

GROUP 3

Parcel L23.5.2

Portion of FBTA

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FIGURE (IN TEXT)

G3-1	Booby Trap Firing Devices and Related Components
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ATTACHMENT

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4.0 GROUP 3 - PARCEL L23.5.2 (PORTION OF FBTA)

A summary report for Parcel L23.5.2 is provided below. This report consists of two parts. The first part, contained in Sections 4.1 through 4.5, 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 munitions and explosives of concern (MEC) 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 4.6). 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 4.6.1) and evaluation of the site walk process (Section 4.6.2). These discussions are based upon information from standardized literature review and site walk review checklists (Attachment G3-1). Section 4.7 provides conclusions and recommendations for the site. References are provided in Section 4.8.

4.1 Site Description

Parcel L23.5.2 (portion of FBTA) is located in the west-central portion of the former Fort Ord, and is comprised of approximately 14 acres west of munitions response site (MRS)-50 EXP and east of MRS-49 and Welch Ridge (Plate G3-1). The boundary of L23.5.2 is based on reuse property boundaries and not on a currently identified munitions response site boundary. The majority of Parcel L23.5.2 lies within an area labeled on a 1956 training facility map as "FBTA". A copy of the map showing the FBTA (possibly Field Battalion Training Area or Firing Battery Training Area) was included in the Fort Ord Archives Search Report (ASR; *U.S. Army Engineer Division, Huntsville [USAEDH], 1997*). At the time the ASR was written, the FBTA was not identified as a site requiring investigation and was therefore not given a formal site name. Because of its proximity to MRS-50 EXP which, during a removal action was found to contain military munitions, and because training at a FBTA could have included the use of military munitions, Parcel L23.5.2 was investigated and has been identified as a Track 1 plug-in candidate site.

4.2 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 MACTEC. 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 Era

Parcel L23.5.2 lies within a tract of land purchased from private landowners by the government in 1917 (*Arthur D. Little, Inc., [ADL], 1994*). Documentation for use of this area by the Army for training prior to 1940 is limited to topographic maps. Topographic maps of the area from 1918 (*Department of Interior [DOI], 1918*) and 1933 (*Army, 1933-34*) were reviewed. Welch Ridge, Parker Flats, and Eucalyptus Road are shown on the 1933 topographic map; general features appear consistent with present day maps. No further identifiable features or labels were associated with this area.

1940s Era

Review of 1940s era documentation including historical maps and aerial photographs indicates no specific training sites were in use in the area. The ridge located west of the future FBTA is referred to as Welch Ridge. The results of the historical map and aerial photograph review for the 1940s are summarized as follows:

- An aerial photograph from 1941 shows no features or disturbed areas within the site boundary.
- The 1945 and 1946 training maps show no features or training sites within Parcel L23.5.2 (*Army, 1945 and 1946*).

1950s Era

Review of 1950s era documentation, which included training maps and aerial photographs, indicated some training areas were established, but no indication of live fire training is evident. The 1950s-era aerial photographs show the first buildings in the vicinity, the Officers' Quarters, which is located immediately southwest of the Parcel L23.5.2 boundary, and the appearance of the FBTA, which is roughly coincident with the parcel. The results of the historical map and aerial photograph review for the 1950s are summarized as follows:

- Clearings and areas of disturbed ground, including erosional features on the side of Welch Ridge are evident on a 1951 and on a 1956 aerial photograph (Plate G3-2).
- The 1956 aerial photograph shows that four Officers' Quarters buildings have been constructed on Welch Ridge. An area east of the Officers' Club appears to have been graded for construction.
- An area labeled FBTA ("Field Battalion" or "Firing Battery" Training Area) on a 1956 training map is located between the Officers Quarters and a road labeled Parker Flats Cutoff (*Army, 1956*).
- The circa 1953 and 1956 training maps show the "Welch Ridge Bleachers". The bleachers are not evident on the aerial photos and their mapped location is outside the footprint of the FBTA (*Army, 1954, 1956*).
- The area labeled FBTA is not shown on a 1957 training map (*Army, 1957*).

