DRAFT
SITE-SPECIFIC WORK PLAN
MUNITIONS AND EXPLOSIVES OF CONCERN
REMEDIAL ACTION BLM AREA B
Former Fort Ord, California

May 2017
Draft

Prepared for

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Acronyms

Acronym	Definition
AFB	Air Force Base
APP	Accident Prevention Plan
Army	United States Department of the Army
ASR	Archive Search Report
BCT	BRAC Cleanup Team
bgs	below ground surface
BLM	Bureau of Land Management
BO	Biological Opinion
BRAC	Base Realignment and Closure
CAR	Corrective Action Request
cm	centimeter
CMC	central maritime chaparral
CQCSM	Contract Quality Control Systems Manager
CTS	California tiger salamander
CWM	Chemical Warfare Material
DDESB	Department of Defense Explosives Safety Board
DFW	Definable Features of Work
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munitions
DoD	Department of Defense
EOD	Explosive Ordnance Disposal
EP	Engineering Pamphlet
EM	Engineering Manual
ESS	Explosives Safety Submission
ESTCP	Environmental Security Technology Certification Program
FE	Federal Endangered
FORA	Fort Ord Reuse Authority
FT	Federal Threatened
FWV	Field Work Variance
GIP	Geophysical Investigation Plan
GIS	Geographic Information System
GPO	Geophysical Prove-Out
GPS	Global Positioning System
GSV	Geophysical System Verification
HE	High Explosive
HMP	Habitat Management Plan
ISO	Industry Standard Objects
IVS	Instrument Verification Strip
KEMRON	KEMRON Environmental Services, Inc.
LUC	Land Use Controls
m	meter
MD	munitions debris
MDEH	Material Documented as an Explosive Hazard
MEC	Munitions and Explosives of Concern
MGFD	Munition with the Greatest Fragmentation Distance
mm	millimeter
MPPEH	Material Potentially Presenting an Explosive Hazard

Acronym	Definition
MQO	Measurement Quality Objective
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
MSD	Minimum Separation Distance
mV	millivolt
NAEVA	NAEVA Geophysics
NRL	Naval Research Laboratory
NRMA	Natural Resource Management Area
ODDS	Ordnance Detection and Discrimination Study
OESS	Ordnance and Explosives Safety Specialist
Parsons	Parsons, Inc.
PM	Project Manager
POMFD	Presidio of Monterey Fire Department
PWS	Performance Work Structure
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RACR	Remedial Action Completion Report
RAR	Remedial Action Report
RCWM	Recovered Chemical Warfare Material
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Revolutions per Minute
RRD	Range-Related Debris
RTK	Real Time Kinematic
RWA	Remedial Work Areas
Shaw	Shaw Environmental, Inc.
SOP	Standard Operating Procedures
SSWP	Site-Specific Work Plan
ST	State Threatened
SUXOS	Senior Unexploded Ordnance Supervisor
TM	Technical Memorandum
TIP	Technical Information Paper
TOI	Target of Interest
TP	Technical Paper
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
WERS	Worldwide Environmental Remediation Services

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SECTION 1 INTRODUCTION

This Site-Specific Work Plan (SSWP) outlines the site-specific procedures for a Munitions and Explosives of Concern (MEC) remedial action (RA) in a portion of Bureau of Land Management Area B (BLM Area B). Figure 1 provides the general site location of BLM Area B. This SSWP includes the following appendices:

Appendix A: BLM Area B Community Outreach Plan

Appendix B: BLM Area B Site Security Plan

Appendix C: Accident Prevention Plan

Appendix D: Response to December 2015 BLM Letter Regarding Remedial Work at Area B

In compliance with the *Final Record of Decision, Track 2 Bureau of Land Management Area B and Munitions Response Site 16, Former Fort Ord, California* (ROD; United States Department of the Army [Army], 2017), surface MEC removal, subsurface MEC removal in selected areas, and digital geophysical mapping (DGM) are planned for portions of BLM Area B and will be conducted in accordance with the *Draft Work Plan, Remedial Design (RD)/Remedial Action (RA) Track 2 Bureau of Land Management Area B and Munitions Response Site 16, Former Fort Ord, California* (RD/RA WP; KEMRON Environmental Services, Inc. [KEMRON], 2017). Subsurface MEC removal will be conducted in portions of BLM Area B to address the risk associated with specific reuse, such as proposed or existing roads, fuel breaks, proposed or existing trails in the BLM trail network, and future habitat restoration sites.

KEMRON has prepared this SSWP for the United States Army Corps of Engineers (USACE) under the Worldwide Environmental Remediation Services (WERS) Contract No. W912DY-10- D-0027. The work elements discussed herein will be conducted in accordance with established WERS technical and administrative procedures in addition to protocols established in the *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Munitions Response, Appendix A, Munitions and Explosives of Concern Remedial Action* (MEC QAPP; KEMRON, 2016b). These standard procedures will be referenced where appropriate but will not be reiterated herein.

This MEC RA is being conducted in accordance with the ROD and RD/RA WP. BLM Area B was subdivided into eight sub-areas to evaluate the presence of MEC during the *Final, Revision 2, Track 2 Remedial Investigation/Feasibility Study, BLM Area B and MRS-16, Former Fort Ord, California* (RI/FS; Gilbane, 2015) (Figure 2). This SSWP supports the selected remedy for BLM Area B sub-areas B-2A and B-3 (792 acres) which is technology-aided surface

removal, with subsurface removal in selected areas, and land use controls (LUCs). The remedy was selected because it will achieve substantial risk reduction through MEC remediation and risk management through implementation of LUCs. The selected remedy best balances the risk reduction and associated environmental impacts in supporting the anticipated future use of the site as a habitat reserve and the Fort Ord National Monument.

1.1 Background

A comprehensive evaluation of BLM Area B and MRS-16 with regard to potential MEC risks consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 process was presented in the RI/FS.

To evaluate the potential presence of MEC, BLM Area B was subdivided into eight nature and extent sub-areas. The subdivision into these sub-areas was based on training uses and the level of previous munitions responses (MRs) conducted in their respective areas. These sub-areas are shown on Figure 2.

As a result of the comprehensive evaluation of BLM Area B, the RI/FS identified LUCs as the preferred remedial alternative for MRS-16 and BLM Area B sub-areas B-1, B-2, B-3A, B-4, B-5, B-6. Technology-aided surface removal, with subsurface removal in selected areas, and LUCs, was identified as the preferred remedial alternative for BLM Area B sub-areas B-2A and B-3. The *Superfund Proposed Plan, Remedial Action is Proposed for BLM Area B and Munitions Response Site 16 Track 2 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord, California* (Proposed Plan; Army, 2015) presented these preferred alternatives for public comment. These preferred alternatives were subsequently selected as the final remedies in the ROD.

1.2 Purpose

This SSWP is intended to address the fieldwork procedures within the sub-areas where MEC RA will be conducted. Fieldwork will be conducted in seven Remedial Work Areas (RWAs). Areas where MEC RA will be conducted (sub-areas B-2A and B-3: approximately 792 acres) in relation to the RWAs are shown on Figure 2. Public access will be temporarily restricted in and adjacent to RWAs when MEC operations are underway. To inform the public of MEC remediation related activities and to maintain public safety, this SSWP also contains a Community Outreach Plan (Appendix A) and a Site Security Plan (Appendix B).

The overall scope of this project entails the following elements. Vegetation clearance will be accomplished by prescribed burning, and/or manual and mechanical cutting, depending on vegetation type and removal requirement. Prescribed burning is planned in three of the RWAs as identified in Figure 5. Procedures for prescribed burning will be described in a prescribed burn plan that will be developed under separate cover. This SSWP outlines procedures for prescribed burn site preparation for planned burn areas, for vegetation cutting, and technology-

aided surface removal in designated areas (sub-areas B-2A and B-3). The SSWP provides procedures for DGM that will provide a record of anomalies to assist BLM in planning future activities. Subsurface removal will be performed in selected areas. Planned subsurface removal areas are identified in Figures 8 and 9. Additional subsurface removal areas may be identified in the Technical Memorandum (TM) (Section 2.5.2.2). Quality control (QC) will be implemented throughout the remedial process. Procedures are detailed in Section 2.5.

1.3 Site Location

The portion of BLM Area B (sub-areas B-2A and B-3) which this SSWP is intended to address is approximately 792 acres and is located north of the Impact Area Munitions Response Area (MRA). Figure 1 provides a regional location map of BLM Area B.

1.4 Military Training History

The types of training identified within BLM Area B sub-areas B-2A and B-3 include general maneuvers training, bivouac training, practice land mine training, hand grenade training, rifle grenade training, rocket training (shoulder-launched projectile training), and mortar training.

Sub-area B-2A, which is approximately 74 acres, includes MRS-19, MRS-48, and a portion of MRS-10B. Based on the 1997 Archive Search Report (ASR), sub-area B-2A includes a rifle grenade range (MRS-19), and dummy grenade range (MRS-48).

Sub-area B-3, which is approximately 718 acres, includes MRS-09, MRSs-27G and 27H, MRS-53BLM, MRS-41, MRS-54, the southern portion of MRS-56, and the northern portion of MRS-58. Based on the 1997 ASR, sub-area B-3 includes mine and booby-trap training (MRS-09), a powder magazine (MRS-41), shoulder-launched projectiles and artillery training (MRS-53 and MRS-54), general training and bivouac areas (MRS-27G and MRS-27H), and firing points and target area for rockets and shoulder-launched projectiles (MRS-58). Additional information is provided in the RI/FS.

1.5 Population, Proximity, and Access

The majority of the property within BLM Area B was transferred to BLM in 1996 as a habitat reserve. The remainder of BLM Area B is planned for future transfer to BLM. Established trails and roads in BLM Area B are currently accessible to the public for recreational use. These uses have been supported safely with past and current measures including MR and public explosives safety information and education. In 2012, current and future BLM lands at the former Fort Ord, including BLM Area B and MRS-16, were designated as the Fort Ord National Monument.

1.6 Reuse

BLM Area B and MRS-16 are designated as habitat reserve under the *Installation-Wide Multispecies Habitat Management Plan (HMP) for Former Fort Ord* (HMP; USACE, 1997)

and is currently either transferred or designated for transfer to BLM. The *Fort Ord Base Reuse Plan* developed by the Fort Ord Reuse Authority (FORA) (FORA, 1997) identified land use categories for various areas of the former Fort Ord that included development of public, commercial, and residential areas as well as areas for open space, recreation, and habitat management. Designated development and habitat reserve areas are also identified in the HMP. The *East Garrison and Parker Flats Land Use Modification Assessment* (Zander, 2002), and the Revised Attachment A – HMP map (April, 2005) present the revised boundaries of the habitat reserve areas. The HMP, as modified or updated, describes special LUCs and habitat monitoring requirements for target species within the habitat reserve and development areas that apply to Army's environmental cleanup actions as well as land management under future uses. Post-disposal (after the Army transfers the property) management guidelines outlined in the HMP for the Natural Resource Management Area (NRMA), which includes BLM Area B and MRS-16, includes habitat restoration, enhancement and monitoring, access control, controlled burning and an allowance for development-oriented use in as much as two percent of the area. Based on information provided by BLM, the reuse of the area as a habitat reserve is anticipated to include a variety of activities including:

- Recreational access on established routes;
- Habitat enhancement, including prescribed burning;
- Fuel break construction and management;
- Use of administrative areas;
- Habitat monitoring and educational programs;
- Species-specific monitors and habitat enhancement; and
- Road management and maintenance.

1.7 Regulatory Status

A comprehensive evaluation of BLM Area B and MRS-16 with regard to potential MEC risks was conducted in the RI/FS. The Proposed Plan for BLM Area B and MRS-16 was made available for a 30-day public comment period from April 8, 2015 to May 8, 2015. Public comments received on the Proposed Plan were addressed in the ROD. MEC remedial activities will follow the requirements detailed in the ROD and RD/RA WP.

1.8 Previous Munitions Responses

The types of munitions that may be expected based on the types of training discussed in Section 1.4 include practice land mines and booby traps, practice and potentially high explosive (HE) hand grenades and rifle grenades, shoulder-launched projectiles, and rockets. Mortar projectiles and other artillery munitions could be present related to the combat training ranges. Previous munitions investigations included sampling and site walks. Table 1 lists the MEC items recovered during these previous sampling and removal activities in BLM Area B sub-areas B-2A and B-3. Further detail regarding previous MEC sampling and removal activities in BLM Area B and MRS-16 are included in the RI/FS and is shown on Figure 4.

1.9 Changes to the Work Plan

This SSWP was prepared after careful evaluation and is based on the best available information. During execution of the work, unforeseen circumstances or events may arise that require modification to the procedures discussed herein. Changes to the SSWP will be identified through the use of a Field Work Variance (FWV).

An initial assessment will be made by the KEMRON Project Manager (PM) who will discuss a potential modification with the USACE PM. KEMRON will develop and submit the required changes to USACE PM for review and approval/acceptance. The KEMRON PM (or his designee) will provide the FWV to the USACE PM and the Fort Ord Base Realignment and Closure (BRAC) office whether the change is material or procedural and how it will be implemented. If the change is material, the Army will notify regulatory agencies.

If the circumstances requiring the change are material and involve a safety or quality concern, the KEMRON PM will immediately suspend work affected by the unforeseen condition or activity until the cause is investigated and approved procedures are in place. The KEMRON PM will also immediately notify the USACE PM and, if appropriate, the Fort Ord BRAC office. Under no circumstances will any change to this SSWP be executed unless specifically approved by the USACE and the KEMRON PM. Approved modifications will be incorporated into this SSWP and provided to installation personnel, regulators, and interested stakeholders prior to implementation.

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SECTION 2 TECHNICAL MANAGEMENT PLAN

2.1 General

This Technical Management Plan identifies the approach, methods, and operational procedures to be employed during the MEC RA covered under this SSWP.

The overall scope of this project entails vegetation clearance and a technology-aided surface MEC removal across approximately 792 acres of BLM Area B; DGM in the surface MEC removal areas to provide a record of anomalies left in place; and subsurface MEC removal in selected portions of the site to address the risk associated with specific reuse. Prescribed burns are planned in three of the RWAs requiring prescribed burn site preparation actions. To inform the public of MEC remediation related activities and to maintain public safety, community outreach and site security measures will also be implemented.

- Figure 3 shows the proposed surface MEC removal grids within BLM Area B and existing BLM recreational trails.
- Figure 4 shows MEC items recovered as part of previous actions.
- Figure 5 shows RWAs within BLM Area B where vegetation clearance will be performed by, and in support of, prescribed burns.
- Figure 6 shows RWAs within BLM Area B where vegetation clearance will be performed using only manual or mechanical equipment.
- Figure 7 shows RWAs within BLM Area B where technology-aided surface MEC removal and DGM survey will be performed.
- Figure 8 shows where subsurface MEC removal will be performed to support U.S. Army prescribed burn operations.
- Figure 9 shows where subsurface MEC removal will be performed to support current and future planned reuse of the property by BLM.
- Figures 10a through 10d show where subsurface MEC removal is planned in BLM Area B in more detail.
- Appendix A includes the BLM Area B Community Outreach Plan.
- Appendix B includes the BLM Area B Site Security Plan.

