grenade contains a high-explosive charge in a paper body, and is designed for demolition or lethal shock effect.
- The chemical hand grenades contain a chemical agent, which produces a toxic or irritant effect, screening smoke, or incendiary action or combination of effects.
- A MK II –standard practice grenade was also available that was equipped with a M10A3 igniting fuze, and is loaded with a small black powder charge.
- The training grenade, MK IA1 was an inert grenade and contained no charge.

It is also possible that pyrotechnic items could have been used in conjunction with this training. All OE items would be expected to be found at the surface or in the near surface.

3.24C.4 History of OE Investigations

The following describes the OE investigations performed at this site.

1994 Archives Search Report, Supplement 1

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. The archives search was conducted in accordance with the Scope of Work provided to the St. Louis Corps of Engineers by the Huntsville Corps of Engineers, and U.S. Army Corps of Engineers guidance published in June 1994. The archives search included a Preliminary Assessment/Site Inspection (PA/SI) consisting of interviews with individuals familiar with the sites, site visits to previously established sites, site reconnaissance on newly identified training areas, and the review of data collected during sampling or removal actions.

Site OE-24 was identified as a new site as part of the November 1994 Archives Search Report Supplement (*USAEDH, 1994*). This site is described as containing several rifle and hand grenade ranges, both practice and live sites, based on review of a 1946 map. A site visit was conducted and a piece of a warhead was found just north of Eucalyptus Road (OE-24A). The warhead was believed to be part of a high explosive grenade. Sampling of a 10-acre area surrounding the item find was proposed in the ASR. Requirements for preparation of an ASR are described in Section 2.0 of this report.

1994 UXB International Investigation

UXB International, Inc. (UXB) completed land surveying of the sites and may have performed some brush cutting within the site boundaries as part of their investigation (*USA Environmental [USA], 2000*). No geophysical activities or intrusive activities were completed. The land surveyed site boundaries are presented on Plate 24C-4. No OE finds are documented in the land surveying report (*UXB, 1995*).

1997 CMS Investigation

CMS Environmental (CMS) completed sampling at Site OE-24C in 1997 (*USA, 2000*). One 100- by 200-foot (standard SiteStats/GridStats [SS/GS] sample grid) sample grid and 3 sample grids of non-standard dimensions, not 100 by 200 feet, were sampled using the SS/GS sampling program (total of 48,250 square feet). Two of the four sample grids were established outside of the site boundary due to terrain and structures within the site (Plate 24C-4). According to the CMS work plan the sample grids were surveyed using a maximum 5 foot search lane with a Schonstedt Model 52/Cx magnetometer. Following the survey that located 1,850 anomalies, 265 anomalies were selected for sampling by the SS/GS program. These anomalies were excavated at various depths down to 2 feet. The remaining anomalies were not excavated. Most of the non-OE anomalies excavated were nails, screws, and wires. OE-related items identified during sampling included 1 expended grenade fuze (model not reported), a 30 cal Dummy, an M159 ground illumination signal, an M17A1 ground signal, parachute, an AN-MK13 Mod 0 Marine smoke and illumination signal, and MK II hand grenade fragments. The grenade fragments were detected to a depth of 12 inches and the signals were found within a pit at a depth of 2 feet. A tin can was detected at 18 inches. No live items were identified during sampling, and no further OE response was recommended in the after action report (*USA, 2000*).

3.24C.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. The CSM presented here is based on historical information and OE investigations completed to date. It is provided to help evaluate the adequacy of the investigation completed to date and to identify potential release and exposure pathways. 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-24C is based on currently available site-specific and general information including literature reviews, sampling results, aerial photographs, maps, technical manuals, and field observations, and the information shown on Plate 24C-5.

3.24C.5.1 Training Practices

Live Grenade Training Area

Site OE 24C is categorized as a live grenade training area. Based on the size of the cleared area (an approximately 300- by 300-foot cleared area) it is anticipated that the area was a hand grenade training area. Based on 1983 *Policies and Procedures for Firing Ammunition for Training, Target Practice and Combat* (*Army, 1983*), the danger area for hand grenades is about 450 feet, while the impact area for rifle grenades is about 1,200 feet.