1960s Era to Present

The Fitch Park military housing, less than 1,500 feet southwest of the FBTA (Parcel 23.5.2), was constructed in the late 1950s and early 1960s and was occupied from then to the present. The housing development first appears on the 1964 training map as the East Officer's Housing Area (*Army, 1964*). The results of the aerial photograph and map review are summarized as follows:

- The area labeled FBTA on the 1956 training map is no longer present on 1960's-era maps.
- The 1966 aerial photograph shows that the Officers' Quarters have expanded, with three more buildings constructed approximately 1,500 feet west of the former FBTA footprint. The photograph also shows that George C. Marshall Elementary School and the Marshall Park housing area have been built to the northwest and to the north of the parcel, respectively (Plate G3-3). The disturbed areas evident on the 1951 aerial photograph are now covered by vegetation.

- Available aerial photos from 1991 to 2003 show that the parcel has become heavily vegetated on western two-thirds, with lighter vegetation on the eastern one-third. Records state that the Officer's Club (now Chartwell School) west of the parcel was built in 1971 (Plate G3-4).

Proposed Future Land Use

Parcel L23.5.2 is proposed for development.

4.3 Potential Ordnance Based on Historical Use of the Area

The acronym FBTA could possibly mean Field Battalion Training Area, or Firing Battery Training Area (Hall, 2005). No specific training information such as standard operating procedures (SOPs) have been identified for the FBTA. A training area of this type was commonly used by artillery units to train personnel in techniques to select, setup, camouflage, defend, and operate an artillery position (Hall, 2005). Activities performed at a site of this type might include transporting artillery equipment, practice loading and aiming of artillery with training (inert) ordnance, establishing perimeter security, and defending an artillery position. Munitions-related items that might have been used at a FBTA include inert artillery training ordnance, blank small arms ammunition, practice mines, booby traps, artillery simulators, and pyrotechnics such as trip flares and smoke grenades. Blank artillery ammunition (no projectile) is used in some instances, but was not likely in this area because of the adjacent Officers Quarters. Live fire was not allowed at training areas of this type (Hall, 2005). Additional information on some of the models of practice mines, booby traps, artillery simulators, and pyrotechnics potentially used as part of the operation of the FBTA is provided in Attachment G3-2.

The potential use of high explosive (HE) military munitions in this area was considered during the evaluation of Parcel L23.5.2 (FBTA). However, based on the following reasons it is believed HE munitions were not used at the site because: (1) no range fan (typically associated with live fire ranges) is delineated in this area on available training maps; (2) a review of aerial photographs does not indicate the presence of firing points or targets within this site; and (3) the Officer's Quarters and "Welch Ridge Bleachers" were present and in such close proximity to the FBTA that live fire would not be compatible with the area.

4.4 History of MEC Investigations

The following describes the MEC investigations that have been conducted at Parcel L23.5.2 (FBTA).

1997 Revised Archives Search Report (ASR)

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 U.S. Army Corps of Engineers guidance (USACE, 1995). The archives search included a Preliminary Assessment/Site Investigation (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. Requirements for preparation of an ASR are described in Section 2.0 of the Track 1 Ordnance and Explosives (OE) Remedial Investigation/Feasibility Study (RI/FS) report (MACTEC, 2004).

The FBTA was shown on maps contained in the ASR, but it was not identified as an area requiring investigation at that time.

2005 Site Walk

A site walk was conducted by a Parsons team at Parcel L23.5.2 (portion of the FBTA) on August 24, 2005. The site walk was performed to address regulatory agency concerns regarding the potential for MEC to exist on Parcel L23.5.2 because of its proximity to MRS-50 EXP, where MEC had been found during removal actions. The site walk was conducted by a three-person team, which included a UXO QC person, one UXO technician, and one geophysicist. The walk was performed in accessible areas and was investigated using an EM61 MKII geophysical instrument. The path and anomaly locations were recorded using a Leica Global Positioning System (GPS) unit. A total of fifteen metallic anomalies were identified and investigated. Thirteen of the fifteen anomalies were determined to be cultural debris (CD), one was identified as munitions debris (MD; an empty M1 ammunition clip), and one anomaly was identified as expended munitions debris (MD-E; a tail boom from an illumination mortar) that appeared to have been discarded in the area. It should be noted that the two foxholes identified as anomalies were recorded as such for convenience and were not geophysical anomalies. Details of the site walk are included in Attachment G3-2 of this report.

4.5 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 MEC 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 MEC), and exposure routes (potential scenarios that may result in contact with MEC).

The CSM for Parcel L23.5.2 is based on currently available site-specific and general information including a literature review, review of aerial photographs, training maps, technical manuals, field observations, and interviews. It is provided to help formulate an understanding of the use of the site and to identify potential release and exposure pathways. Plate G3-5 presents a conceptual site model.