Fieldwork will be managed in seven RWAs. General work flow for each RWA begins with initiating community outreach; conducting vegetation clearance; implementing technology-aided surface MEC removal; and performing planned subsurface removal on trails within the RWA (shown in Figure 9). A technical information paper (TIP) will be prepared to evaluate the work completed and identify specific trails that may be considered for reopening for public access while DGM is underway. The trails will remain closed until approval is obtained from the regulatory agencies. Fieldwork will continue with the performance of DGM. A TM will be

prepared to provide recommendation for additional work in the RWA based on information obtained during the technology-aided surface removal and DGM survey. If the TM identifies additional work it will be conducted and then site security will be taken down. A Remedial Action Report (RAR) will be prepared to document the completion of all work conducted in the RWA. Work flow for RWAs where vegetation clearance will be performed by prescribed burns is shown in Flowchart 1. Work flow for RWAs where vegetation clearance will be performed by manual and mechanical cutting is shown in Flowchart 2. Flowchart 3 shows the supporting documents in relation to the planned fieldwork elements.

Procedures for prescribed burning, habitat monitoring, and implementation of LUCs, are not addressed in this SSWP.

All site work-related activities will be performed within guidelines established in the *Final Basewide Accident Prevention Plan (APP), Munitions and Explosives of Concern Removal and Soil Remediation, Revision 1, Former Fort Ord, California* (KEMRON, 2016a), which is included in Appendix C of this SSWP. The APP includes the Site Safety and Health Plan.

2.2 Guidance, Regulations, and Policy

The work will be performed under the USACE requirements outlined in the Task Order Performance Work Statement (PWS). Additional applicable guidance, regulations, and policy are provided in the MEC QAPP.

2.3 Discovery of Chemical Warfare Material (CWM)

Chemical Warfare Material (CWM) is not expected to be encountered within BLM Area B based on historical research and previous investigations. Procedures to be followed if CWM is encountered during work performed within BLM Area B are provided in the MEC QAPP. Further details regarding procedures to be followed in the event of the discovery of a suspect CWM item can be found in *Recovered Chemical Warfare Materiel (RCWM) Response Process*, *Engineering Pamphlet (EP) 75-1-3* (USACE, 2004). In the unlikely event of encountering Chemical Agent Identification Set kits, they will be handled in accordance with the procedures included in *Policy Guidance – Chemical Agent Identification Sets Containing Dilute Agent (Except Dilute Nerve) and Industrial Chemicals* (Army, 2008).

2.4 Procedures When MPPEH Cannot Be Treated On Site or Unidentified MPPEH Are Discovered

In the event that material potentially presenting an explosive hazard (MPPEH) is encountered that cannot be disposed or readily identified, the USACE Ordnance and Explosives Safety Specialist (OESS) will be notified. If the USACE OESS is unable to identify the MPPEH item, Vandenberg Air Force Base (AFB) Explosive Ordnance Disposal (EOD) personnel will be contacted. Contact information for the Vandenberg AFB EOD is included in the MEC

QAPP. The Senior Unexploded Ordnance Supervisor (SUXOS) will ensure that the area is properly secured until properly relieved by active duty EOD personnel.

2.5 Technical Scope

The activities to be performed within BLM Area B follow the requirements of ROD and are summarized above in Section 2.1 of this SSWP.

The project work elements include:

Work Element 1- Develop a SSWP (this document).

Work Element 2- Mobilize and set up site. Multiple mobilizations may occur. Includes initiating community outreach actions and establishing site security.

Work Element 3- Cut vegetation in prescribed burn secondary and tertiary containment lines and cut only BLM Area B RWAs.

Work Element 4- Establish containment lines (cut vegetation) and remove/protect combustible materials in BLM Area B prescribed burn RWAs.

Work Element 5- Conduct technology-aided surface MEC removal in vegetation cleared areas in sub-areas B-2A and B-3.

Work Element 6- Conduct subsurface MEC removal where subsurface MEC removal is currently planned on existing or planned trails, and fuel breaks.

Work Element 7- Provide burn support as needed for the Presidio of Monterey Fire Department (POMFD) during prescribed burn operations.

Work Element 8- Cut remaining stems and branches and any unburned vegetation following prescribed burns. Unexploded ordnance (UXO) avoidance and construction support will be conducted in conjunction with this task.

Work Element 9- Conduct a grid and border survey based on the Fort Ord Master Grid System and establish MEC removal area boundaries.

Work Element 10- Conduct a technology-aided surface MEC removal over the area newly cleared of vegetation.

Work Element 11- Develop a TIP evaluating the MEC removal to identify specific trails that can be considered for reopening for public access during conduct of DGM survey.

Work Element 12- Perform DGM survey over the area of vegetation removal and surface MEC removal where practicable in accordance with established Measurement Quality Objectives (MQOs).

Work Element 13- Conduct subsurface MEC removal on existing or planned trails, and not performed as part of Work Element 6.

Work Element 14- Develop a TM following the DGM that details recommendations for additional subsurface removal, if any, based on DGM data results and surface MEC removal activities.

Work Element 15- Conduct subsurface MEC removal activities as recommended by the TM and approved by the BRAC Cleanup Team (BCT).

Work Element 16- Perform erosion control as needed.

Work Element 17- Demobilize after final Quality Assurance (QA)/QC inspections are completed.

Work Element 18- Develop a RWA specific RAR.

Work Element 19- Develop a Remedial Action Completion Report (RACR) for the BLM Area B MEC remediation area.

The following sections provide details on the site-specific technical approach and procedures to be used to achieve the work elements listed above. Discussions of protocols addressed under the MEC QAPP will not be repeated in this SSWP. Appropriate sections will be referenced to the MEC QAPP, as needed, to support technical management planning.

2.5.1 Field Activities

Flowchart 1 shows planned fieldwork in RWAs within BLM Area B where vegetation clearance will be performed by prescribed burns. Flowchart 2 shows planned fieldwork in RWAs within BLM Area B where vegetation clearance will be performed using only manual or mechanical equipment. Further details regarding BLM Area B fieldwork are included below.

2.5.1.1 Mobilization and Site Setup

Multiple mobilizations may occur for this project which includes mobilizations of the vegetation cutting subcontractor and additional personnel as needed to support MEC remediation activities. KEMRON will use Building 4522, Joe Lloyd Way as a field office. This field office will be the central command location for direction and coordination of MEC activities. Personnel will report to the field office at the beginning of each workday for the daily health and safety briefing. Health and safety records will also be maintained in the field office. Temporary break and sanitation facilities will be established at the work site. Community outreach actions will be

initiated (described in Appendix A). Site security measures will be in place prior to commencement of the fieldwork (Appendix B).

2.5.1.2 Cut Vegetation in Prescribed Burn Secondary and Tertiary Containment Lines and Cut Only RWAs

Vegetation cutting teams, with as-needed escort support from UXO-qualified personnel (minimum UXO Technician II), will cut vegetation in BLM Area B prescribed burn secondary and tertiary containment lines (Figure 5) and cut only RWAs (Figure 6). Mechanical equipment will be used to cut the vegetation to the extent possible. Vegetation will be cut to a height of six inches or less above the ground surface unless vegetation is specifically marked for protection and avoidance. Mechanically cut vegetation material is shredded in the process and left on the ground surface. Manual tools, such as trimmers, may be used in areas where the mechanical cutter cannot gain access. In oak woodland areas, trees greater than four inches in diameter at breast height will be limbed up and not removed in their entirety. Oak trees less than four inches diameter at breast height may be removed in their entirety. Vegetation in and around wetland areas will be cut when the wetlands are dry. All vegetation manually cut will be chipped and removed from the site. Chipped material will be used for erosion control and restoration activities where feasible. Further detail regarding vegetation removal is included in Field Standard Operating Procedure (SOP) 4 of the MEC QAPP.

Each UXO escort will use a magnetometer as needed in conjunction with a visual survey of the ground surface to identify MEC/MPPEH. If MEC/MPPEH or an unknown item is encountered during mastication, vegetation cutting will stop, and the UXO escort will investigate the item. Procedures for management of MEC/MPPEH are provided in UXO SOP 5 of the MEC QAPP.

2.5.1.3 Establish Containment Lines and Remove/Protect Combustible Materials in Prescribed Burn RWAs

Establish containment lines in and around BLM Area B as shown on Figure 5 and remove/protect combustible materials within containment lines.

The vegetation cutting teams, with escort support from UXO-qualified personnel (minimum UXO Technician II), will create containment lines around BLM Area B RWAs where prescribed burning is planned (Figure 5). This will be a one-time cutting; the vegetation will be allowed to regrow following the completion of the RA. Mechanical equipment will be used to cut the vegetation to the extent possible. Manual tools, such as trimmers, may be used in areas where the mechanical cutter cannot gain access. Grass and oak woodland areas will receive only the minimal amount of cutting required to serve as effective containment for prescribed burning. All vegetation manually cut will be chipped or removed from the site. Mechanically cut vegetation will remain at the site. Any accessible, combustible materials, such as wooden

structures, tires, and treated lumber, will be removed from the site or protected as part of the preparations prior to prescribed burning if safe to do so.

Each UXO escort will use a magnetometer as needed in conjunction with a visual survey of the ground surface to identify MEC/MPPEH. If MEC/MPPEH or an unknown item is encountered during mastication, vegetation cutting will stop, and the UXO escort will investigate the item. Procedures for management of MEC/MPPEH are provided in UXO SOP 5 of the MEC QAPP.

Prior to prescribed burn operations, a technology-aided surface MEC removal will be conducted in the primary containment lines to support prescribed burns planned within BLM Area B. This will include establishing grids, tracking the coverage with lanes, and completing the removal in partial grids as described in Field SOP 3 and UXO SOP 2 of the MEC QAPP and Section 2.5.1.6 and 2.5.1.7 below. The QC criteria described in Section 10 of this SSWP and UXO SOP 10 of the MEC QAPP will apply to this work.

The POMFD may choose to complete the containment line establishment by blacklining (burning the existing vegetation within the containment lines). If blacklining is performed within the primary containment line, KEMRON will delineate the extent of blacklining activities using a global positioning system (GPS) for future biological monitoring purposes.

2.5.1.4 Prescribed Burn Support

Prescribed burning will be performed by the POMFD. KEMRON will provide UXO escorts and other support required by the POMFD and USACE before, during, and immediately following prescribed burns. Prescribed burn support includes provision of aerial and ground ignition and suppression equipment and personnel, water supply transport and management, site security and UXO escort personnel. Following completion of prescribed burning, KEMRON will document areas that did/did not burn, unless otherwise directed.

2.5.1.5 Cut Vegetation Following Prescribed Burns

Following prescribed burns, it will be necessary to cut remnant stems and branches that either did not burn at all or did not burn completely to allow for the effective and efficient use of geophysical survey equipment during surface MEC removal and DGM survey. The UXO team will first conduct a visual survey to determine that it is safe to enter areas that require additional vegetation cutting. UXO-qualified personnel will then provide escort for the vegetation cutting team. The remnant vegetation will be cut either mechanically or manually, depending on the type and condition of the vegetation. Cutting of unburned vegetation will be coordinated with the Fort Ord BRAC Biologist.

2.5.1.6 Grid and Border Survey

Following vegetation clearance in a RWA, remedial work grids will be established (shown in Figure 7). A GPS Technician accompanied by a UXO Technician II (minimum) escort performing anomaly avoidance will establish grids that utilize the Fort Ord Master Grid System with grid sizes of 100 feet by 100 feet. The grid nodes will be marked with wooden stakes and each will be labeled with a unique identification.

2.5.1.7 Technology-Aided Surface MEC Removal

Following vegetation clearance and completion of the grid and border survey, a technology-aided surface MEC removal will be conducted in remedial work grids (shown in Figure 7). The intent of the surface MEC removal is twofold: 1) to remove surface MEC and 2) to remove metallic debris including munitions debris (MD), range-related debris (RRD), and other debris that could impact the DGM survey results.

Any item that can be MEC or Material Documented as an Explosive Hazard (MDEH), and MD items that could be mistaken for MEC, will be removed from the ground surface. Metallic object the size of an LE, MKI, 37 millimeter (mm) projectile (without fuze) [1.47”x1.47”x3.5”] or larger will be removed. Single expended small arms shell casings (small arms) are not required to be removed, since they do not pose an explosive hazard and will not interfere with DGM. Piles of expended shell casings will be removed. The ground surface will be considered the extent of surface removal. There will be no scuffing of soil to find metallic items detected with magnetometers. If an item is partially visible on the surface, it will be removed as part of surface removal. Blind QC seeding will be conducted in accordance with GEO SOP 2 of the MEC QAPP, and QC and QA inspection of the technology-aided surface MEC removal will be conducted prior to the DGM survey.

During surface MEC removal, UXO teams will use magnetometers at all times to support visual identification of MPPEH and MD. UXO personnel will walk in parallel lines across each removal grid to provide complete visual coverage. Visual and magnetometer inspection will be conducted in five foot wide search lanes in all grids and will be delineated using rope. The UXO Team will investigate all magnetometer ring-offs on the exposed surface. If the surface is covered by vegetation, the UXO Technician will remove the vegetation at the magnetometer ring-off to expose the soil surface.

MPPEH will be managed in accordance with the UXO SOP 5 of the MEC QAPP. All MPPEH items recovered in the field will first be inspected by the UXO Team to evaluate if the item is a potential MEC or MDEH item. The location of each MPPEH item will be recorded with a GPS or from the southwest grid corner to acquire the geo-referenced location at which it was found. MD will be tracked by general item type and estimated weight on a grid-by-grid basis. The estimated weight of RRD per grid will be recorded. Recovered MD will be stored in lockable containers at a designated staging area for inspection and future disposal. QC tasks

will be performed in accordance with UXO SOP 10 of the MEC QAPP and Section 10 of this SSWP.

Surface MEC removal personnel will be trained to recognize and document evidence of potential soil contamination. Any indication of potential soil contamination will be documented and provided to personnel conducting range assessment as part of the Basewide Range Assessment program.

2.5.1.8 Digital Geophysical Mapping (DGM)

Following technology-aided surface MEC removal, DGM will be conducted in accessible areas. Site conditions (e.g. difficult terrain, trees) may prevent DGM from being conducted in certain areas; these areas will be documented in the TMs.

DGM will be conducted using the current standard equipment, EM61-MK2As in towed array. In some cases EM61-MK2As in person-portable mode may be used. Based on expected future planned work, the standards by which geophysical mapping will be carried out can be classified as either Category A or Category B. In both cases, the objective is to map 100% of the area in question. Category A data are deemed complete and suitable for the selection of individual anomalies for subsurface MEC removal. Category B data are collected with modified MQOs with regard to line spacing. The MQOs are provided in Section 6 of this SSWP. In practice, though, the only significant difference between Category A and B data is the possible existence of data gaps in Category B datasets. With fill-in of data gaps, Category B data is of high enough quality that it could be used for anomaly selection and investigation purposes.

DGM survey procedures, including anomaly selection criteria and QC requirements, are provided in GEO SOPS 4, 7, and 8 of the MEC QAPP, and detailed site-specific procedures are provided in Section 6 of this SSWP. As necessary, reacquired anomalies will be investigated using excavation procedures outlined in UXO SOP 4 in the MEC QAPP.

2.5.1.9 Subsurface MEC Removal

Areas where subsurface MEC removal is currently planned are shown on Figures 8 and 9. Additional areas requiring subsurface MEC removal, if any, will be identified in the TM to be developed following completion of technology-aided surface MEC removal and DGM survey (discussed in Section 2.5.2.2). Subsurface MEC removal may be analog- based or DGM-based, depending on site conditions. The following text outlines procedures for subsurface removal:

If DGM based subsurface MEC removal is performed, DGM data quality will be reviewed and brought to the Category A standards appropriate for anomaly selection and subsequent intrusive investigation. Anomalies identified during DGM activities will be intrusively investigated to identify the source. If the subsurface contact proves to be MD, RRD, or other debris,

visible metal will be removed, and the excavation will be rechecked by the UXO team to verify that the area has been cleared. The vicinity around the excavation will also be checked to make sure that other anomalies were not masked by the recovered item. Both the excavation location and the immediate surrounding area will be checked by monitoring the response of the EM61-MK2A as it is moved over the area being tested. Procedures for intrusive investigations of DGM targets are described in UXO SOP 4 of the MEC QAPP.