Hand grenade training areas usually consist of throwing bays or trenches, observation bays, and targets. According to the 1983 guidance, targets are a minimum of 25 meters from the throwing bays. Throwing bays should be separated by 20 meters unless they are separated by another physical barrier such as an earthen berm or concrete. It is anticipated that similar guidance would have been used prior to 1983.

Field Battalion Training Area (FTBA) and Reconnaissance, Selection, and Occupation of Position (RSOP) Training Areas

These training areas are not discussed in the conceptual site because the training that occurred in these areas would not be expected to use OE other than small arms blanks, simulators, and pyrotechnics. In addition, the FBTA is over 1,500 feet from the site.

3.24C.5.2 Site Features

Site OE-24C was identified on historical training maps (1945) as a live grenade training area. A disturbed vegetation area with possible manmade throwing bays or other structures is present on both the 1949 and 1951 aerial photographs. Although maps showing the configuration of hand grenade ranges at Fort Ord in the 1940s are not available, the aerial photograph review suggests that the area was used as a grenade training area in the 1940s. Review of training maps from the 1950s does not indicate that this area was used for grenade training after the 1940s. Housing was constructed in this area between 1957 and 1961. Grading was completed prior to construction of the housing.

3.24C.5.3 Potential Sources and Location of OE

Site OE-24C was used for live grenade training in the 1940s. Based on the use of this area as a live grenade training area the types of OE that would be expected include Mark II Grenades, grenade fuzes, and possibly pyrotechnic items associated with training at the grenade range. These items would normally be found at the surface of the site; however, it is possible that OE could be below the ground surface in areas of the site that were graded prior to construction of the housing.

No OE was discovered at this site during sampling; however, grenade fragments, a grenade fuze, and buried pyrotechnic items were discovered. These OE items indicate that the site was used as a live grenade range prior to construction of the housing. Review of historical records did not indicate that any 1940s-era OE items were found during the 40 plus years that the housing area has been occupied.

3.24C.5.4 Potential Exposure Routes

Access to this site is currently unrestricted and has been open to the public for over 40 years. Because no OE items were discovered during sampling or reported previously, it is unlikely that OE exists at the surface in this area. Therefore, it is unlikely that a receptor would come in contact with an OE item on the surface. Because the site was graded prior to construction of the housing, it is possible that OE, including MK II hand grenades, could be present below the ground surface. It is possible, although not likely, that future construction workers could come in contact with OE, including MK II high explosive grenades, during excavation activities. The MK II high explosive grenade is designed to produce casualties by high velocity projections of fragments. Incidental contact with a high explosive MK II grenade could cause injury or death.

3.24C.6 Site Evaluation

The available data (e.g., archival and reconnaissance data) regarding Site OE-24C 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 24C-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.

3.24C.6.1 Literature Review

Type of Training and OE Expected

According to training maps, Site OE-24C was used as a live hand grenade training area in the 1940s and possibly the early 1950s. The literature indicates that this would not be an impact area for fired projectiles, but that live hand grenades (high explosive [HE] or smoke-producing items) may have been used for training at this site. It is also possible that pyrotechnic items could have been used during training.

Subsequent Use of the Area

Subsequent use of this area was for residential housing. Review of 1950s grading maps indicates that this area was graded prior to construction of the housing. Grading plans indicate that both cut and fill areas were present in the OE-24C area. As stated in Section 3.24C.2, the quality of the grading plan images is not sufficient to identify the changes in ground surface elevation that resulted from the grading. It is anticipated that any OE found during construction of the housing in the late 1950s would have been removed; however, this is not documented. After construction of the houses, the closest training areas were located within the MRA.

Establishment of Site Boundaries

Review of historical aerial photographs and training maps indicates that the hand grenade range is in the area where the current site boundaries were established in the ASR, although the former Live Grenade Area may include an area to the south of the ASR boundaries (Plate 24C-4). The initial site boundary was established by UXB in 1994 based on information provided in the 1994 ASR supplement. No additional information on establishment of site boundaries is provided in the USA after action report, other than a reference to boundaries provided in the 1997 ASR. Two of the four grids sampled at this site are however, located to the south of the ASR boundaries and cover this area to the south of the site boundaries.