4.5.1 Training Practices

Training practices are discussed below to provide information of the types of military munitions that may have been used at the site.

As mentioned in Section 4.3, a Field Battalion Training Area, or Firing Battery Training Area is commonly used by artillery units to train personnel in techniques to select, setup, camouflage, defend, and operate an artillery position. The activities include any operations an artillery unit might implement such as transporting equipment, practicing loading and aiming weaponry, and defending an artillery position. Munitions-related items that might be used at a FBTA include inert artillery training ordnance, blank small arms ammunition, practice mines, booby traps, artillery simulators, and pyrotechnics such as trip flares and smoke grenades. Blank artillery ammunition (no projectile) is used in some instances, but was not likely in this area because of the adjacent Officers Quarters. Live fire was not allowed at training areas of this type (*Hall, 2005*).

4.5.2 Site Features

Parcel L23.5.2 and the surrounding area is predominantly oak woodland. It is situated within a topographic low between Welch Ridge to the southwest and Artillery Hill to the northeast. The Officers' Quarters and the Chartwell School are located just outside the southwestern site boundary. The Fitch Park housing area is also to the southwest.

4.5.3 Potential Sources and Location of MEC

Based on the review of historical data, MEC that may be present at Parcel L23.5.2 would include non-fired items such as simulators, booby trap components, flares, and signals. The only evidence of a munitions-related item at the parcel was a single tail boom from a 60mm illumination mortar, which appeared to have been discarded there and was categorized as expended munitions debris. As previously described in Section 4.1, MRS-50EXP lies adjacent to Parcel L23.5 (Plate G3-2). MRS-50EXP was not initially identified as a MRS in the ASR, but was created due to the expansion of the removal area associated with MRS-50. MEC and munitions debris were found at the boundary of MRS-50, which warranted an expansion of the investigation area in all directions. The investigation of MRS-50 and its expansion areas included a removal action conducted over the entire site to a depth of 4 feet. During the removal, four hundred and twenty-five MEC items were found and removed from MRS-50EXP. However, the majority of these items were non-penetrating (e.g., pyrotechnics, grenades, and grenade and projectile fuzes). No high explosive or penetrating military munitions were found within 400 feet of the parcel. The MEC and munitions debris found within the grids closest to the parcel were pyrotechnic and practice type items (i.e., signals, grenade fuzes, and a grenade cartridge).

4.5.4 Potential Exposure Routes

This site is mostly within land that is undeveloped. The site is adjacent to the Chartwell School, near Fitch Park and Marshall Park housing areas and the George C. Marshall Elementary School, and is accessible to the public. Because no MEC was discovered during the site walk or reported previously, MEC is not expected in this area. However, because the site was not 100% investigated, the possibility exists (although unlikely) that future construction workers could come into contact with MEC.

Although no MEC items were found at Parcel L23.5.2, a brief discussion of the potential injuries that could result from contact with live MEC possibly used at a Field Battalion or Firing Battery Training Area are provided below. For each of the MEC 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.

Antipersonnel Practice Mines (M8, M8A1) and Fuzes (M10, M10A1). Mines, antipersonnel, practice, M8 and M8A1 were designed to simulate the M2 (bounding) series of antipersonnel mines. They were used for training in the proper methods and precautions to be observed in the care, handling, laying, booby-trapping, arming and disarming of the M2 and M15 series mines. The fuze firing mechanism is activated by applying pressure (8 to 20 pounds) on any of the three prongs on the M10 or M10A1 combination fuze, or a pull of 3 to 10 pounds of pressure on the trip wire. The fuze firing train ignites the delay element in the projectile, and also propels it about 2 meters into the air. The delay initiates the spotting charge, which explodes with a loud report and emits smoke. The M8A1 mine with the M10A2 fuze functions the same except that the fuze firing train ignites the yellow smoke pellets through a 4 to 5 second delay, expels a plastic plug into the air allowing the yellow smoke to be emitted from the top of the container (*Army, 1977c*). Assuming that a mine was left emplaced and armed, and that it survived many years of degradation from exposure, it could be functioned by incidental contact by applying sufficient pressure to any of the prongs or trip wire on the M10, M10A1, or M10A2 combination fuze by stepping upon the fuze or tripping on the trip wire. If caused to function, the type of injury that could be sustained from the M8 mine would be burns from the 170-grain black powder spotting charge, and possible injury from falling parts. If caused to function, the M8A1 would propel a plastic plug into the air allowing yellow smoke to be emitted from the container. Because the spotting charge is black powder, it may still be capable of functioning if it dries out after being exposed to moisture.