During analog-based subsurface MEC removal, UXO teams will use magnetometers at all times to support intrusive investigation of subsurface anomalies. UXO personnel will walk in parallel lines across each removal grid to provide complete coverage. Analog-based subsurface MEC removal will be conducted in five foot wide search lanes, and lanes will be delineated using rope. The UXO Team will investigate all magnetometer ring-offs in the subsurface to a depth of four feet, or deeper if directed by USACE. Procedures for intrusive investigation using analog methods are described in UXO SOP 3 of the MEC QAPP.

During subsurface MEC removal operations, detected metal the size of an LE, MKI, 37mm projectile (without fuze) [1.47”x1.47”x3.5”] or larger will be removed.

MPPEH will be managed in accordance with the UXO SOP 5 of the MEC QAPP. All MPPEH items recovered in the field will first be inspected by the UXO Team to evaluate if the item is a potential MEC or MDEH item. Each MEC and MDEH item identified by the UXO teams will be tracked by item type, description, weight, and recovery depth (to the top of the item). The location of MEC and MDEH will be recorded with a GPS or from the southwest grid corner to acquire the geo-referenced location at which it was found. The general type of MD items encountered per investigation location will be tracked by UXO teams. QC tasks will be performed in accordance with UXO SOP 10 of the MEC QAPP and Section 10 of this SSWP.

Advanced geophysical classification is an additional tool that can be utilized to conduct subsurface MEC removal. If advanced geophysical classification techniques are used, the protocols established in *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Munitions Response, Appendix B, Advanced Geophysical Classification for Munitions Response Quality Assurance Project Plan* (KEMRON, 2016c) will be followed.

2.5.1.10 Erosion Control

Identification of existing and potential erosion features will be conducted prior to the start of work, to the extent possible. Measures will be implemented to limit erosion due to MEC cleanup activities. During and at the completion of the project, KEMRON will provide appropriate site restoration and erosion control, if required. The Environmental Protection Plan for this work is presented as Section 11 of this SSWP. UXO escort will be provided as required for erosion control work conducted prior to completion of the project.

2.5.1.11 Demobilization

Demobilization will occur when the project is completed with appropriate QA/QC checks performed. During demobilization, personnel will be retained only as long as necessary. If personnel are not required at other former Fort Ord MEC projects, they will be demobilized from the site. Physical site security measures will be removed or updated. The following will occur prior to demobilization:

- Verification that all areas to be investigated/remediated are completed to the requirements of the PWS.
- Identification of all areas that could not be investigated/remediated.
- Verification that site restoration has been performed to requirements.
- Documentation that ultimate disposition of property used during the project has been performed.

2.5.2 Documentation

Flowchart 3 shows supporting documents in relation to the planned fieldwork elements described above. Further details regarding documents are included below.

2.5.2.1 Technical Information Paper (TIP)

A TIP will be developed following completion of technology-aided surface removal, and planned subsurface removal on trails within the RWA (shown in Figure 9). The TIP will evaluate the results from the surface and subsurface MEC removal and identify specific trails that may be considered for reopening for public access while DGM is underway. The TIP will be prepared and submitted to the regulatory agencies while the fieldwork proceeds to the DGM survey. The trails will remain closed until approval is obtained from the regulatory agencies.

2.5.2.2 Technical Memorandum

A TM will be developed for an RWA following completion of the technology-aided surface MEC removal and DGM survey to provide an evaluation of the work completed to date and, if necessary, recommend additional subsurface MEC removal based on the results of the evaluation. The TM will identify any additional subsurface removal areas determined as necessary for reuse of the area as a habitat reserve, and identified by the Army in coordination with BLM.

Factors that will be considered when determining whether additional MEC removal is necessary include (a) the types and amounts of MEC recovered during the technology-aided surface MEC removal; and (b) reasonably anticipated or known reuse activities that will occur. If no additional work is warranted the TM will document this recommendation and supporting rationale.

TMs will be provided for regulatory agency (EPA and DTSC) review.

2.5.2.3 Remedial Action Report

A RAR specific to the RWA (or a group of RWAs) will be prepared to summarize field operations and results generated from MEC remediation activities. Data acquired during these activities will be evaluated and results will be used to support project conclusions.

2.5.2.4 Remedial Action Completion Report

A RACR specific to the entire BLM Area B MEC remediation area will be prepared to summarize field operations and results generated from MEC remediation activities at the completion of the project. Data acquired during these activities will be presented and used to validate project conclusions.

2.6 Munitions with Greatest Fragmentation Distance

To determine safety distances for workers and the public during MEC operations, the Munition with the Greatest Fragmentation Distance (MGFD) was established for BLM Area B, based on historical range and MEC sampling and removal data. The MGFD for BLM Area B has been submitted and approved by the Army and Department of Defense (DoD) explosives safety agencies. During the course of RA, if MEC with a greater fragmentation distance is encountered, the Minimum Separation Distances (MSDs) will be adjusted in accordance with fragmentation data review forms or Department of Defense Explosives Safety Board (DDESB) *Technical Paper (TP) 16 Methodologies for Calculating Primary Fragment Characteristics* (DDESB, 2017). A copy of TP 16 will be maintained on file at the site. Safety distances will be adjusted accordingly and an amendment to the applicable Explosives Safety Submission (ESS) will be submitted to USACE.

MSDs were established based on the MGFD of BLM Area B and are shown in Table 2 below. Exclusion zones are not expected to impact neighboring residential properties but will preclude public access in and adjacent to RWAs when MEC operations are underway. KEMRON will conduct the work utilizing engineering controls during intrusive investigation and detonation operations as needed. Site security measures will be implemented in accordance with Appendix B, BLM Area B Site Security Plan.

Table 2. Minimum Separation Distances BLM Area B

MEC	For Unintentional Detonations [1]		For Intentional Detonations	
	Team Separation Distance (K40) (ft)	Hazardous Fragmentation Distance (HFD) (ft)	MFD-H without Engineering Control (ft)	Using Sandbag Mitigation (ft)
4.5 inch Barrage Rocket, HE, MK III	75	316	1759	220

2.7 Project Personnel, Organization, Communication, and Reporting

Personnel qualifications will be documented with all UXO personnel meeting the qualification requirements of DDESB TP 18 (DDESB, 2016). The project organization chart is provided as Figure 1-1 of the MEC QAPP. The project team will include the following managerial and technical positions:

- PM: Stephen Crane, KEMRON
- Deputy PM: Erin Caruso, Gilbane
- MEC Remediation Manager: Kevin Siemann, Gilbane
- SUXOS: Brad Olson, KEMRON
- Unexploded Ordnance Quality Control Specialist (UXOQCS): Bruce McClain, KEMRON
- UXO Safety Officer (UXOSO): Val Valdez, KEMRON
- Contract Quality Control System Manager (CQCSM): Chuck Clyde, Gilbane
- Project Biologist: Jami Davis, Denise Duffy and Associates
- QC Geophysicist: Alex Kostera, NAEVA Geophysics (NAEVA)
- Project Geophysicist: Andy Gascho, Gilbane

- UXO Technicians: KEMRON and Gilbane
- Digital Geophysical Technicians: NAEVA
- Geographic Information System (GIS) Database Manager: Larry Carr, Gilbane

2.8 MEC and MPPEH Management

All MPPEH items recovered in the field will first be inspected by the UXO Team to evaluate if the item is a potential MEC or MDEH item. All MEC and MDEH items will be blow-in-place unless authorization to move MEC or MDEH items is received from the USACE OESS. Items considered to be safe to move will be incorporated into collection points within the Impact Area MRA as the item is discovered. Consolidated shots will be conducted within the Impact Area MRA. There are no planned or established demolition areas within BLM Area B, as the majority of potential MEC items are expected to be transportable. Recovered MEC and MDEH will be treated by detonation. Detonation procedures are provided in UXO SOP 6 of the MEC QAPP. As necessary, UXO teams will use engineering controls to reduce the fragmentation distance during intentional detonations. The maximum fragment range–horizontal will be used for all unmitigated intentional detonations.

Guidance detailed in DoD 6055.09-M (DoD, 2012) will be applied for sorting and disposition of MPPEH. Operational data (including recovery information, such as date excavated, grid location, item type/classification, observed depth, estimated weight, and detailed description) will be recorded for each excavated MEC item. Requirements for MD and scrap management are provided in UXO SOP 5 of the MEC QAPP.

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SECTION 3 EXPLOSIVES MANAGEMENT PLAN

UXO SOP 7 of the MEC QAPP details the Explosives Management Plan for surface and subsurface removal activities.

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SECTION 4 EXPLOSIVES SITING PLAN

Explosives siting information for BLM Area B is included in an ESS that was submitted to and approved by DDESB.

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SECTION 5 GEOPHYSICAL SYSTEM VERIFICATION (GSV)

KEMRON uses the GSV process to verify and demonstrate the integrity of the geophysical mapping system. The collected data will also help to quantify site-specific geophysical characteristics that determine the detectability of items of interest. A detailed description of the GSV approach is given in the Environmental Security Technology Certification Program (ESTCP) report *Geophysical System Verification (GSV): A Physics-Based Alternative to Geophysical Prove-Outs (GPO) for Munitions Response* published in July 2009. A GSV TM will be prepared after completion of initial DGM system verification detailing the GSV process and results.

Digital geophysical instrument performance will be verified prior to field use and throughout the project duration. The equipment will be operated over an instrument verification strip (IVS) seeded with industry standard objects (ISOs) and inert ordnance items of the types that are expected to be found in the work area, buried at depths that are dependent upon the items selected. For efficiency of DGM operations, multiple IVS locations may be established throughout the BLM Area B RWA at suitable locations agreed upon by KEMRON, Gilbane, NAEVA, and USACE. Existing IVS locations may be utilized after confirmation of item burial locations and depths or reburial of items. A background geophysical mapping survey will be conducted at the selected location prior to IVS construction, and any existing metallic items that would interfere with use of the IVS will be removed. An IVS will not be utilized for DGM system verification until its design and construction have been approved by USACE.

DGM responses measured over the IVS ISOs will be compared to the known responses of these items, as determined by the Naval Research Laboratory (NRL), as well as to historical readings from previous EM61 surveys at former Fort Ord. Consistent results are indicative that the geophysical sensors and positioning instrumentation are working properly. MQOs for DGM surveys are described in Section 6 of this SSWP.

The primary DGM deployment platform consists of a vehicular-towed array of three EM61-MK2A sensors integrated with Real Time Kinematic (RTK)-GPS for data positioning. The 1-m x ½-m EM61-MK2A coils are mounted so that the three coils are 15.75 inches (40 centimeter [cm]) above the ground surface, with centers laterally offset from each other by a distance of two feet. This is achieved by offsetting the center coil in the direction of travel. Alternatively, a single-coil person-portable EM61-MK2A system will be used in areas where site conditions preclude the use of the larger towed-array system. The person-portable EM61-MK2A is mounted on standard manufacturer-provided wheels that position the coil at the same height above the ground surface as that of the towed-array system (15.75 inches (40 cm)).

The IVS will include sets of test items placed at offset locations along three lanes to allow each EM61-MK2A sensor in the towed-array to pass directly over the center of one item in each set. The lanes will be separated laterally by a distance of 2 feet. Each lane will contain two small

ISOs placed vertically at 6 inches below ground surface (bgs) and two functioned 40mm M918 practice projectiles placed horizontally and vertically at depths of 3 and 7 times their diameters, respectively. Items in each lane will be separated by a distance of 8 to 15 feet along the lane depending on site-specific spatial constraints. To minimize tow vehicle turns and reduce negative impact on the habitat, the IVS will be of sufficient length to include a background measurement section free of metallic interference. This will eliminate the need to survey multiple adjacent paths to obtain background measurements as suggested in the original NRL approach.

Table 3 summarizes the IVS item information. Items are buried in sets of three such that one of each listed item is buried along each of the three IVS lanes.

Table 3 IVS Seed Item Information

Item	Type	Orientation	Depth (inches)*
1	Small ISO	Vertical	6
2	Small ISO	Vertical	6
3	40mm	Horizontal	5
4	40mm	Vertical	11

* Depths are reported to the center of mass of the item

IVS surveys will be conducted utilizing the same system configuration and survey procedures used for production DGM surveys. To minimize ground disturbance, IVS surveys will be collected in one direction to demonstrate the repeatability of collected data. In addition to the initial GSV IVS survey, IVS surveys will be conducted in conjunction with the geophysical system functional checks described in Section 6 of this SSWP daily during DGM operations to verify on-going DGM system performance. Further detail regarding establishment of an IVS is included in GEO SOP 1 of the MEC QAPP.

The second component of the GSV is the placement of blind seed items throughout the areas to be mapped (including both Category A and Category B areas). To produce standardized results for quantitative comparison, blind seed items will consist of small ISOs buried vertically with their center of mass 6 inches bgs. For DGM surveys using RTK-GPS positioning, blind seed items will be placed such that each team encounters, on average, at least one seed item per day of data collection. The seed item density will be increased to an average of two seed items encountered per day in areas where DGM surveys will be conducted utilizing fiducial positioning methods. Blind seed items will be removed at the conclusion of work in each unit. MQOs for blind seed item detection and identification are described in GEO SOP 2 of the MEC QAPP.

SECTION 6 GEOPHYSICAL INVESTIGATION PLAN (GIP)

Section 6 details the GIP for DGM activities planned in accessible areas of BLM Area B where vegetation has been removed. This site-specific GIP is intended to be used in addition to GEO SOPs 3 and 4 of the MEC QAPP.

6.1 Geophysical Investigation Objectives

Following technology-aided surface MEC removal activities, DGM surveys will be conducted in areas where vegetation has been removed (Figures 5 and 6). The results of the DGM survey will be used to:

1. Perform DGM-based subsurface MEC removal in areas selected for DGM-based subsurface removal.
2. Evaluate subsurface conditions after completion of DGM to support recommendations in the TM.
3. Serve as a record of anomalies left in place.
4. Direct additional subsurface MEC removal, if required, as recommended in the TM.

Currently planned subsurface removal areas are shown in Figures 8 and 9. Unless analog subsurface removal has been performed or planned, DGM MQOs will be Category A in these areas. The two categories of DGM, referred to as Category A and Category B, are described in Section 6.7 of this SSWP.

6.2 MEC Detection

Site-specific MEC detection capability has been previously demonstrated through the Ordnance Detection and Discrimination Study (ODDS) (Parsons, Inc. [Parsons], 2002). In the ODDS investigation, five plots were cleared in the portion of MRS-BLM Unit 12 known as Badger Flats, two of which were subsequently seeded with inert munitions items with locations known to the contractor. GPO investigations using the ODDS plots have demonstrated that these items are generally detectable with the EM61-MK2A to performance depths 11 times the diameter of the target as described in the *Final MRS-16 Geophysical Prove-Out Report, Former Fort Ord, California* (Shaw Environmental, Inc. [Shaw], 2007). For example, a MKII grenade was detected at 6 inches and 12 inches bgs; a 35mm M73 was detected at 24 inches bgs; a 37mm was detected at 18 inches bgs; an 81mm mortar M43 was detected at 36 inches bgs; and a 3-inch Stokes mortar was detected at 40 inches bgs.

Table 1 lists the MEC items that have been previously recovered within and around BLM Area B (sub-areas B-2A and B-3). Locations of these MEC items are presented in Figure 4.