Summary of Literature Review Analysis

Based on a review of site literature there was sufficient historical evidence to warrant sampling of this site. The historical information indicated that this area was used as a live grenade range in the 1940s. Based on the literature review, the training area may have extended to the south into the area sampled by Grid C-1.

3.24C.6.2 Sampling Review

This section describes the items that were found during sampling at Site OE-24C and the types of fillers that would be used in the items. The review includes a comparison of sampling locations relative to site boundaries. Also presented are a review of the equipment used during sampling, a discussion of the sampling methods used and the quality control measures used during the investigation.

Sampling Results (Items Found)

Sampling was conducted at Site OE-24C in 1997. SS/GS sampling was conducted on four sample grids. Three OE scrap items (ground illumination signal, ground parachute signal, and a smoke signal) were found 2 feet below ground surface (bgs). The items were found in a pit located within Grid FP05 that is located to the south of the site boundaries (Plate 24C-4). These pyrotechnic items included a Navy signal that is used for day or night use by aircraft crewmen downed at sea and 2 Army signals used for day or nighttime signaling (Table 24C-2). In addition, 54 pieces of grenade fragments (MK II), one expended grenade fuze (model not reported), and a 30 cal Dummy were identified during the sampling. The frag was located in Grids 01C, 02C, and 03C (Plate 24C-4) and was discovered at depths of 1 to 12 inches bgs. The expended grenade fuze was identified in Grid 02C and the 30 cal Dummy was identified in Grid 03C. The grenade fragments support the use of the site as a Live Grenade Area in the 1940s.

Site Boundaries Review

A review of the sampling results indicates that the grenade fragments were found in the 3 northernmost grid locations, but none were found in the southernmost grid (Grid FP05). The items that were identified in Grid FP05 were found in a pit, which may indicate that they were not associated with the grenade range. Based on the results of sampling, the training area may have extended south into the area sampled by Grid 01C because grenade fragments were found in the grid.

Equipment Review

CMS used the Schonstedt Model GA-52/Cx magnetometer to survey Site OE-24C. A maximum search lane of 5 feet was used during sampling. 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, a gradient magnetometer like the Schonstedt Model GA-52/Cx is especially sensitive to smaller, near-surface ferro-metal objects *(Breiner, 1973)*.

The performance of the Schonstedt Model GA-52/Cx at Fort Ord was evaluated as part of the Ordnance Detection and Discrimination Study (ODDS, *Parsons Infrastructure & Technology Group, Inc. [Parsons], 2001b*). 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 the static tests; therefore, only the seeded test results and the field trial tests are discussed herein. It is recognized that the ODDS study areas may not represent the same field conditions as are present at OE-24C; therefore, differences in field conditions, if applicable, should be considered when using information from the ODDS.

During the seeded test, the Schonstedt Model GA-52/Cx detected between 67 and 78 percent of Type I items (type I items included the MK II hand grenade) buried up to 1 foot below the calculated penetration depth. The detection rate percentages presented in the ODDS vary according to the search radius used (either 1.5 or 3.3 feet) for the analysis, and assume a 5-foot wide search lane. Results for the 3 foot search lane, also evaluated as part of the ODDS, are not included in the detection percentages presented above, because the 3-foot wide search lanes were not used during the investigation. A standard search radius for investigating anomalies was not specified in the CMS work plans or after action report; therefore, the detection "range" based on the two search radii is presented above. These detection rates are considered conservative because an additional 1 foot was added to the items' calculated penetration depth to allow for soil deposition over time. Because the field conditions at the seeded test site and orientations of buried items may not be comparable to the Site OE-24C conditions, the results should only be used as an indication that the equipment is capable of detecting the same types of items.

Results of the ODDS field trail tests were also reviewed for potential use in evaluating instrument performance at Site OE-24C. Detection ranges for the Schonstedt Model GA-52/Cx were calculated for 4 of the 6 test sites; the remaining sites did not have enough OE detected to allow calculation of site statistics. A standard search radius for investigating anomalies was not specified in the CMS work plan or after action report; therefore, the detection "range" based on the two search radii (1.6 and 3.3 feet) is presented above. The calculated detection rates for the combined sites ranged from 97 to 99 percent depending on the search radius used for the calculation. 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 ordnance densities. Therefore, the field trail results may not be applicable to Track 1 sites.