Summary: It is unlikely that a person would be able to trigger the practice antipersonnel mine through casual (inadvertent or unintentional) contact if one were found at the site and be burned or exposed to smoke or falling parts, because the mine: (1) would have to contain a live fuze, and (2) these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Antitank Practice Light Mine M10, and Fuze M604. The M10 antitank practice mine consists of a rectangular steel container that is loaded with sand in the field. According to Headquarters Munitions Command data cards, the M10 antitank practice mine was produced between 1946 and 1947. A primary fuze well for the practice fuze is located in the top center of the mine. The fuze (M604) is designed for use in the M10, M12, M12A1, and the M20 antitank practice mines. It is an instantaneous, mechanical, pressure-activated type fuze consisting of a steel body containing the firing pin assembly, cover assembly, primer and smoke charge, and a safety fork. The fuze is issued separately and assembled to the mine in the field. After it is fired and the mine is recovered, a new fuze can be installed and the mine reused. The smoke charge is contained in the fuze. The M10 practice mine can be booby trapped with a regular firing device threaded directly into the secondary fuze well. Functioning of the fuze ignites a smoke charge that emits a cloud of smoke and creates a noise. When booby trapped, the mine is activated by a pull wire (*Army, 1977a, b*).

Summary: It is highly unlikely that a person would be able to trigger a practice antitank mine through casual (inadvertent or unintentional) contact if one were found at the site and be exposed to smoke and noise, because the mine: (1) would have to contain a live practice fuze and active practice detonator, (2) was designed to be triggered by the weight of a vehicle, and (3) these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Antitank Practice Mines (M12, M12A1, M20) and Fuzes (M604). The fuze, mine, antitank, practice (M604) is designed for use in the M12, M12A1, and the M20 antitank practice mines. The fuze is an instantaneous, mechanical, pressure-activated type fuze consisting of a steel body containing the firing pin assembly, cover assembly, primer and smoke charge, and a safety fork. The fuze is issued separately and assembled to the mine in the field. After it is fired and the mine is recovered a new fuze can be installed and the mine reused. A minimum force of 140 to 240 pounds depressed the pressure plate that caused the Belleville spring to snap into reverse, driving the firing pin into the primer. The primer ignites the smoke composition, which flashes emitting a cloud of smoke and creating a noise. The primer contains 1.62 grains of primary explosive and 2.96 grains of black powder, and the smoke composition weighs 262.3 grains or 0.6 ounces (*Army, 1977c*). The mine was designed to be triggered by the weight of a vehicle, and would require more weight than a large person can apply by just stepping on the pressure plate to trigger it. If caused to function, the type of injuries that could be sustained would be a burn injury from the 262.3 grains of smoke composition.

Summary: It is highly unlikely that a person would be able to trigger a fuze through casual (inadvertent or unintentional) contact if one were found at the site and sustain a burn injury, because the fuze: (1) was designed to be triggered by the weight of a vehicle, 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.

Antitank Practice Mines (M1, M1A1) and Fuzes (M1A1, M1A2). The mine, antitank, practice M1 and M1A1 was designated to simulate the M1 and M1A1 HE antitank mines. The M1 series practice mine may be used with the M1A1 or the M1A2 practice mine fuzes or the M1 dummy mine fuze, which is inert. They were used for training in the proper methods and precautions to be observed in the care, handling, laying, boobytrapping, arming and disarming of the M1 and M1A1 antitank mines. The mine is

functioned by applying pressure (200 to 500 pounds) to the pressure plate, which causes the fuze to initiate the firing sequence. The mine may also be functioned using the Activator, Antitank Mine: Practice, MI by assembling the activator to a firing device and inserting the assembly in a secondary fuze well in the mine (Hall, 2005). The activator operates when the action of a firing device initiates the igniter charge, which in turn, ignites the smoke charge, releasing a puff of white smoke with accompanying noise (Army, 1977c). The mine could be caused to function by incidental contact by applying sufficient force to the pressure plate of the mine. The mine, being antitank by type, requires more weight than a large person can apply by just stepping on the pressure plate. It would normally require a vehicle to generate the necessary pressure to activate the fuze.