6.3 Personnel

Personnel duties for the implementation of DGM activities are provided in Table 1-1 of the MEC QAPP. The duty of the DGM team is to collect DGM data of sufficient quantity and quality to fulfill the project-specific MQOs. It is anticipated that field teams consisting of one NAEVA geophysicist and one equipment operator per team will execute the DGM survey. The DGM teams will report to the Project Geophysicist, who is responsible for the execution of the fieldwork by the DGM teams. DGM data will be processed and analyzed offsite by NAEVA geophysicists. All DGM survey activities will be managed by the Project Geophysicist.

6.4 Site Conditions

BLM Area B is generally composed of sandy soils in rolling terrain dominated by central maritime chaparral (CMC).

Habitat types occurring within BLM Area B are primarily CMC, with some areas of oak woodland and grassland. CMC is a dominant habitat type at former Fort Ord and is identified as a protected plant community in the HMP. Additionally, several vernal ponds and the associated wetlands are present that are also protected in the HMP.

The habitat types present within BLM Area B (sub-areas B-2A and B-3) are known or have the potential to contain special-status flora and faunal species identified in the HMP. Species that may be encountered within CMC are the HMP annual plants sand gilia (*Gilia tenuiflora arenaria*), Monterey spineflower (*Chorizanthe p. pungens*), coast wallflower (*Erysimum ammophilum*), and Contra Costa goldfields (*Lasthenia conjugens*); the perennial Yadon's piperia (*Piperia yadonii*); and the shrub species Hooker's manzanita (*Arctostaphylos h. hookeri*), sandmat manzanita (*A. pumila*), Monterey manzanita (*A. montereyensis*), Monterey Ceanothus (*Ceanothus rigidus*), and Eastwood's golden bush (*Ericameria fasciculata*). Black legless lizards (*Anniella pulchra nigra*) could be encountered in any areas with sandy soils. California tiger salamanders (CTS) (*Ambystoma californiense*) may be encountered, as Ponds 42 and 60 are known breeding habitat, and upland and dispersal habitat occur within BLM Area B.

Although these species and protected habitats are known or may occur within BLM Area B, their presence will not preclude surface or subsurface MEC removal activities.

DGM may not be possible in some portions of the site due to site conditions, such as extreme terrain, Toro manzanita limbed up and left in place, and the existence of dense oak tree stands.

6.5 Survey Control

Survey control procedures are discussed in DATA SOP 1 of the MEC QAPP.

6.6 Geophysical Sensors, Deployment Platform, and Positioning Techniques

The geophysical sensors, deployment platform, and positioning techniques to be utilized are described in GEO SOPs 3 and 4 of the MEC QAPP.

6.7 Geophysical Survey Modes

Implementation of the DGM system is described in GEO SOPs 3 and 4 of the MEC QAPP. Standard DGM surveys will be conducted using the 3-coil vehicular towed-array system described in GEO SOP 4 of the MEC QAPP.

All planned DGM surveys within these units will be Category B, except where DGM-based subsurface MEC removal is planned. In areas where DGM-based subsurface MEC removal is planned, DGM surveys will be Category A. All DGM surveys will be conducted in accordance with the MQOs designed for the project, which are discussed in GEO SOP 8 of the MEC QAPP. If a Category B DGM survey area is subsequently designated for subsurface removal, DGM data quality will be evaluated to determine if it is adequate for subsurface removal. If DGM data quality within the Category B DGM survey area is deemed inadequate for subsurface removal, additional data collection will be required to meet Category A MQOs.

DGM may not be possible in some portions of the site due to site conditions, such as extreme terrain, Toro manzanita limbed up and left in place, and the existence of dense oak tree stands. Any potential removal of oak trees on a small or large scale will be coordinated with the BRAC biologist prior to implementation, although removal of oak trees is not currently planned for this project. In areas where overhead tree canopy precludes the use of RTK-GPS, the towed array will collect data as close to trees and other obstructions as possible without sacrificing efficiency of data collection.

Where subsurface removal is required and DGM survey was not able to be conducted due to overhead tree canopies, removal will be conducted as analog “mag and dig” operations or as fiducially-positioned DGM utilizing a single, person-portable EM61-MK2A. If analog EM61-MK2A surveys are required, a local grid covering the area of investigation will be established using tape measures and ropes, with lanes spaced at 2.5-foot intervals. As the EM61-MK2A operator pulls the instrument along each lane, they will monitor the instrumental response on the hand-held data logger. When anomalous readings are displayed, the peak response will be located and marked with a pin flag, and the operator will continue down the line until the survey area has been completed.

During traditional subsurface MEC removal utilizing digital geophysical methods, the site is geophysically mapped using EM61 EMI sensors, supplemented by analog (mag and dig) removal in highly cluttered areas. Because these technologies do not provide a validated means to discriminate between MEC and nonhazardous metallic debris, the locations of all anomalies greater than the detection threshold are identified, reacquired, and excavated. Experience has shown that the majority of the cost and effort of subsurface MEC removals are associated with the excavation of non-MEC items. Recent research has resulted in the development of discrimination technologies to reduce the number of excavations of non-MEC items, thus reducing the cost of subsurface removals.

Advanced geophysical classification uses advanced EMI sensors and geophysical classifiers to estimate physical properties of detected metal items beneath the ground surface (such as size, aspect ratio, wall thickness, and symmetry) and determine whether each item is a target of interest (TOI) or non-TOI. Using this information in a structured decision-making process, the project team will be able to make informed decisions about whether an item should be excavated or can be left in place.

Depending on site-specific conditions and the goals and objectives of each individual activity, advanced geophysical classification may not be the most efficient technique or the best choice to meet individual project objectives. Advanced geophysical classification is an additional tool to be utilized in specific situations, but it will not replace standard MEC removal methods. The goal of the advanced geophysical classification work is to identify geophysical anomalies potentially representing MEC and to determine which of those anomalies require removal and which may be left in place. Advanced geophysical classification may be used to detect anomalies resulting from discarded military munitions (DMM), UXO, and other metallic debris and to classify those anomalies so that informed decisions can be made as to whether each anomaly is a TOI and should be removed or is a non-TOI and may be left in place. Geophysical detection data will be used to initially detect and document the locations of subsurface anomalies. If deemed appropriate by the project team for use at a specific site or area, geophysical data collected using advanced EMI sensors in a cued (static) mode will then be used to classify each anomaly as follows:

1. TOI (i.e., highly likely to be DMM or UXO)
2. Non-TOI (i.e., highly unlikely to be DMM or UXO)
3. Inconclusive

Detected items classified as “TOI” and “inconclusive” will be targeted for removal. Items classified as non-TOI will be left in place. The results of geophysical detection and classification and the subsequent intrusive investigation must meet established data quality objectives to complete the investigation. Standard procedures are outlined in the MEC QAPP.

6.8 Data Processing

Data processing includes verification of DGM data quality using the established QC metrics, assessment of the track path and spatial sample density, data correction and leveling, creation of data profiles and gridded pseudocolor maps, and anomaly selection, if required. NAEVA processing geophysicists will utilize vendor-supplied software and Geosoft Oasis Montaj to complete data processing tasks. DGM data processing and analysis procedures are summarized below, with details provided in GEO SOPS 5 and 6 of the MEC QAPP.

Initial processing and review of the DGM data will be accomplished by the data collection team using vendor-supplied software (Multi61MK2 for towed-array data and DAT61MK2 or

TrackMaker61MK2 for person-portable data) to convert the raw data files into a digital file formatted for import into Geosoft Oasis Montaj. The initial data review will also verify that the data satisfy data collection criteria and accurately represent spatial site conditions.

Upon initial import of the DGM data files into Geosoft Oasis Montaj, the processor will assess daily functional check data and DGM survey data to verify that project MQOs are successfully met. Data will be evaluated for quality, location, coverage, line path positioning, and down-line data density. After this pre-processing of the data has been completed and the data has been determined to be of sufficient quality, the processor will level the data to a common background, apply appropriate latency/lag corrections, apply any necessary filters, and grid the data. The processor will then generate profile line data and gridded images for interpretation.

6.9 Anomaly Selection

In areas of planned subsurface removal, anomalies potentially representing subsurface MEC will be identified and selected. Target selections will initially be made using automated selection routines, based on the sum of the four response channels recorded by the EM61-MK2A using a selection threshold of 14 millivolt (mV). The target anomaly selection threshold of 14mV is based on the 37mm projectile. Further discussion of the basis for the 14mV initial selection threshold is included in the MEC QAPP. Selected targets will be checked for validity and position, and additional characteristics, including anomaly footprint size and shape, signal to noise ratio, and decay-time constants, previous GPO and IVS results, blind seed information, and presence of surrounding anomalies, may be used to refine the anomaly selection process. Targets found to be invalid or incorrectly located will be adjusted or removed, and additional anomalies not selected by the automated routine, yet deemed to represent potential MEC sources, will be manually selected. A more detailed discussion of the interpretation and target selection process is presented in the MEC QAPP.

6.10 Anomaly Reacquisition

In areas of planned subsurface removal, reacquisition of geophysical anomalies for subsurface MEC removal will take place. Following dig sheet development, each anomaly will be reacquired using GPS. The location of each anomaly will be verified and refined, if necessary, by using an EM61-MK2A to locate the anomaly's peak response, using the recorded anomaly response value as a guide. A non-metallic pin flag marked with a unique anomaly identification will be placed at the anomaly's peak response location. Further details regarding anomaly reacquisition are provided in GEO SOP 7 of the MEC QAPP.

6.11 Intrusive Target Investigation and Verification

UXO Teams will intrusively investigate reacquired anomalies using procedures described in UXO SOP 4 of the MEC QAPP. Verification of intrusive anomaly investigation results is detailed in GEO SOP 8 of the MEC QAPP.

6.12 DGM QC

QC of the geophysical system includes daily functional checks conducted prior to the onset of DGM activities and throughout DGM operations to demonstrate that the data are of sufficient quantity and quality to meet the project objectives. The functional checks, which will be documented in the daily digital field notes, are outlined in the following list:

- Equipment warm-up
- GPS static position check
- Static background geophysical sensor check
- Static spike geophysical sensor check
- Dynamic background geophysical sensor check (IVS)
- Dynamic spike geophysical sensor check (IVS)
- Cable shake test
- Personnel test (person-portable EM61-MK2A only)
- Tow vehicle test (towed-array only)

Based on previous pre-project tests, data acquired at the IVS, and team experience in performing DGM at former Fort Ord and other MR projects, the following MQOs will be used to verify and document the functionality of the geophysical system:

GPS static position check: GPS position checks will not exceed +/- 3 inches (7.6 cm) from the established baseline position.

Static background geophysical sensor check: 98% of the daily static background response values (no test object) will not exceed +/- 2 mV of expected baseline response (for all EM61-MK2A channels).

Static spike geophysical sensor check: 98% of the response values to the standard test item (a small ISO fixed at an orientation and distance from the sensor to provide an approximately 100 mV response on channel 2 of the EM61-MK2A) will not exceed +/- 10% of the expected baseline response (for all EM61-MK2A channels).

Dynamic background geophysical sensor check (IVS): 98% of the dynamic background response values during the daily IVS survey will not exceed +/- 3 mV of expected baseline response (for all EM61-MK2A channels).

Dynamic spike geophysical sensor check (IVS): Instrument response to each IVS item will be within +/- 25% or +/- 2 mV (whichever is greater) of the expected baseline response

(for all EM61-MK2A channels). The baseline response for each IVS item will be the average of the instrument responses to that item measured during the first week of IVS surveys.

Cable shake test: 98% of response values will not exceed +/- 2 mV when system cables are moved (for all EM61-MK2A channels).

Personnel test (person-portable EM61-MK2A only): 98% of response values (due to proximity of data collection personnel) will not exceed +/-2 mV (for all EM61-MK2A channels).

Tow vehicle test (towed-array only): 98% of response values (due to elevated tow vehicle revolutions per minute [RPM]) will not exceed +/-2 mV (for all EM61-MK2A channels).

In addition to the daily functional checks listed above, the following quantitative criteria will be evaluated for all DGM data:

Along track sampling: 98% of the along track measurements in a dataset will be collected at a sampling rate less than or equal to 0.65 feet (20 cm).

Across track sampling:

Category A towed-array: The line spacing for the towed-array system is physically set by the array platform at 2 feet. At least 95% of Category A DGM lines will be spaced at 2 feet or less and 100% at 3 feet or less. There will be no unexplained data gaps.

Category A person-portable: The required line spacing for person-portable Category A geophysical mapping is 2 feet. At least 95% of Category A DGM lines will be spaced at 2 feet or less and 100% at 3 feet or less. There will be no unexplained data gaps.

Category B towed array: The line spacing for the towed-array system is physically set by the array platform at 2 feet. At least 95% of Category B DGM lines will be spaced at 2.5 feet or less and 98% at 3 feet or less.

Category B person-portable: The required line spacing for person-portable Category B geophysical mapping is 2.5 feet. At least 95% of Category B DGM lines will be spaced at 2.5 feet or less and 98% at 3 feet or less.

Survey speed: 95% of all measurements will be collected at a survey speed of 4 miles per hour or less.

GSV blind seed item sensor check: Instrument response to blind seed items (small ISOs buried vertically with their center of mass 6 inches bgs) for both towed-array and person-portable systems will be at least 75% of the baseline response. The baseline response will be determined by recording an additional survey line that is offset ½ of the planned survey line spacing (1 foot) from the center of the seeded IVS line. This offset line

will be recorded twice daily (am/pm) with the person-portable system(s) during the first week of IVS testing. The baseline mV response for blind seed items will then be calculated by averaging the peak readings for each ISO at this 1 foot offset measured during the first week of IVS testing.

GSV blind seed item position check: 90% of blind seed item locations in DGM data with RTK-GPS positioning will be within 10 inches (25 cm) + ½ survey line spacing and 100% will be within 14 inches (35 cm) + ½ survey line spacing of known seed item locations. 100% of blind seed item locations in DGM data with fiducial positioning will be within 20 inches (50 cm) + ½ survey line spacing of known seed item locations.

Category A – RTK-GPS positioning: 90% within 22 inches and 100% within 26 inches of known seed item locations.

Category A – Fiducial positioning: 100% within 32 inches of known seed item locations.

Category B – RTK-GPS positioning: 90% within 25 inches and 100% within 29 inches of known seed item locations.

Category B – Fiducial positioning: 100% within 35 inches of known seed item locations.

6.13 Reporting

DGM reporting requirements are provided in DATA SOP 4 of the MEC QAPP. Final DGM reporting, including delivery of all raw and final processed DGM data, will be included along with the TM and RAR prepared at the conclusion of the work.

SECTION 7 GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS

DATA SOP 2 of the MEC QAPP provides geospatial information and electronic submittal procedures to be implemented during the MEC remediation activities.

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SECTION 8 WORK, DATA, AND COST MANAGEMENT PLAN

The Work, Data, and Cost Management Plan for all work addressed by this SSWP will be developed in accordance with Worksheets 14 and 16 of the MEC QAPP. Site-specific revisions to this plan will include an updated work schedule as needed or directed by USACE.

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SECTION 9 PROPERTY MANAGEMENT PLAN

The following equipment and facilities are expected to be required for the project:

- Crew cab 4x4 Pickups
- Standard 4x4 Pickups
- Portable toilets
- RTK-GPS Systems
- EM61–MK2A Systems
- Towed arrays
- Schonstedt GA-52CXs
- Whites (DFX 300)
- Radios for UXO and DGM crews
- Water coolers or bottled water
- Signs and fencing materials for exclusion zones
- Bulldozer or other tow vehicle for towed arrays

Property management will be conducted in accordance with established project procedures.