Results of the ODDS field trails for the field test site FTS-3, which has an OE item density most like Site OE 24C, were also reviewed. Five OE-related items were located at FTS-3 during the investigation, and no additional OE items were found after sifting of 10 percent of each grid. This result indicates that it is unlikely that OE items would remain at FTS-3. Similar results could be expected at other sites, such as OE-24C, after survey and clearance using a Schonstedt Model GA-52/Cx.

Although not directly comparable to Site OE-24C, the results of the ODDS indicate that the Schonstedt model used at this site is capable of detecting the ferrous surface and subsurface OE expected at this site.

Sampling Methods Discussion

SS/GS sampling methodologies were used at this site. SS/GS is a computer program used to statistically estimate the ordnance density of a site or grid during field investigations. It estimates the number of ordnance items at a given site or grid and can be used to assess whether a site has been characterized adequately. This program was designed so there were equal chances of finding OE and non-OE related items. Excavation of anomalies identified with a magnetometer is performed in accordance with direction of the program; generally 32 to 40 percent of the flagged anomalies are investigated using this technique (*CMS, 1995*).The SS/GS methodology was reviewed by the EPAs Federal Facilities Restoration and Reuse Office. The Technical Support Center, EPA National Exposure Research Laboratory (NERL) in Las Vegas, Nevada also provided statistical assistance in reviewing the SS/GS methodology. Several

problems were identified as a result of the review. The primary conclusions were: 1) the statistical procedures were vague and not well documented, 2) conclusions about homogeneity are not consistent, 3) the stopping rules are faulty and 4) the program was not able to identify UXO clusters at a site. Although these problems were identified, the information obtained during sampling is useful in identifying the presence and type of OE present at the site.

As part of this sampling at Site OE-24C, four grids varying in size from 4,500 square feet to 20,000 square feet were sampled (total of 1.11 acres). One thousand eight-hundred fifty anomalies were identified within these grids and 265 (14 percent) were sampled. As noted above, no OE items were identified; however, scrap OE and fragments were identified. Because no OE items were identified in the 265 anomalies excavated, the expected number of OE items calculated by the SS/GS program is zero.

Quality Assurance/Quality Control

Field Sampling

Throughout the operations at Site OE-24C, the contractor performed daily operational checks and Quality Control (QC) inspections of the SS/GS work done on this site (*USA, 2000*). Quality Assurance (QA)/QC performed throughout the field sampling is documented in the AAR (*USA, 2000*). Because of the nature of the SS/GS sampling, QA/QC was limited to inspections of operational activities and documentation. No deficiency reports were written during inspections. In accordance with the USA/CMS work plan, all instruments requiring maintenance and/or calibration were to be checked prior to the start of each workday. Batteries were to be replaced as needed and the instruments were to be checked against a known source. The QC specialist was responsible for ensuring that personnel perform operational checks and maintain appropriate log entries. The QC specialist also was to perform random unscheduled checks of the various sites to ensure that personnel perform the work as specified in the work plan.

Data Management

Parsons, the current OE contractor, performed a 100 percent QC review of the data associated with this site (*Parsons, 2001a*). This review followed the guidelines presented in the Standard Operating Procedures (SOPs) provided as Appendix A. This review included review of the SS/GS records, review of the field grid records, and review of the database created by the OE contractor. The USACE followed up with a 10 percent QA review of the Parsons data review. The requirements of this QA review are described in the SOP provided as an Appendix B to the Track 1 Remedial Investigation (RI). The purpose of the data review was to complete a 100 percent check of all available grid and SS/GS records to identify discrepancies between the after action reports and the grid records, if any. Discrepancies were then researched and corrections made, if appropriate, prior to loading the data into the project database. Information from the SS/GS sampling indicated that a grenade fuze and MK II grenade fragments were found during sampling. This information was not identified in the associated grid record, but was added to the database based on the identification in the SS/GS records.

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

- The grenade fuze and grenade fragments can be located to the grid. Information on location within the grid is not available.
- The data collected are useful in providing information concerning the type of OE scrap items present at the site.

- Because some anomalies were not excavated using the SS/GS investigative approach, some OE scrap items may still be present within the sampling grids.