Summary: It is highly unlikely that a person would be able to trigger a practice antitank mine through casual (inadvertent or unintentional) contact if one were found at the site and be exposed to smoke and noise, because the mine: (1) would have to contain a live practice fuze and active practice detonator, (2) was designed to be triggered by the weight of a vehicle, and (3) these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Booby Trap Firing Devices. The firing devices shown in the table below are all issued with a coupling base firing device consisting of a metal or plastic body and an internal percussion primer (similar to the primer in a small arms cartridge), and are designed to be used to set up booby-traps. They could also be used as a secondary firing device (booby-trap) for most anti-personnel and antitank mines. The firing devices could be set up to fire by pressure on the device if a trip wire was pulled, pressure was released as in a weight being removed, or if a line under tension were cut. In each case, triggering the device would cause the spring-loaded firing pin to strike the percussion primer initiating the explosive train. As these items were used in training, no high explosives were used. The percussion primer provided sufficient noise to denote a detonation for training (Army, 1994). It is unlikely that a set up booby trap, which includes one or more of the above firing devices, would remain in operational condition after many years of exposure. These devices are not sealed units. They are designed to be set up in the field quickly to provide temporary area denial or separation of forces. Many booby trap firing devices require trip wires to activate them, which are composed of a thin wire that will not survive long exposure to the elements. The firing devices themselves are not sealed to protect them from exposure to the environment. In the unlikely event that one of these armed devices were made to function, they would likely produce a shock, noise, and flash. They are not likely to cause injury by themselves.

Figure G3-1. Booby Trap Firing Devices and Related Components

Nomenclature	Type by function	Lbs. Required to function
Firing Device, M1	Pull	3 to 5
Firing Device, M1	Pressure Release	3
Firing Device, M1 and M1A1	Pressure	20
Firing Device, M1	Chemical Delay	6 to 1130 minute delay
Firing Device, M3	Pull or Release	6 to 10 of Pull & any release of tension
Firing Device, M5	Pressure Release	Approx. 5

Nomenclature	Type by function	Lbs. Required to function
Coupling Base, Firing Device, M2	Non-metallic	NA
Coupling Base, Firing Device	Metallic	NA
Activator, Antitank Mine, Practice M1	Triggered by firing device	NA

Summary: It is unlikely that a person through casual (inadvertent or unintentional) contact could cause an armed booby trap firing device fitted with a coupling base to function if one were found at the site, and be exposed to the shock, noise, and flash of the coupling base. Booby trap firing devices were designed to be functioned by a thin trip wire, pressure, or release of pressure that would release a cocked spring loaded firing pin. These small, unsealed, metal parts have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Simulator, Explosive Booby-trap: Flash, M117; Illuminating, M118; Whistling, M119. The booby trap simulators are designed to be used as safe booby traps during maneuvers and in troop training to teach the installation, detection and use of booby traps, and to instill caution in troops exposed to traps set by an enemy. They consist of a cylindrical outer tube (made of Kraft paper), and a flat metal nailing bracket extending from one end of the tube. Located within the outer tube are an initiating charge assembly and an inner tube containing a pyrotechnic charge. Running through the initiating assembly is a length of pull cord. One end of the cord is covered with a friction composition, the other end is coiled and a strip of tape. The M117 simulator has a dimple in the mounting bracket for additional identification at night. Issued with each simulator is a spool of trip wire, an extension spring, three staples, and four nails for booby trap installation. They are nailed against trees with a trip wire attached to the pull cord. It is functioned when a soldier applies pressure to the trip wire, pulling the cord through the ignition composition assembly, which produces a flash. The flash is transmitted through a flash tube, which ignites the pyrotechnic charge (*Army, 1977a*). It is unlikely that a paper-bodied simulator would survive years of exposure in the field. In the unlikely event that an unfired simulator was discovered and functioned, the type of injuries that would be sustained would be burns and lacerations to the hand from the exploding pyrotechnic charge, if it was being held when it functioned.

Summary: It is unlikely that a person could cause a booby trap simulator to function through casual (inadvertent or unintentional) contact if one were found at the site and be burned or lacerated, because it was made from paper that would have been exposed to moisture, degradation, and weathering for many years, which could decrease its effectiveness.

Simulator, Projectile Ground Burst, M115A2. This pyrotechnic device is used to simulate battle noises and effects (shell in flight and ground explosions) during troop maneuvers. A common use of the item would have been to simulate counterfire from an opposing artillery position. The body consists of a cylindrical paper tube containing a photoflash charge and a whistle assembly. The fuse lighter is a friction-type and is taped to the outside of the simulator. The simulator functions using a pull cord which ignites the safety fuse. The whistle compositions burns for approximately 2 to 4 seconds, followed by the ignition of the photoflash charge, producing a flash and a loud report.