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SECTION 10 QC PLAN

UXO SOP 10 and GEO SOP 8 of the MEC QAPP describe general project procedures to be implemented for analog and DGM QC tasks during MEC RAs. In addition, geophysical MQOs are provided in Section 6.12, DGM QC, of this SSWP. Details on specific QC procedures to be implemented are provided in the following sections.

The following Definable Features of Work (DFWs) and personnel responsible for the implementation of the three-phase inspection process have been identified for the fieldwork phase of this project:

- Perform vegetation removal as shown on Figures 5 and 6 (CQCSM),
- Grid and border survey (CQCSM),
- QC seeding program (UXOQCS),
- Technology-aided surface MEC removal (CQCSM),
- DGM survey (CQCSM),
- 10% analog QC inspection (UXOQCS),
- Subsurface MEC removal (CQCSM),
- MEC/MPPEH detonation (UXOQCS),
- MPPEH, MD, and scrap segregation, reporting, and disposition (UXOQCS), and
- Site restoration and erosion control (CQCSM).

The CQCSM will independently verify that inspections are effectively implemented. The CQCSM will also plan, perform, and document preparatory meetings, preparatory inspections, initial inspections, follow-up inspections, and completion inspections in coordination with the Government QA representative.

10.1 QC Process

10.1.1 Detection Performance Goals

A QC survey will be performed by the UXOQCS following completion of surface and subsurface removal grids. Location of any MEC or MD item that could be mistaken for MEC will constitute a QC grid failure. Location of any metallic object the size of an LE, MK1, 37mm projectile (without fuze) [1.47” x 1.47” x 3.5"] or larger will constitute a QC grid failure.

Following DGM in surface removal areas, a sample of detected anomalies will be checked in the field to verify that the DGM anomalies have subsurface sources and are not actually related to surface items. This work will be conducted by KEMRON and the results presented to USACE.

A corrective action request (CAR) will be promptly developed if a grid QC failure occurs to investigate the grid failure root cause. Corrective action may include a grid re-inspection process. Actions to prevent future recurrence will be based on the root cause but may include additional procedure controls, more rigorous UXOQCS field surveillance, and additional training. Corrective measures processes are provided in the MEC QAPP.

10.1.2 Analog QC Inspection

As MEC removal activities are completed in each removal grid, KEMRON's UXOQCS will conduct a QC survey with a Schonstedt GA-52CX magnetometer over 10% of each removal grid. Within areas where surface MEC removals were conducted, the UXOQCS will perform technology-aided visual surface surveys as part of the inspection. Within areas where subsurface MEC removal activities were conducted, the UXOQCS will intrusively investigate anomalies if detected during the 10% QC sweep. Results of these investigations will be provided in the QC daily log. Analog QC procedures are provided in UXO SOP 10 of the MEC QAPP.

10.1.3 DGM MQOs

As part of the DGM QC program, MQOs will be monitored during the course of mapping activities. These MQOs provide a means to quantify the quality of the data collected during DGM surveys. Metrics associated with the MQOs are provided in Section 6 of this SSWP. If these metrics are exceeded, a root-cause analysis will be developed and a CAR submitted.

10.1.4 Instrument Standardization

Daily standardization procedures and functional checks will be performed on all geophysical instruments and monitored as described in Section 6 of this SSWP and the MEC QAPP.

10.1.5 Quality Control Seeding Program

A QC seeding program will be implemented for both analog and DGM surveys. QC seed items will be placed in areas where technology-aided surface MEC removal, subsurface MEC removal and DGM survey are planned. QC seed items will be placed such that each team encounters, on average, at least one seed item per day of data collection. The seed item density will be increased to an average of two seed items encountered per day in areas where DGM surveys will be conducted utilizing fiducial positioning methods. QC seed items will be placed on the surface and in the subsurface based on project objectives and will be representative of items expected within the project area. QC seed item characteristics will be specified prior to placement. All seeds will be located using GPS.

Further details, including MQOs for blind seed item detection and identification, are provided in Section 5 of this SSWP and in GEO SOP 2 of the MEC QAPP.

10.2 Quality Assurance Operations

QA will be provided by the USACE to assure that KEMRON's QC system is functioning as stated. Areas of QA include:

- Monitor contractor field practices, including announced and extemporaneous, unobtrusive observations.
- Review and observe field ground control and GPS procedures. This is meant to avoid geo-referencing incompatibilities between KEMRON and the USACE.
- Independently examine data files and anomaly maps. The USACE OESS will check the database against Team Leader grid sheets to ensure all anomalies flagged were excavated.
- Independently conduct technology-aided surface MEC surveys over a minimum of 10% of each of the grids where technology-aided surface MEC removal is conducted.
- Independently conduct analog QA over a minimum 10% of each of the grids where an analog subsurface removal is performed.
- Independently conduct DGM QA, which may include 3 to 5% digital resurvey. May also include QA seeding and/or QA digs.

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SECTION 11 ENVIRONMENTAL PROTECTION PLAN

This section describes the procedures to be employed to protect natural resources during the MEC remediation activities addressed in this SSWP. It includes a description of the natural resources present, and a list of mitigation measures appropriate to the type of work activity and the habitat types, that will be implemented to reduce impacts to these resources whenever possible. Field SOP 2 of the MEC QAPP also describes general project procedures to be implemented for environmental protection.

BLM Area B is within the NRMA which is designated as undeveloped habitat reserve, as described in the HMP. The HMP describes special land restrictions and habitat management requirements within habitat reserve areas. Habitat reserve areas support plant and animal species protected under the Endangered Species Act; implementation of mitigation measures identified in the HMP are required to minimize potential adverse impacts to listed species. Chapter 3 of the HMP describes mitigation measures that must be implemented during MEC investigation and remediation. In addition, the Programmatic Biological Opinion (BO) (United States Fish and Wildlife Service [USFWS], 2015) contains terms and conditions and reasonable and prudent measures that need to be implemented during MEC activities to minimize and reduce impacts to protected species.

11.1 Description of Site and Natural Resources

Habitat types occurring within BLM Area B are primarily CMC, with some areas of oak woodland and grassland. CMC is a dominant habitat type at former Fort Ord and is identified as a protected plant community in the HMP. Additionally, several vernal ponds and the associated wetlands are present that are also protected in the HMP.

The habitat types present within BLM Area B are known or have the potential to contain special-status flora and faunal species identified in the HMP. Species that may be encountered within CMC are:

- HMP annual plants
- Sand gilia (*Gilia tenuiflora arenaria*) – Federal Endangered (FE), State Threatened (ST)
- Monterey spineflower (*Chorizanthe p. pungens*) – Federal Threatened (FT)
- Coast wallflower (*Erysimum ammophilum*),
- Contra Costa goldfields (*Lasthenia conjugens*) - FE
- HMP perennial plants
- Yadon's piperia (*Piperia yadonii*) - FE

- Hooker's manzanita (*Arctostaphylos h. hookeri*),
- Sandmat manzanita (*A. pumila*),
- Monterey manzanita (*A. montereyensis*),
- Monterey Ceanothus (*Ceanothus rigidus*),
- Eastwood's golden bush (*Ericameria fasciculata*).
- HMP wildlife species
- Black legless lizards (*Anniella pulchra nigra*)
- California Tiger Salamander (CTS) (*Ambystoma californiense*) – FT, ST

Black legless lizards could be encountered in any areas with sandy soils. CTS may be encountered, as Ponds 42 and 60 are known breeding habitat, and upland and dispersal habitat occur within BLM Area B.

11.2 Protection of Natural Resources

Measures to reduce impacts to natural resources will be implemented in accordance with the HMP and the Programmatic BO (USFWS, 2015). These measures are described in Field SOP 2 of the MEC QAPP and include:

- Employee environmental training,
- Preparation of habitat checklists,
- Avoiding and reducing impacts to HMP plants and habitats,
- Avoiding impacts to CTS and black legless lizards,
- Replacement of topsoil when feasible,
- Implementation of Best Management Practices to reduce the spread of invasive weeds,
- Restricted vehicle access, and
- Monitoring of erosion and invasive weeds during and after remedial activities.

SECTION 12 REFERENCES

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Tables

Table 1 - MEC Items Previously Recovered
and Range of Depths in and around BLM Area B Sub-Areas B-2A and B-3

Model Description	Range in Depth BGS (inches)	MEC Type	Quantity	Location
Ordnance Components	48	UXO	4	Buffer
Base, coupling, firing device	3	UXO	2	RWA B
Cap, blasting, electric, M6	0-12	UXO	3	Buffer
Cap, blasting, non-electric, M7	48	UXO	1	Buffer
Charge, 0.25lbs, demolition, TNT	6	UXO	1	Buffer
Firing device, pressure, M1A1	12	UXO	2	Buffer
Firing device, pull, M1	8-12	UXO	19	Buffer
Firing device, pull, M1	12	UXO	1	RWA A
Firing device, pull friction, M2	6	UXO	1	Buffer
Firing device, release, M5	12	UXO	4	Buffer
Flare, parachute, trip, M48	40	UXO	1	Buffer
Flare, surface, trip, M49 series	0-48	UXO	15	Buffer
Flare, surface, trip, M49 series	1	UXO	1	RWA B-2A
Flare, surface, trip, M49 series	0	UXO	1	RWA B
Fuze, grenade, hand, practice, M205 series	1-6	DMM	5	Buffer
Fuze, grenade, hand, practice, M205 series	1	UXO	1	RWA B-2A
Fuze, grenade, hand, practice, M205 series	8	DMM	50	RWA B
Fuze, grenade, hand, practice, M228	1	DMM	2	Buffer
Fuze, grenade, hand, practice, M228	18	UXO	15	RWA B3-E
Fuze, mine, antitank, practice, M604	1	UXO	1	Buffer
Fuze, projectile, point detonating, M8	3	UXO	1	Buffer
Grenade, hand, practice, MK II	0-24	UXO	5	Buffer
Grenade, hand, riot, CS, M7A3	1-4	UXO	4	Buffer
Grenade, hand, riot, CS-1, ABC-M25A2	0	UXO	1	RWA B
Grenade, hand, smoke, HC, AN-M8	3-6	UXO	2	Buffer
Grenade, hand, smoke, M18 series	3-6	UXO	3	Buffer
Grenade, hand, smoke, M18 series	4	DMM	1	Buffer
Grenade, hand, fragmentation, M67	0-6	UXO	2	Buffer
Grenade, hand, fragmentation, MK II	0-12	UXO	15	Buffer
Grenade, hand, fragmentation, MK II	0	UXO	1	RWA B-2A
Grenade, hand, Illumination, MK I	4-6	UXO	2	Buffer
Grenade, rifle, smoke, M22 series	4	UXO	1	Buffer
Grenade, rifle, smoke, M22 series	0	UXO	1	RWA B-2A
Igniter, time fuse, blasting, M60	12	UXO	1	Buffer
Mine, antipersonnel, practice, M8 series	0	DMM	1	RWA B
Mine, antitank, practice, M10	24	UXO	1	Buffer
Pot, 2.5lb, smoke, HC, screening, M1	0	UXO	1	RWA B
projectile, 3inch, stokes mortar, prac, MK I	3-30	UXO	21	Buffer
Projectile, 37mm, high explosive, MK II	6	UXO	1	Buffer
Projectile, 37mm, low explosive, MK I	3-5	UXO	4	Buffer
Projectile, 37mm, low explosive, MK I	1	UXO	1	RWA B-3W
Projectile, 40mm, parachute, M583 series	24	UXO	1	Buffer
Projectile, 60mm, mortar, high explosive, M49 series	18	UXO	1	RWA B
Projectile, 60mm, mortar, high explosive, M49 series	3-12	UXO	9	Buffer
Projectile, 60mm, mortar, high explosive, M49 series	3	UXO	1	RWA B-3E
Projectile, 75mm, Shrapnel, MK I	8	UXO	1	Buffer
Projectile, 81mm, mortar, high explosive, M362	4	UXO	1	Buffer
Projectile, 81mm, mortar, high explosive, M43 series	1-12	UXO	7	Buffer
Rocket, 2.36inch, high explosive antitank, M6	0-18	UXO	12	Buffer
Rocket, 2.36inch, high explosive antitank, M6	4	UXO	1	RWA A
Rocket, 4.5inch, barrage, high explosive, MK III	8-9	UXO	3	Buffer
Rocket, 35mm, subcaliber, practice, M73	0	UXO	1	Buffer

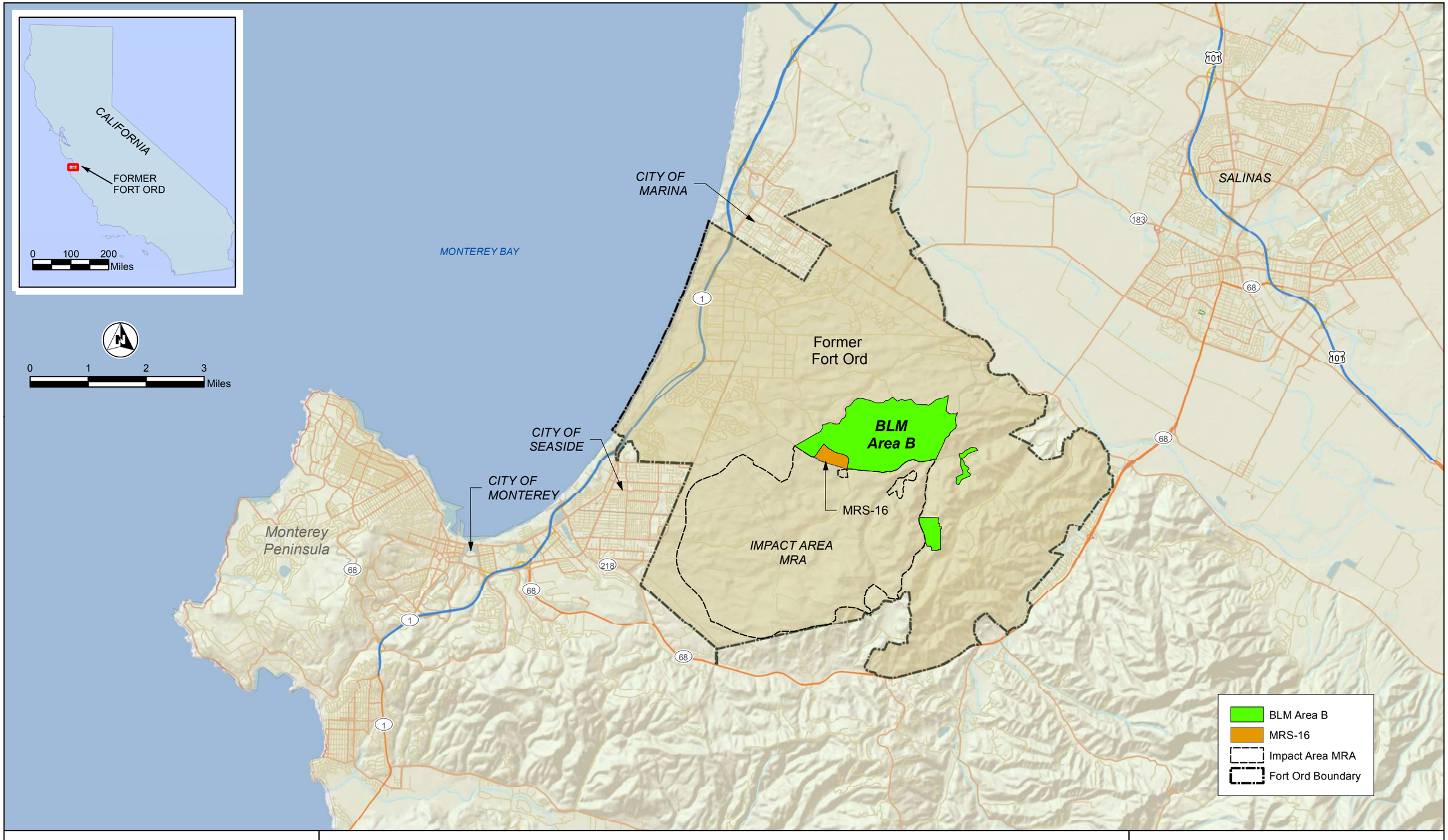
Table 1 - MEC Items Previously Recovered
and Range of Depths in and around BLM Area B Sub-Areas B-2A and B-3