- Because no OE, only OE scrap, was found during investigation of 265 anomalies, it is reasonable to expect that OE would not be present in the remaining anomalies; however, because these anomalies were not investigated this cannot be verified.

- Problems have been identified with the statistical methods used in the SS/GS sampling, as noted above; however, the sampling results are still useful in identifying OE potentially present at the site.

3.24C.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.

3.24C.7.1 Conclusions

Site Use and Development

- The site appears to have been used as a live hand grenade range in the 1940s. Both historical data and sampling data support this conclusion.

- The sample grids appear to have been placed in the area used as a live grenade range based on review of historical information and sampling results. No changes to the site boundaries are recommended.

- Review of grading plans for the housing development and aerial photographs following development of military housing indicates that the site was filled/cut prior to completion of the housing. It is expected that any OE identified would have been removed at that time.

- No incidental OE finds of MK II hand grenades or any other WWII-era ordnance is documented in this area. Several incidental finds of 40mm items have been documented in this area, but these items were not available for use in the 1940s.

Sampling Adequacy and Data Quality

- Sampling was completed both within the current ASR site boundary, and the 1945 digitized site boundary. Portions of the area within the site boundary are covered with housing, roads, or other features that would prevent further sampling. It appears that the sampling completed to date covers most of the suspect area that could be sampled without removing houses, roads, or other structures.

- The Schonstedt Model GA-52/Cx was used for all geophysical surveys. This instrument was evaluated as part of the ODDS and is capable of detecting the type of items expected at this site. A numerical value for detection of items cannot be calculated for an individual site because of differences in site conditions between the ODDS sites and Site OE-24C.

- The sampling methodology used for this site was SS/GS. Problems with the statistical methods used in the program have been identified; however the data collected are useful in evaluating the past use and potential distribution of OE at this site.

- Although the previous OE sampling efforts performed at Site OE-24C are not consistent with requirements in place today, the quantity and quality of the available information is sufficient to make informed decisions regarding the site. The entire site was not sampled, however, historical information indicates that this area was used as high explosive MK II grenade range, and data collected during the sampling supports this assumption.

3.24C.7.2 Recommendations

Based on the review of existing data:

- It is not anticipated that OE remains at Site OE-24C. However, because Site OE-24C was used for live grenade training, and fragments from high explosive MK II grenades were found during sampling, additional evaluation of this site is recommended. This site should be retained in the Track 1 process.

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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.

TABLES

Table 24C-1. Sampling Operations, Site OE-24C
Track 1 Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site	Grid ID	Operation Type	Contractor	Geophysical Instrument Used	Grid Completion Date
OE-24C -- Live Hand Grenade Range	OE-24C (01 C)	SS/GS	USA	SCHONSTEDT GA-52CX	4/28/1997
OE-24C -- Live Hand Grenade Range	OE-24C (02 C)	SS/GS	USA	SCHONSTEDT GA-52CX	4/29/1997
OE-24C -- Live Hand Grenade Range	OE-24C (03 C)	SS/GS	USA	SCHONSTEDT GA-52CX	4/30/1997
OE-24C -- Live Hand Grenade Range	OE-24C (FP 05)	SS/GS	USA	SCHONSTEDT GA-52CX	8/27/1997

Site = OE Site Number
Grid ID = Only the portion of the Grid ID within parenthesis is posted on Plate 24C-4
SS/GS = Sitestats/Gridstats sampling was performed, selected anomalies were excavated.
USA = USA Environmental, Inc.
Grid Completion Date = Work may have been conducted within a particular grid on more than one date.

Table 24C-2. OE Scrap Found During Sampling, Site OE-24C
Track 1 Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site	Grid ID	OE Items	Status	Depth (in)	Quantity
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	1	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	1	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (01 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	Fuze, grenade,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	Fuze, grenade	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	5	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	5	1

Table 24C-2. OE Scrap Found During Sampling, Site OE-24C
Track 1 Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site	Grid ID	OE Items	Status	Depth (in)	Quantity
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	12	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	10	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	5	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (02 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	5	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	1	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	1	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	8	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	2	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	6	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1