Summary: It is unlikely that a person could cause an artillery simulator to function through casual (inadvertent or unintentional) contact if one were found at the site and be burned or lacerated, because it

was made from paper that would have been exposed to moisture, degradation, and weathering for many years, which could decrease its effectiveness.

M48, Parachute Trip Flare. This pyrotechnic device is designed to project a parachute-suspended flare to detect infiltrating troops. The flare consists of a hollowed steel base with a 2.5-inch diameter, 7.3-inch long tube extending upward, with a smaller 3/8-inch diameter 5-inch long tube adjacent to it, which is threaded to accommodate a M6A1 mine fuze that is shipped with the flare. The fuze is functioned by a pressure of 10 to 12 pounds on the prongs on its head, or by a pull of 6 to 10 pounds on the release pin. When the firing pin hits the primer, a flame sets off a relay charge, which carries the flame to the propelling charge. The propelling charge propels the flare assembly upward and simultaneously ignites the 3-second delay fuze. When the delay fuze burns through, it ignites the expelling charge, which expels the flare and parachute and ignites the quickmatch. The quickmatch ignites a priming charge that sets off the first-fire composition that ignites the pyrotechnic candle, which is suspended by the parachute (*Navy, 2001*).

Summary: It is possible that a person could cause the parachute trip flare to function through casual (inadvertent or unintentional) contact if one remained in a “prepared to function” condition (e.g., fuze was installed in the flare, was armed, and attached to a trip wire or other triggering mechanism, or placed in the ground with the prongs exposed). Upon functioning, injury such as minor to serious burns could occur from the ignitable components, or by being struck by the ejecting flare and parachute assembly. If the fuze is not installed, the parachute trip flare would not function through casual (inadvertent or unintentional) contact but could function if exposed to heat or flame.

M49A1, Surface Trip Flare. This pyrotechnic device is designed to give warning of infiltrating troops by illuminating the field of the advancing enemy. The trip flare consists of an illuminant assembly, cover loading assembly, and mounting bracket. The illuminant assembly is in an aluminum case containing an ignition increment and three illumination increments. The waterproof cover loading assembly holds a percussion primer, intermediate charge, and a springloaded striker. A pull on the trip wire causes either the trigger tongue or pull pin to release the lever, which causes the firing pin to strike the primer. The primer sets off the intermediate charge, which ignites the first-fire composition on the ignition increment of the flare (*Army, 1977a*).

Summary: It is possible that a person could cause the surface trip flare to function through casual (inadvertent or unintentional) contact if one remained in a “prepared to function” condition (e.g., attached to a trip wire or other triggering mechanism). If it existed in a fixed position (e.g., attached to a tree), serious injury beyond burns would not be expected because the flare is designed to burn “in place” where it was placed or mounted. If one was in a “prepared to function” condition and left on the ground, it could function upon casual (inadvertent or unintentional) contact, but it would burn in a manner similar to a road flare, but with greater heat and illumination and could cause burns.

Grenade, Hand, Smoke, M18. The M18 is a colored smoke hand grenade used for ground to air or ground to ground signaling. The grenades may be filled with any one of four smoke colors: red, green, yellow, or violet. Each grenade will emit smoke for 50 to 90 seconds. The grenade body is of thin sheet metal and is filled with smoke composition and topped with a starter mixture. The hand grenade fuze M201A1 is a pyrotechnic delay igniting fuze. The body contains a primer, first-fire mixture, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever, and safety pin with pull ring. The grenade weighs 19 ounces and contains 11.5 ounces of smoke composition. It was functioned when a soldier removed the safety pin from the safety lever and threw the grenade allowing the safety lever to fly free, releasing the spring-loaded striker to strike the primer. The percussion primer ignited the first fire mixture. The fuze delay element, which burns for 0.7 to 2 seconds, ignition mixture, and grenade starter mixture and filler, are ignited by the preceding

component. The pressure sensitive tape is blown off the emission holes from which the colored smoke emits (*Army, 1977b*). Assuming an M18 smoke grenade was discovered in an unfired condition and caused to function, the type of injuries that could be sustained would be burns from the burning smoke composition. Due to the heat generated, it is unlikely that a person who found a grenade and caused it to function would hold onto it after ignition. Given that these items have been exposed to the elements for many years, moisture can penetrate and degrade the pressure sensitive tape, the smoke composition, and the condition of the sheet metal case of the grenade.