Model Description	Range in Depth BGS (inches)	MEC Type	Quantity	Location
Signal, ground, rifle, parachute, M17 series	4	UXO	1	RWA B-2A
Signal, ground, rifle, parachute, M17 series	3	DMM	1	Buffer
Signal, illumination, ground, M125 series	0	UXO	1	Buffer
Signal, illumination, ground, M126 series	2-12	UXO	6	Buffer
Signal, illumination, ground, M126 series	0	UXO	1	RWA B-2A
Signal, illumination, ground, parachute, M19 series	3-24	UXO	3	Buffer
Simulator, detonation, explosive, M80	1-3	UXO	2	Buffer
Simulator, launching, antitank guided missile and rocket, M22	48	UXO	1	Buffer
Simulator, projectile, ground burst, M115A2	0	UXO	1	Buffer
Simulator, projectile, airburst, M74 series	4	UXO	1	Buffer
Simulator, projectile, airburst, M74 series	0	UXO	1	RWA B
Squib, electric	2	UXO	1	Buffer
Projectile, 81mm, mortar, practice, M43 series	27	UXO	1	RWA B
Projectile, 81mm, mortar, practice, M43 series	5-13	UXO	9	Buffer
Activator, mine, antitank, practice, M1	8	UXO	1	Buffer
Cartridge, ignition, M2 series	6	DMM	1	Buffer
Grenade, rifle, high explosive antitank, M28	20	UXO	1	Buffer
Ash, Pyrotechnic	0-3	UXO	4	Buffer
Grenade, Rifle (model unknown)	0	UXO	1	RWA B-2A

Acronym List
MEC - Munitions and Explosives of Concern
UXO - Unexploded Ordnance
DMM - Discarded Military Munitions
RWA - Remedial Work Area

Note: Buffer referenced in Location Column is 200 foot buffer around BLM Area B Sub-Area B-2A and B-3

Figures



Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 1

Regional Location Map
BLM Area B

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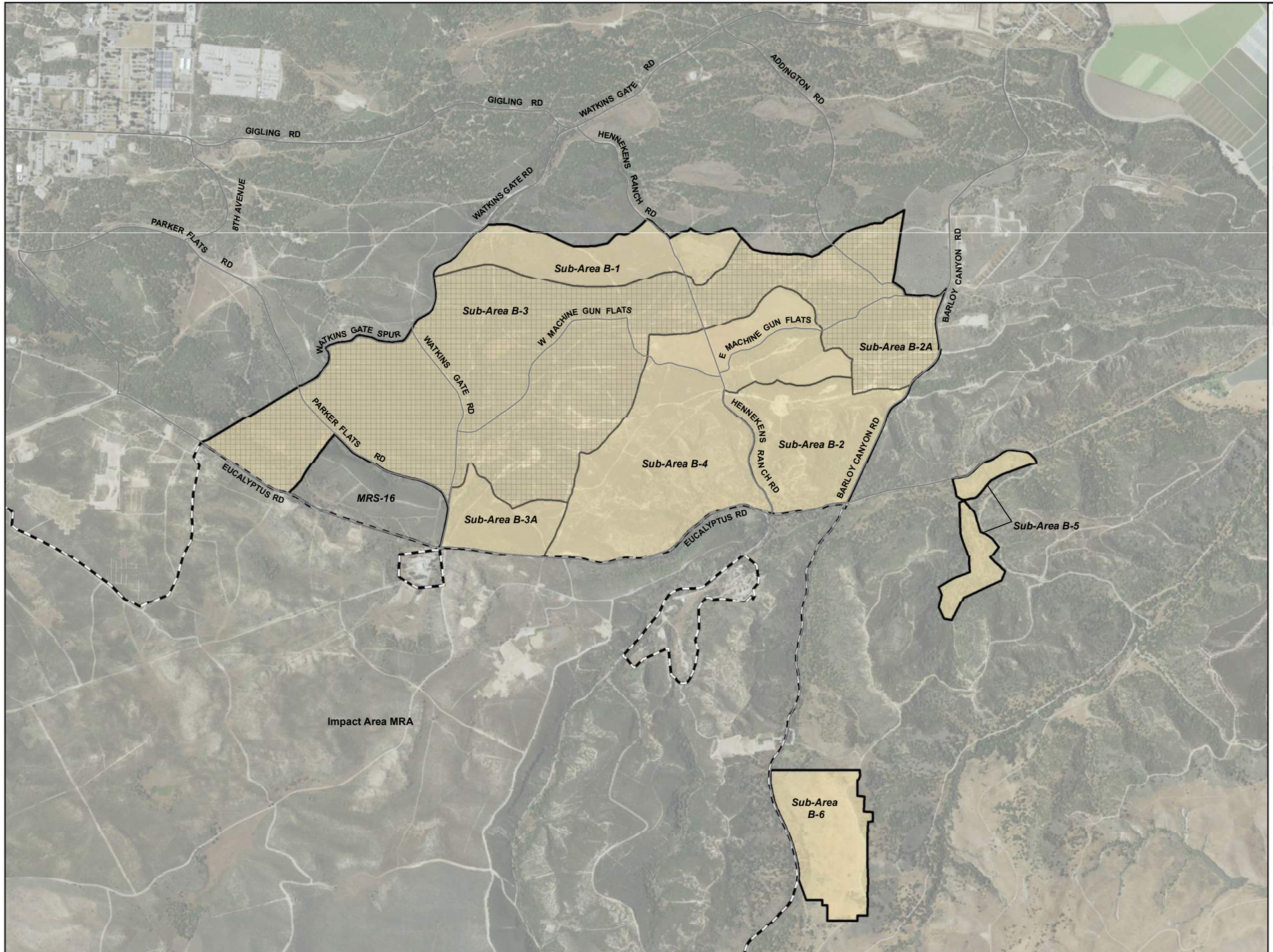

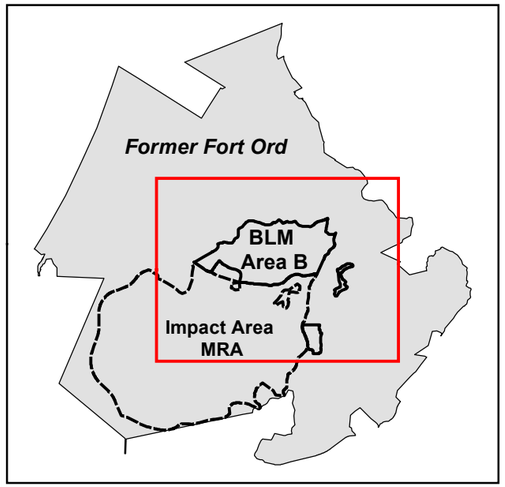

RI/FS Sub-Area (B1 thru B6)

Remedial Work Grid (Sub-Areas B-2A and B-3)

Impact Area MRA

BLM Area B

N

2,000 1,000 0 2,000

Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 2

BLM Area B RI/FS Sub-Areas

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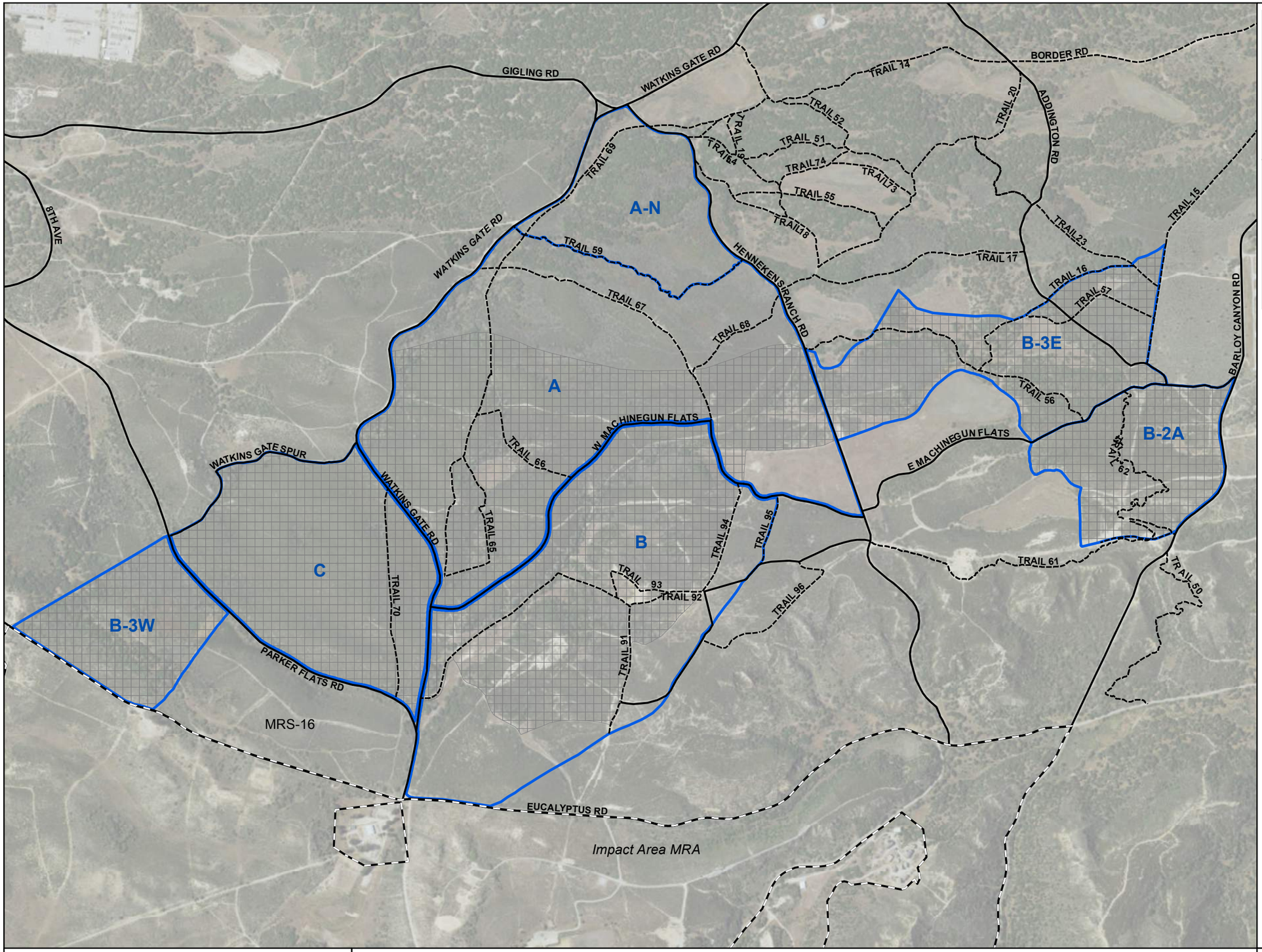

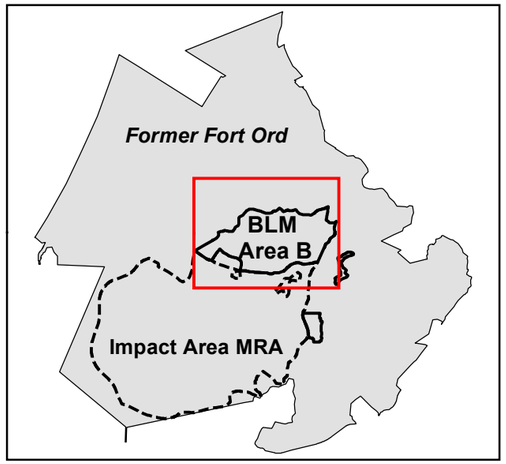

- Trail
- Road
- Remedial Work Area (Prescribed Burning or Cutting)
- Remedial Work Grid
- Impact Area

N

1,200 600 0 1,200
Feet

Site Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 3

BLM Area B Work Areas and
Existing BLM Trails

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*Only MEC within the remedial work area (Subareas B-2A and B-3) and it's 200 foot buffer are shown.

WATKINS GATE SPUR

WATKINS GATE RD

PARKER FLATS RD

W MACHINE GUN FLATS

HENNEKENS RANCH RD

E MACHINE GUN FLATS

ADDINGTON RD

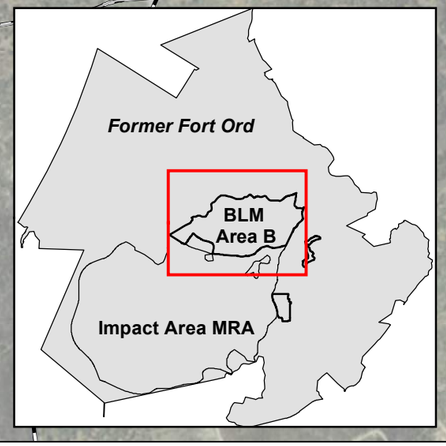
BARLOY CANYON RD

MRS-16

EUCALYPTUS RD

Impact Area MRA

0 600 1,200 2,400 Feet



MEC*

- Projectile, 40mm, parachute, M583 series
- Cap, blasting, electric, M6
- Grenade, Rifle (model unknown)
- Ash, Pyrotechnic
- Base, coupling, firing device
- Cartridge, ignition, M2 series
- Firing device, pressure, M1A1
- Firing device, pull, M1
- Firing device, release, M5
- Flare, parachute, trip, M48
- Flare, surface, trip, M49 series
- Fuze, grenade, hand, practice, M205 series
- Fuze, grenade, hand, practice, M228
- Fuze, mine, antitank, practice, M604
- Fuze, projectile, point detonating, M8
- Grenade, hand, Illumination, MK I
- Grenade, hand, fragmentation, MK II
- Grenade, hand, practice, MK II
- Grenade, hand, riot, CS, M7A3
- Grenade, hand, riot, CS-1, ABC-M25A2
- Grenade, hand, smoke, HC, AN-M8
- Grenade, hand, smoke, M18 series
- Grenade, rifle, high explosive antitank, M28
- Grenade, rifle, smoke, M22 series
- Mine, antipersonnel, practice, M8 series
- Mine, antitank, practice, M10
- Ordnance Components
- Pot, 10lb, smoke, HC, screening, M1
- Pot, 2.5lb, smoke, HC, screening, M1
- Projectile, 3inch, Stokes mortar, prac, MK I
- Projectile, 20mm, high explosive incendiary, M56A3
- Projectile, 37mm, high explosive, MK II
- Projectile, 37mm, low explosive, MK I
- Projectile, 60mm, mortar, high explosive, M49 series
- Projectile, 75mm, Shrapnel, MK I
- Projectile, 81mm, mortar, high explosive, M362
- Projectile, 81mm, mortar, high explosive, M43 series
- Projectile, 81mm, mortar, practice, M43 series
- Projectile, 81mm, mortar, training, M68
- Rocket, 2.36inch, high explosive antitank, M6
- Rocket, 35mm, subcaliber, practice, M73
- Rocket, 4.5inch, barrage, high explosive, MK III
- Signal, ground, rifle, parachute, M17 series
- Signal, illumination, ground, M125 series
- Signal, illumination, ground, M126 series
- Signal, illumination, ground, parachute, M19 series
- Simulator, flash artillery, M110
- Simulator, launching, antitank guided missile and rocket, M22
- Simulator, projectile, airburst, M74 series
- Simulator, projectile, ground burst, M115A2
- Impact Area MRA
- 200 foot buffer
- Remedial Work Area (Sub-areas B-2A and B-3)