Table 24C-2. OE Scrap Found During Sampling, Site OE-24C
Track 1 Ordnance and Explosives Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site	Grid ID	OE Items	Status	Depth (in)	Quantity
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	1	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	4	1
OE-24C -- Live Hand Grenade	OE-24C (03 C)	UNKNOWN MODEL: FRAGMENTS,	Inert	3	1
OE-24C -- Live Hand Grenade	OE-24C (FP 05)	Signal, illumination, ground, M125	Inert	24	1
OE-24C -- Live Hand Grenade	OE-24C (FP 05)	Signal, illumination, ground, parachute,	Inert	24	1
OE-24C -- Live Hand Grenade	OE-24C (FP 05)	Signal, smoke and illumination, marine,	Inert	24	1

Site = OE Site Number
Grid ID = Grid in which item was found. Only the portion of the Grid ID within parenthesis is posted on Plate 24C-4.
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.

ATTACHMENT 24C – A1

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 1: LITERATURE REVIEW

TYPE OF TRAINING AND OE EXPECTED

	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 or other launched ordnance)?***		No	

Sources reviewed and comments
No evidence to support an impact area. This OE site was identified as "Live Grenade" on a 1945 Training Facilities map. The site is one of four hand and rifle grenade training locations in this area, identified on the 1945 and 1946 Training Facilities maps. The four grenade training areas are not identified on available training maps after 1946 (e.g., Circa 1954 map or after).

References:
1945 Training Map, 1946 Master Plan, Circa 1954 Training Map.

	Yes	No	Inconclusive
2. ***Is there historical evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?***	Yes		

Sources reviewed and comments
Live grenades are considered HE items. Fragments located at the site indicate potential for HE grenades.

References:
Revised Archives Search Report (ASR), USAEDH 1997; Review of Fort Ord facilities and training maps, After Action Report - HFA, 1994., After Action Report (USA) 2000. Historical information indicates use as above.

	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?***			Inconclusive

Sources reviewed and comments
grenades may have been used. If the site was used at night then flares may have been used (USAEDH, 1997; USA, 1999).

References:
After Action Report (USA, 2000), Archives Search Report (USACE, 1997)

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 1: LITERATURE REVIEW

	Yes	No	Inconclusive
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?***		No	

Sources reviewed and comments
Housing was constructed in this area between 1957 and 1961.

References:
Grading Plans (USACE, 1959), Photomap (USACE, 1960), Aerial Photograph (1966)

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

Sources reviewed and comments
Area is bordered by the multi-range area to the south, training areas to the east and west (later a golf course to the west) and training areas/development to the north. Training area to the west does not have any OE sites within. Nothing was found in the sampling of Site OE-39 to the north.

References:
1945 Training Map

ESTABLISHMENT OF SITE BOUNDARIES			
6. ***Is there evidence of training areas on aerial photographs that could be used to establish***	Yes		

Sources reviewed and comments
Small disturbed area visible in the vicinity of the ASR site boundary after overlaying the ASR boundary on the 1949 and 1951 aerial photographs. Disturbed areas are also present to the south.

References:
1949 Aerial photograph, 1951 aerial photograph.

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 1: 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
Boundaries are shown on the 1945 and 1946 training maps.

References:
1945 Training Map, 1946 Training Map

	Yes	No	Inconclusive
8. *Should current boundaries be revised?*		No	

Sources reviewed and comments
Site boundaries as established cover the most areas of interest based on historical data. Grid locations outside the site boundaries cover other historical areas of interest.

References:
1945 Training map, 1946 Master Plan, 1949 Aerial Photograph, 1951 Aerial photograph.

RESULTS OF LITERATURE REVIEW

	Yes	No	Inconclusive
Does the literature review provide sufficient evidence to warrant further investigation?			Yes

Comments
Results of the literature review indicate that the site was used as a live grenade range in the 1940s. The results of the boundary review indicate that the boundaries could be extended toward the south, but that the site was located in the area of the current boundaries.

References
USAEDH, 1997. Revised Archives Search Report, Former Fort Ord, California, Monterey County, California. Prepared by US Army Corps of Engineers St. Louis District.
Training Facilities Map, Revised August 1945
Master Plan - Fort Ord, April 5, 1946
Training Areas That Cannot Be Used at the Same Time, Circa 1954
Field training Areas and range Map, April 27, 1964.