Summary: It is possible that a person could cause the smoke grenade to function if one were found at the site and be burned, but it 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.

4.6 Site Evaluation

The available data (e.g., archival and site walk data) regarding Parcel L23.5.2 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 G3-1. This section presents a summary of the results of the checklist evaluation and is divided into two sections; an assessment of the literature review and an assessment of the site walk performed at the site.

4.6.1 Literature Review

Type of Training and MEC Expected

Archival information indicates this area was used as a Field Battalion or Firing Battery Training Area (FBTA). The available information also indicates that the FBTA was present from sometime after 1953 but no later than 1956 (*Army, 1954 and 1957*). Specific details regarding how this area was used at Fort Ord are not available. However, general training activities in a FBTA commonly include instructing artillery units in techniques to select, setup, camouflage, defend, and operate an artillery position (*Hall, 2005*).

Development and Subsequent Use

There has not been any subsequent use or development of this area. Housing, two schools, and an Officers' Quarters have been constructed in the vicinity, but none of these structures are located within Parcel L23.5.2.

Establishment of Site Boundaries

The boundary of Parcel L23.5.2 defines the extent of the site as it pertains to the Track 1 plug-in process and is based on property reuse boundaries established after base closure. The aerial photographs from the early 1940s through the 1990s show no clear indication of a defined FBTA, but its position on the 1956 training facility map is largely coincident with the parcel footprint. With the possible exception of the "Welch Ridge Bleachers" (outside of the FBTA footprint), no structures or permanent features associated with suspected training activity are evident.

Summary of Literature Review Analysis

The majority of available documentation regarding the FBTA consists of aerial photographs, maps, and interviews. A review of Fort Ord-specific documentation including training facilities maps and plans and

aerial photographs provide no indication that this area was used to support live fire. The interpretation of the area as dry-fire training is supported by potential safety concerns that would have existed because of the nearby housing for military personnel. Discussions regarding training that would have occurred in a FBTA suggest that military munitions such as practice mines, boobytraps, tripflares, blank small arms ammunition, and smoke grenades could have been used at the site. On the basis of the literature review no further MEC-related investigation is warranted.

4.6.2 Site Walk Review

As discussed in Section 4.4, a site walk was conducted by a Parsons team at Parcel L23.5.2 (portion of the FBTA) on August 24, 2005. The site walk was performed to address regulatory agency concerns regarding the potential for MEC to exist on Parcel L23.5.2 because of its proximity to MRS-50 EXP, where MEC had been found during removal actions. The site walk was conducted by a three-person team, which included a UXO QC person, one UXO technician, and one geophysicist. The walk was performed in accessible areas and was investigated using an EM61 MKII geophysical instrument. The path and anomaly locations were recorded using a Leica Global Positioning System (GPS) unit. All anomalies were intrusively investigated. The goals of the site walk were identified by the Army, USACE, and regulatory agencies to address the need for additional data regarding the site. The site walk was performed according to general practices described in the munitions response program Programmatic Work Plan (PWP; *Parsons, 2004*). Only two munitions debris items were found during the site walk, a tail boom from an illumination mortar and a single empty ammunition clip for an M1 rifle. It was the opinion of the UXO QC person that the mortar tail boom had been discarded at this location and did not indicate that this area was used as a military munitions range. Additionally, the presence of a single empty ammunition clip does not necessarily indicate that training with military munitions occurred at this location. Details of the site walk are included in Attachment G3-2 of this report.

Site Boundaries Review

Through the literature review, a general area of concern was identified from a 1956 training facility map (*Army, 1956*). The boundary of the site addressed in this approval memorandum is based on the property boundary established for Parcel L23.5.2. No basis for modifying the boundary has been identified.

4.7 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, interviews and the site walk performed at the site.

4.7.1 Conclusions

Site Use and Development

- Parcel L23.5.2 (portion of FBTA) was identified as a Field Battalion or Firing Battery Training Area on a 1956 training facility map. Based on available information, it appears to have existed from approximately 1954 to 1956. The actual existence of the training area cannot be confirmed through review of other available documentation, photographs, or the site walk. Based on interviews, it is possible that military munitions such as practice mines, boobytraps, blank small arms ammunition, and pyrotechnics could have been used within the site. However, with the exception of a single empty ammunition clip, there was no evidence found during the site walk to support the use of military munitions. Although the empty ammunition clip may be present due to training, its presence does not definitively indicate that training with military munitions occurred on Parcel L23.5.2.