Site Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 4

MEC Recovered as Part of Previous Actions

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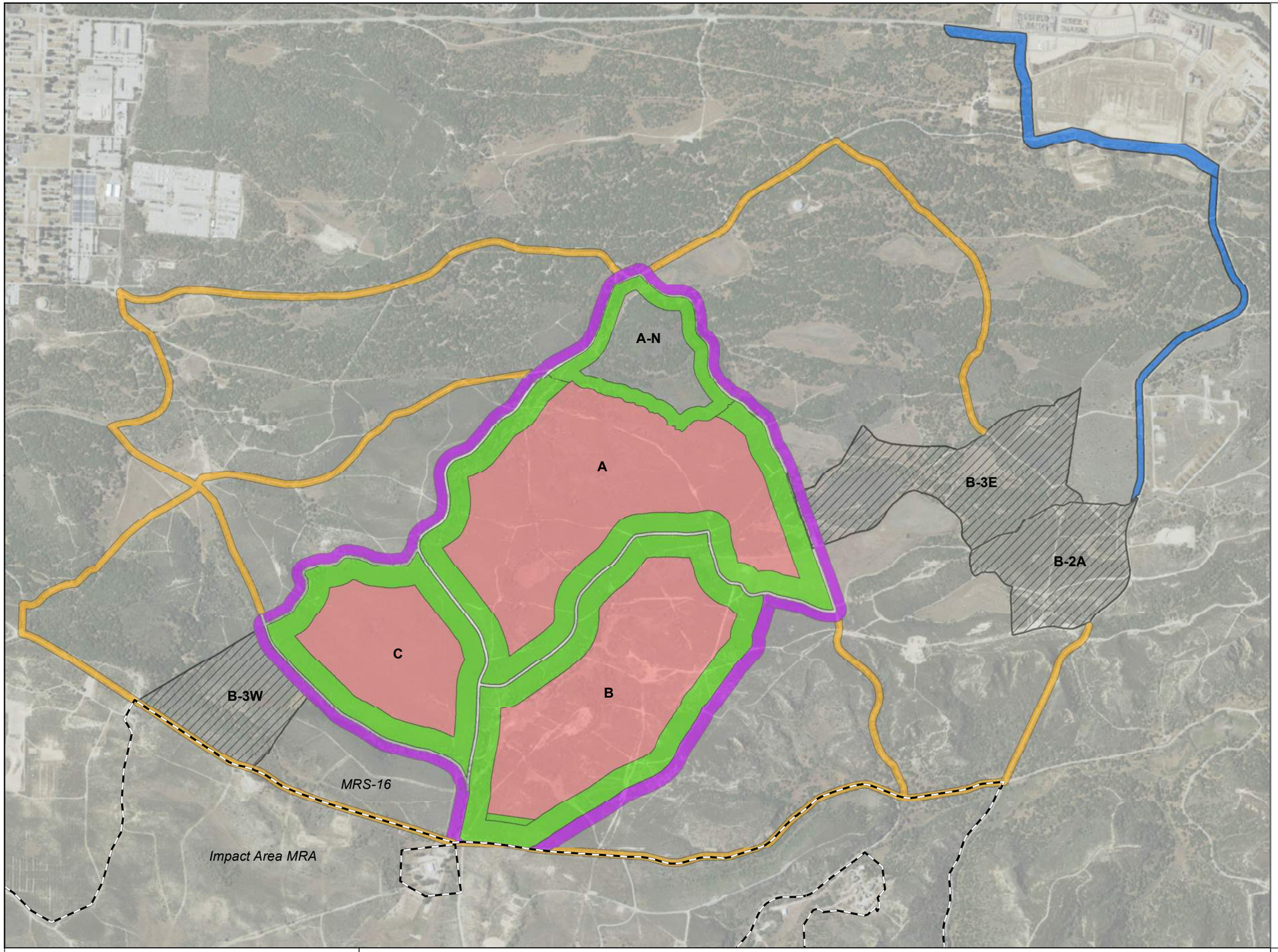

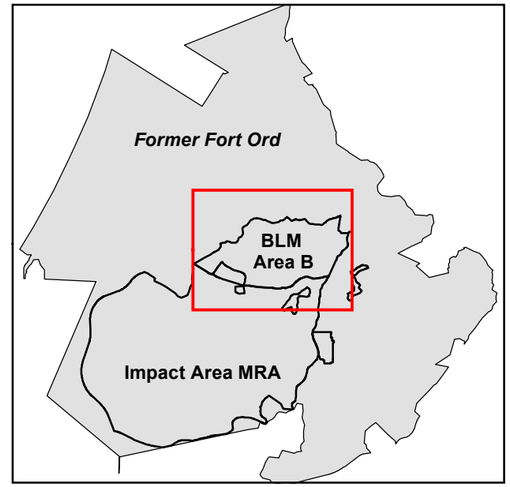

- Burn Remedial Work Area
- Primary Containment Line (area to be cut)
- Secondary Containment (area to be cut 50' each side of road)
- Tertiary Containment (area to be cut)
- Additional Containment (area to be cut)
- Cut Remedial Work Area
- Impact Area MRA

Total Areas:
Work Area A - 325 Acres
Work Area B - 258 Acres
Work Area C - 145 Acres

1,500 0 1,500
Feet

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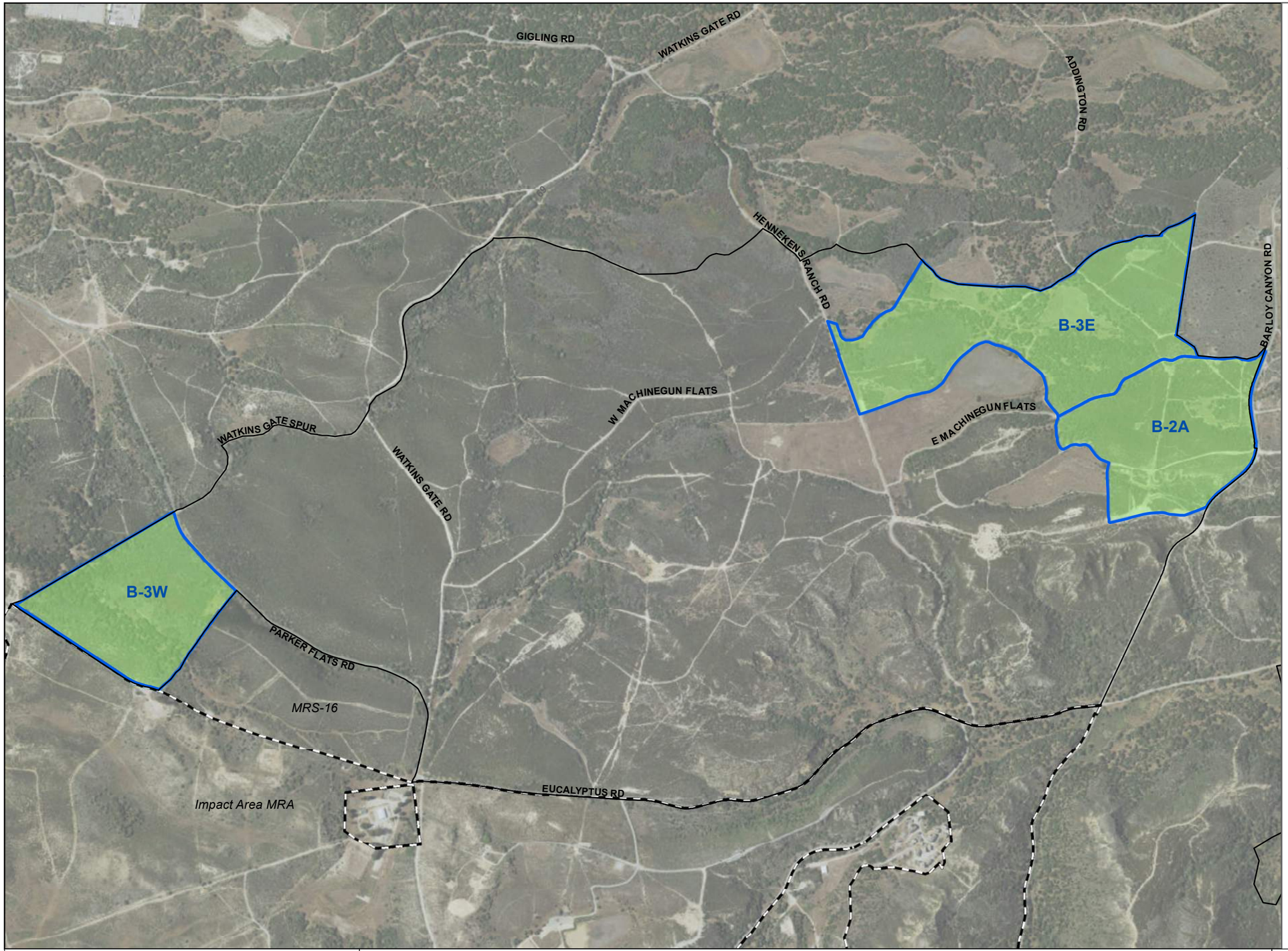
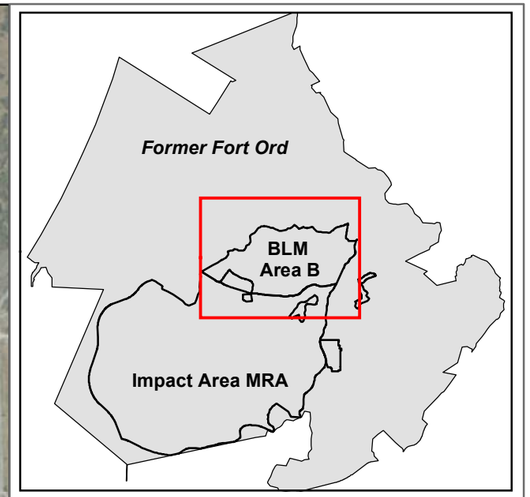
Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5

BLM Area B Mastication/Vegetation Removal Plan in Support of Prescribed Burns

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\BLM\Area_B\SSWP\Map_Docs\Rev1\Figure_5_Mastication_plan.mxd 3/28/2017 [11:02 AM] LCARR, Gilbane





Impact Area MRA

Vegetation Cut RWA

N

0 1,200 2,400

Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 6
BLM Area B Mastication/Vegetation Removal Plan
in Support of Surface MEC Removal
and DGM Survey in Cut Only Remedial Work Areas

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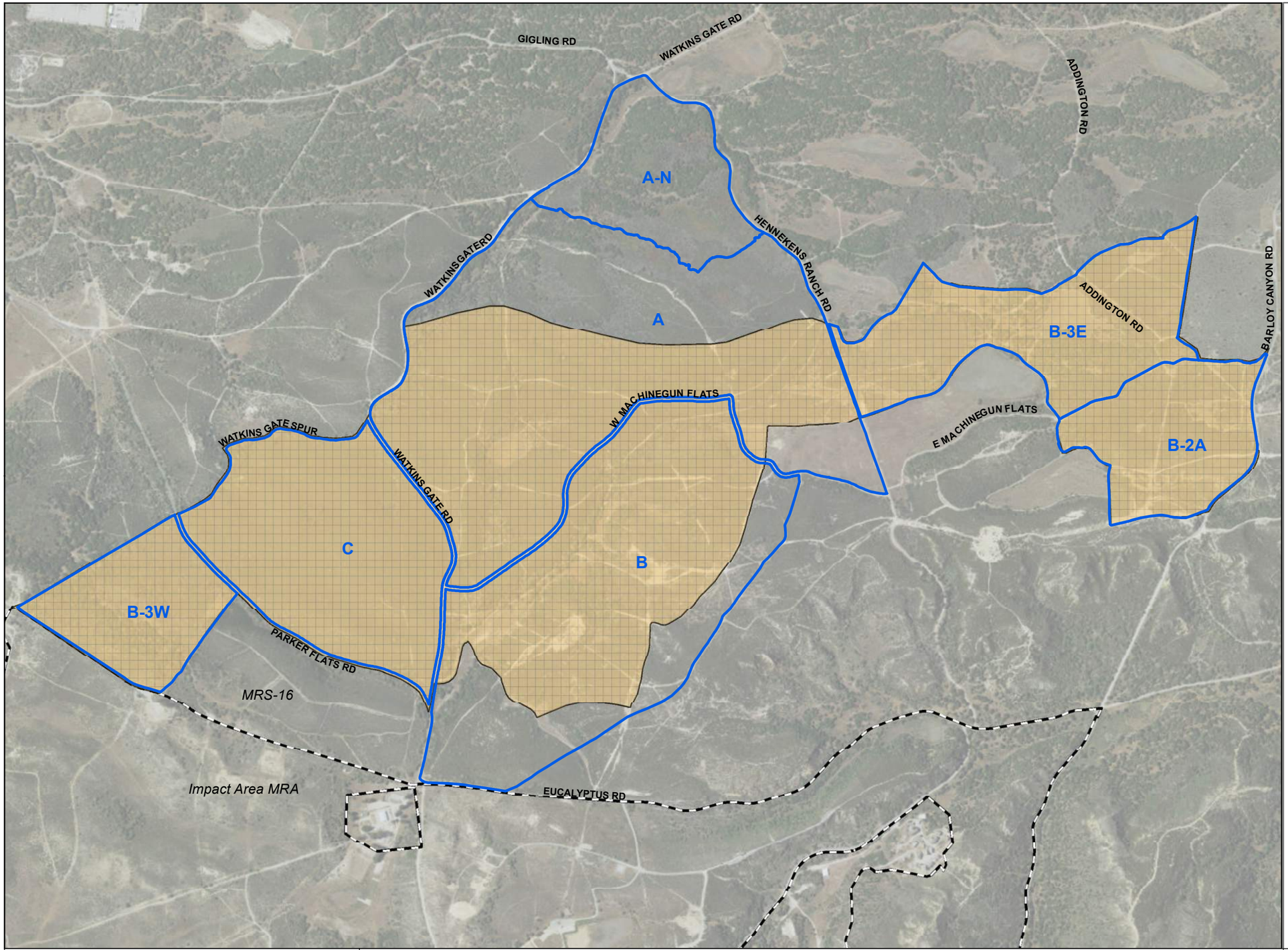

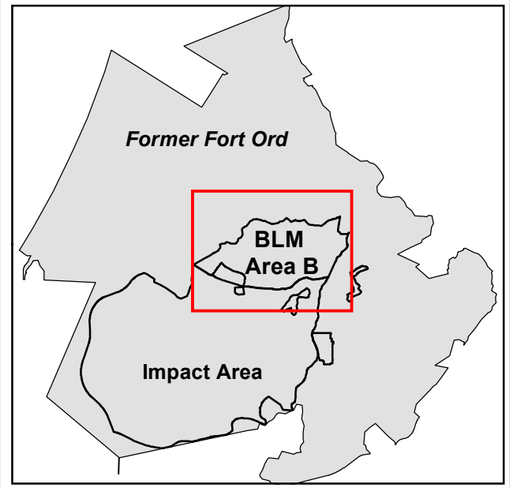

Remedial Work Area (Prescribed Burn or Cutting)

Surface Removal and DGM Work Grids (Remedial Work Area Grid)

Remedial Work Area (Sub-Areas B-2A/B-3)