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

SAMPLING RESULTS (Items found)

	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
No evidence to suggest that the area was an impact area. Non-impact OE-related scrap items (grenade fragments and pyrotechnic items) found during sampling (USAEDH 1997; Review of Fort Ord facilities and training maps; USA, 2000).

	Yes	No	Inconclusive
2. ***Is there evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?***	Yes		

Sources reviewed and comments
Expended grenade fuzes, pyrotechnics, and fragments of hand grenades were found (USA, 2000).

	Yes	No	Inconclusive
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
Pit with three expended pyrotechnic items was found (USA, 2000).

	Yes	No	Inconclusive
4. ***Was sampling and/or reconnaissance performed within the appropriate area?***	Yes		

Sources reviewed and comments
The four sample grids appear to be in the correct area (USA, 2000). See map.

	Yes	No	Inconclusive
5. ***Does sampling indicate OE and/or ordnance-related scrap are present at the site?***	Yes		

Sources reviewed and comments
OE-related scrap found in three of the four grids completed (USA, 2000).

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: 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
Hand grenade fragments found in three of four grids (USA, 2000).

	Yes	No	Inconclusive
7. ***Were the type(s) of items found consistent with the era(s) in which training was identified?***	Yes		

Sources reviewed and comments
The grenade fragments were consistent with the era that the training took place (USA, 2000).

	Yes	No	Inconclusive
8. ***Was HE fragmentation found?***	Yes		

Sources reviewed and comments
The After Action Report (AAR) indicates MK II fragment was found during sampling (USA, 2000).

	Yes	No	Inconclusive
9. ***Was HE found?***		No	

Sources reviewed and comments
No HE found (USAEDH 1997; USA, 2000).

	Yes	No	Inconclusive
10. ***Were LE found?***		No	

Sources reviewed and comments
Expended pyrotechnics, expended grenade fuzes (USAEDH 1997; USA, 2000).

	Yes	No	Inconclusive
11. ***Were pyrotechnics found?***		No	

Sources reviewed and comments
Only expended pyrotechnics found in a pit (USAEDH 1997; USA, 2000).

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
12. ***Were smoke producing items found?***		No	

Sources reviewed and comments
Expended pyrotechnics. The Navy Day/Night Signal produces smoke for a day signal and a flare for a night signal. (USAEDH 1997; USA, 2000.)

	Yes	No	Inconclusive
13. ***Were explosive items found (e.g. rocket motors with explosive components, fuzes with explosive components)?***		No	

Sources reviewed and comments
Only expended and fragmentation (USAEDH 1997; USA, 2000).

	Yes	No	Inconclusive
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, it is possible that pyrotechnics, smoke producing, and low explosive items (all of which contain energetic materials) were used during training. (USAEDH 1997; USA, 2000).

SITE BOUNDARIES REVIEW

	Yes	No	Inconclusive
15. ***Were items found in a localized area (possibly the remnants of a cleanup action)?***			Inconclusive

Sources reviewed and comments
Expended pyrotechnics were found in a pit (USA, 2000). It is not know if they were buried as part of an earlier cleanup.

	Yes	No	Inconclusive
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
Site was not divided into sectors. The boundaries were established based on historical documentation and site visits *(USA, 2000).*

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
17. ***Should current site boundaries be revised?***		No	

Sources reviewed and comments
Although it is possible that the grenade training site extended to the south of the current site boundaries, sample grids were placed in this area, therefore, the suspect area has been sampled.

EQUIPMENT REVIEW

	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
Schonstedt Model GA/52Cx Magnetometers are capable of detecting the types of items expected at this site. Site was sampled to a depth of 4 feet. Hand grenades would be expected on the surface. Rifle grenades penetrate to a depth of 0.1 feet in sand (USAESCH, 1997). Expended pyrotechnics were detected in a pit, obviously below the depth of penetration of hand grenades.

	Yes	No	Inconclusive
19. ***Was equipment used capable of detecting the types of items (e.g., non-ferrous) suspected at the site?***	Yes		

Sources reviewed and comments
Schonstedt GA-52/Cx was used at this site. Based on the historical review, the items expected at this site are metallic. Non-ferrous items were not expected at this site (USA, 2000).