- No evidence of high explosive or penetrating military munitions were found within the removal grids at MRS-50EXP that are adjacent to Parcel L23.5.2.
- The items found within the MRS-50EXP removal grids adjacent to Parker Flats Cut-off (bordering the eastern edge of Parcel L23.5.2) included two practice grenade fuzes (MEC) and three expended signals. The practice grenade fuzes were found adjacent to Parker Flats Cut-off and were probably discarded items. The presence of discarded grenade fuzes is common along roads throughout the Parker Flats Munitions Response Area.
- This area is proposed for future development.

Site Walk Evaluation

- Based on evidence from the literature review and from the site walk, during which geophysical anomalies were intrusively investigated, no additional investigation is necessary.
- The data collected and observations made by the UXO QC person are useful because no MEC and only two munitions debris items were found during the site walk (a tail boom from an illumination mortar and a single empty ammunition clip for an M1 rifle), supporting the conclusion that no further MEC-related investigation is necessary at Parcel L23.5.2.
- Although the site walk conducted at Parcel L23.5.2 did not include walking the entire site, the quantity and quality of the information generated is sufficient to make an informed decision regarding the site. The investigation (site walk) was sufficient to assess the potential presence of MEC or MD. Additionally, the MEC potentially remaining at Parcel L23.5.2 pose an acceptable risk if encountered.
- Based on available information regarding the site, it is unlikely that MEC is present at the site. However, if items expected to have been used during past training remain at the site, they are considered to pose an acceptable risk if encountered because: (1) some of the items would require assembly of components to function, and (2) injuries would likely be limited to minor to serious burns, lacerations, or being struck by ejecting parts (i.e., expected to be non-lethal).

4.7.2 Recommendations

Based on review of existing information, MEC is not expected to be found at Parcel L23.5.2, and no Further Action related to MEC is required for this parcel. Parcel L23.5.2 meets the Track 1 Category 3 criteria. Although an empty M1 ammunition clip was found during a field investigation its presence does not necessarily indicate that training involving military munitions occurred on this parcel. If training did occur, historical research indicates that only practice and pyrotechnic items, that are not designed to cause injury, would have been used in the FBTA. MEC items that may be present on the parcel based on past site use likely consist of practice mines, boobytraps, and pyrotechnics. In the unlikely event that a MEC item is found of the type possibly used at the FBTA, it is not expected that it could be caused to function through casual contact (i.e., inadvertent and unintentional contact). The MEC types potentially present at Parcel L23.5.2 have been exposed to moisture, degradation, and weathering for many years which could prevent many of them from functioning.

For Parcel L23.5.2, digging or underground "intrusive" activities are planned for the proposed site reuse and development. No actionable risk was identified through the remedial investigation process. However, in the interest of safety, reasonable and prudent precautions should be taken when conducting intrusive operations at this site. As a basewide effort to promote safety and because of Fort Ord's history as a military base, the Army provides "ordnance recognition and safety training" to anyone who requests

that training. Construction personnel involved in intrusive operations at the former Fort Ord may attend the Army's "ordnance recognition and safety training" to increase their awareness of and ability to identify MEC items. Section 1.3.1 (Description of the Remedy) of the Track 1 ROD (*Army, 2005a*) describes the scope of the safety training. If MEC is discovered during future development activities on Parcel L23.5.2, trained construction personnel should immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and should not attempt to disturb, remove or destroy the MEC item, but should immediately notify the local law enforcement agency having jurisdiction on the parcel. The local law enforcement agency will arrange for an appropriate agency (e.g., an EOD unit) to respond.

For this parcel, the Army recommends construction personnel involved in intrusive operations attend the Army's ordnance recognition and safety training. The Army will request notice from future landowners of planned intrusive activities, and in turn will provide ordnance recognition and safety training to construction personnel prior to the start of intrusive work. The Army will provide ordnance recognition and safety refresher training as appropriate. Parcel L23.5.2 should be added to the list of Track 1 sites with management controls shown in the *Munitions Response Site (MRS) Security Program (Army, 2005b)*. This document presents the elements of the ordnance recognition and safety training, notification procedures, and Army and local law enforcement responsibilities. In accordance with the Track 1 ROD (*Army, 2005a*), the Army will assess whether the education program should continue. If information indicates that no MEC items have been found in the course of development or redevelopment of the site, it is expected that the education program may, with the concurrence of the regulatory agencies, be discontinued, subject to reinstatement if a MEC item is encountered in the future.

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