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
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

Hand grenade (practice) Type I (surface) (0 to 1 foot) items in the ODDS (Parsons, 2001). Instrument listed in the after action report is the Schonstedt GA-52/Cx. Results of the ODDS indicate that the Schonstedt GA-52/Cx is capable of detecting the ferrous OE items expected at this site. A site specific numerical detection rate cannot be calculated for an individual site based on the results of the ODDS.

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 are non-penetrating items. However, if items were buried then confidence level would decrease.

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

Throughout operations at Site OE-24C CMS performed daily operational checks and Quality Control (QC) inspections of its work (USA, 2000)

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive

SAMPLING METHODS REVIEW

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?***

		Inconclusive

Sources reviewed and comments
SiteStats/GridStats was used to design and implement sampling at this site. Subsequent to this work, the use of this program has been questioned. It appears that the data are of good quality; however, it is not possible to statistically evaluate the adequacy of the sampling at this site.

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
48,250 square feet (approximately 1.11 acres) were sampled by CMS based on 4 various sized grids ranging from 100x200-foot (20,000 square feet) to 4,500 square feet. Two of the four grids were established outside of the Site OE-24C boundary due to terrain and structures within the site (USA, 2000). It is not possible to estimate OE density because no OE was found.

Total Area:	48,250 sq. ft.
UXO Density:	Not Calculated

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

Sources reviewed and comments
1850 anomalies identified and 265 sampled or 14% (USA, 2000)

Total % of anomalies investigated:	14%

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
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

QUALITY ASSURANCE/QUALITY CONTROL

	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
The grids which were sampled in Sites OE-24C were not subject to formal Quality Control (QC) inspections because of the nature of the SiteStats/GridStats procedures. Throughout operations at Site OE-24C CMS performed daily operational checks and QC inspections of its work. No deficiency reports were written during inspections of the SiteStats/GridStats sampling work done on this site (USA, 2000). A 100 percent review of the data was completed by Parsons (Appendix A) followed by a 10% QA check by the USACE prior to submittal of the data for use in this review. The methods used to complete this review are documented in Appendix B.

Result of Sampling Evaluation

	Yes	No	Inconclusive
Does the sampling evaluation provide sufficient evidence to warrant further investigation?	Yes		

Comments

ATTACHMENT 24C-A
EVALUATION OF PREVIOUS WORK: SITE OE-24C
EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
Based on the review of existing data, it is not anticipated that UXO would remain at this site; however, because this site was used for live grenade training, the possibility for live grenades to remain buried at this site exists. Additional investigation is recommended for this site.			

References

USA Environmental, Inc., (USA) 2000. After Action Report SiteStats/GridStats OE Sampling, Inland Range Contract, Former Fort Ord, California, Site 24B-E And OE-39. December 30.

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

USA, 2000. Ordnance Detection And Discrimination Study, Seeded Test Technical Memorandum, Former Fort Ord, California, Presidio of Monterey, California. In Cooperation with US Army Corps of Engineers Sacramento District and Parsons Engineering Science, Inc. October 23.

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.

ATTACHMENT 24C-A2

ATTACHMENT 24C-A2

POTENTIAL ORDNANCE USED AT SITE OE-24C

MK II Fragmentation Hand Grenade – The information provided below on the MKII fragmentation grenade is from TM 43-001-29. The MKII fragmentation hand grenade is used to supplement small arms fire against the enemy in close combat. The grenade produces casualties by high velocity projections of fragments.

The MKII grenade is pineapple shaped with deep serration of its body. The serrations delineate fragmentation of the body when the grenade explodes. No safety clip is authorized for use with the grenade. The grenade body is cast iron and contains a high explosive filler. Grenade fuzes M204A1 and M204A2 are pyrotechnic delay-detonating fuzes. They differ only in body construction. The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, and detonator assembly. The split end of the safety pin has an angular spread or diamond crimp.

Removal of the safety pin permits release of the safety lever. When the safety lever is released. It is forced away from the grenade body by a striker acting under the force of a striker spring. The striker rotates on its axis and strikes the percussion primer. The primer emits a small, intense spit of flame, igniting the delay element. The delay element burns for 4 to 5 seconds, then sets off the detonator. The detonator explodes, thus initiating the explosive charge. The explosive charge explodes, rupturing the body and projecting fragments.