Impact Area MRA

0 1,200 2,400 Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 7

BLM Area B Work Area Surface MEC Removal and DGM Grids

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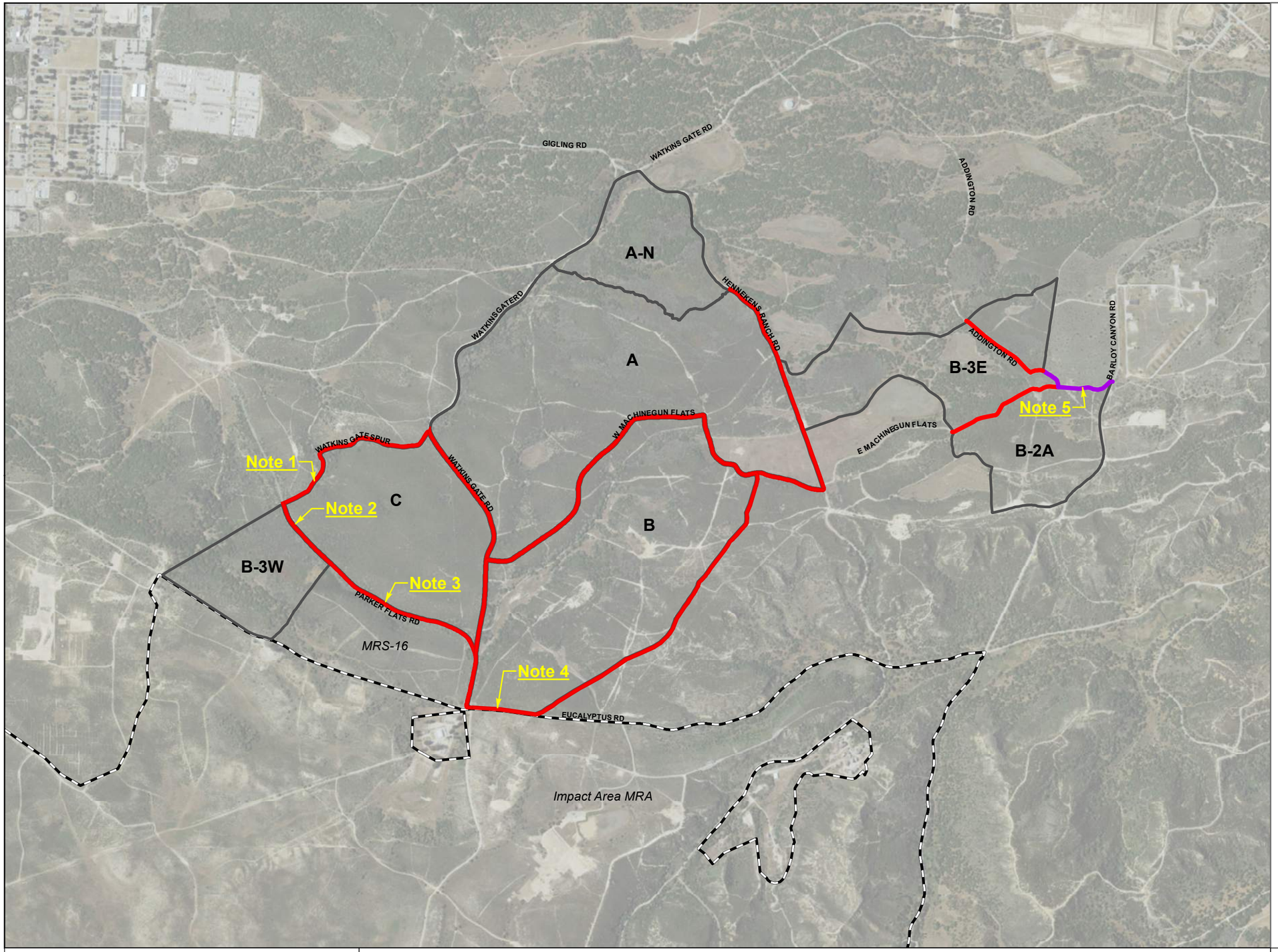

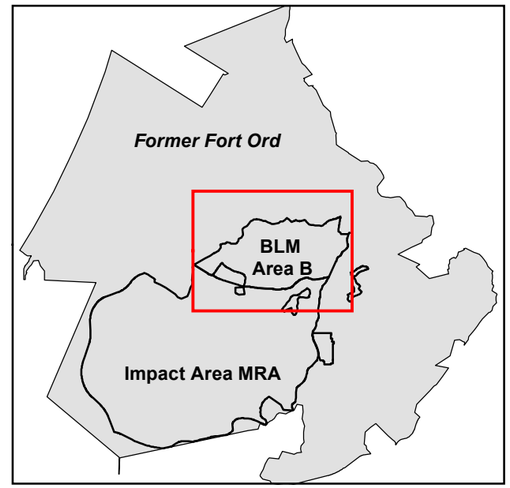

Fuel Break - Subsurface Removal

- 45 Foot Width
- 30 Foot Width
- Vegetation Removal Area (Prescribed Burn or Cutting)
- Impact Area MRA

Notes:

1) Perimeter Road (Watkins Gate Spur): Subsurface removal, 45 feet wide: 15 feet width of road, plus 30 feet width on southeast side of road.

2) Subsurface removal 15 feet width on either side of Parker Flats Rd, west of MRS-16.

3) Subsurface removal 15 feet width on north side of Parker Flats Rd, east of B-3W

4) Subsurface removal 15 feet width on north side of Eucalyptus Rd

5) 30 feet includes 15 feet of Addington Rd footprint and 15 feet adjacent into B-3E and B-2A (south/southwest side of Addington Rd)

N

1,200 0 1,200
Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 8

BLM Area B Subsurface MEC Removal in Permanent Fuel Breaks

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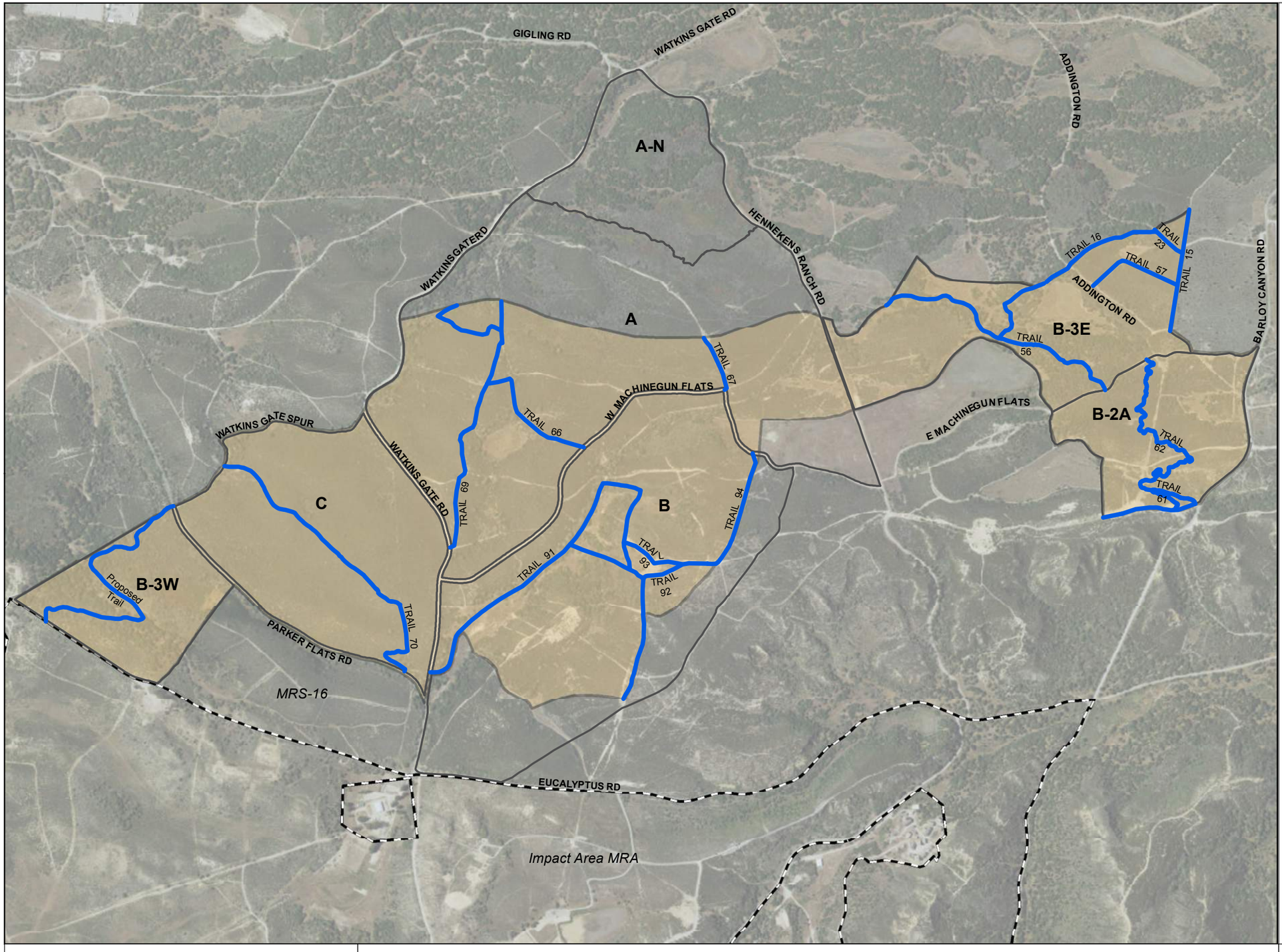

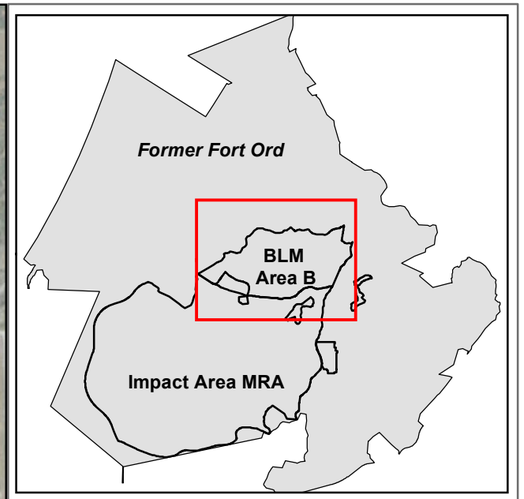

Subsurface Removal Areas, Existing and proposed trails - 12 Foot Width

Vegetation Removal Area (Prescribed Burn or Cutting)

Remedial Work Area

Impact Area MRA

1,200 0 1,200 Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 9

BLM Area B Subsurface
MEC Removal Areas - Existing and Proposed Trails

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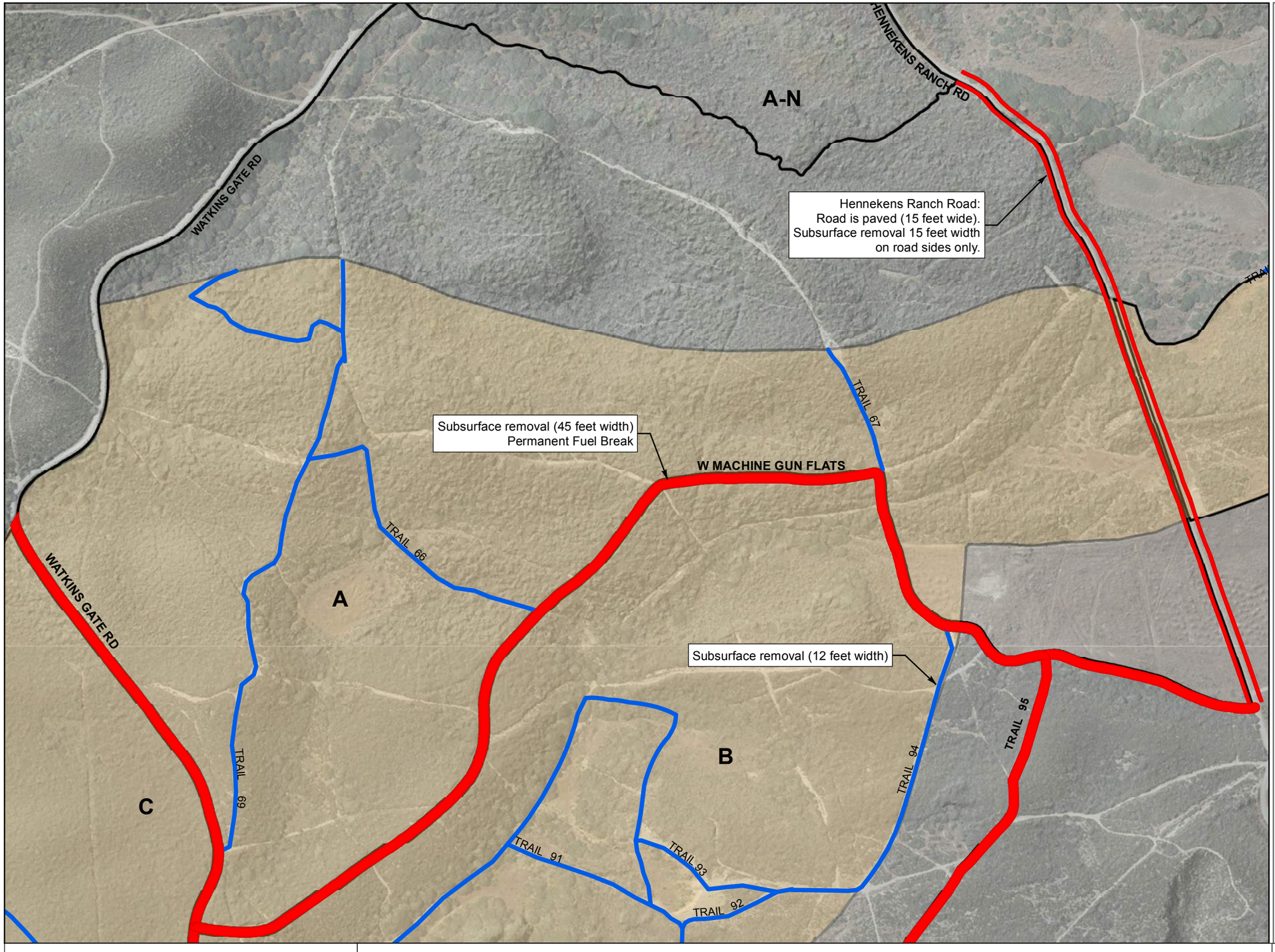

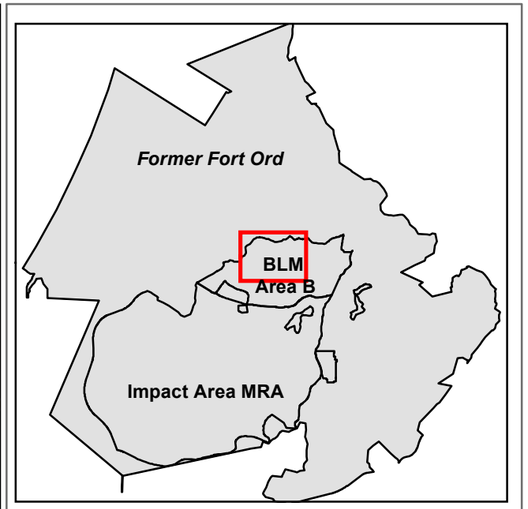

- Subsurface Removal Area - 45 foot width (Permanent Fuel Break)
- Subsurface Removal Areas, Existing and proposed trails - 12 Foot Width
- Remedial Work Area
- Vegetation Removal Area (Prescribed Burn or Cutting)

500 0 500 Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 10a

BLM Area B Subsurface MEC Removal Areas
(Remedial Work Area A)

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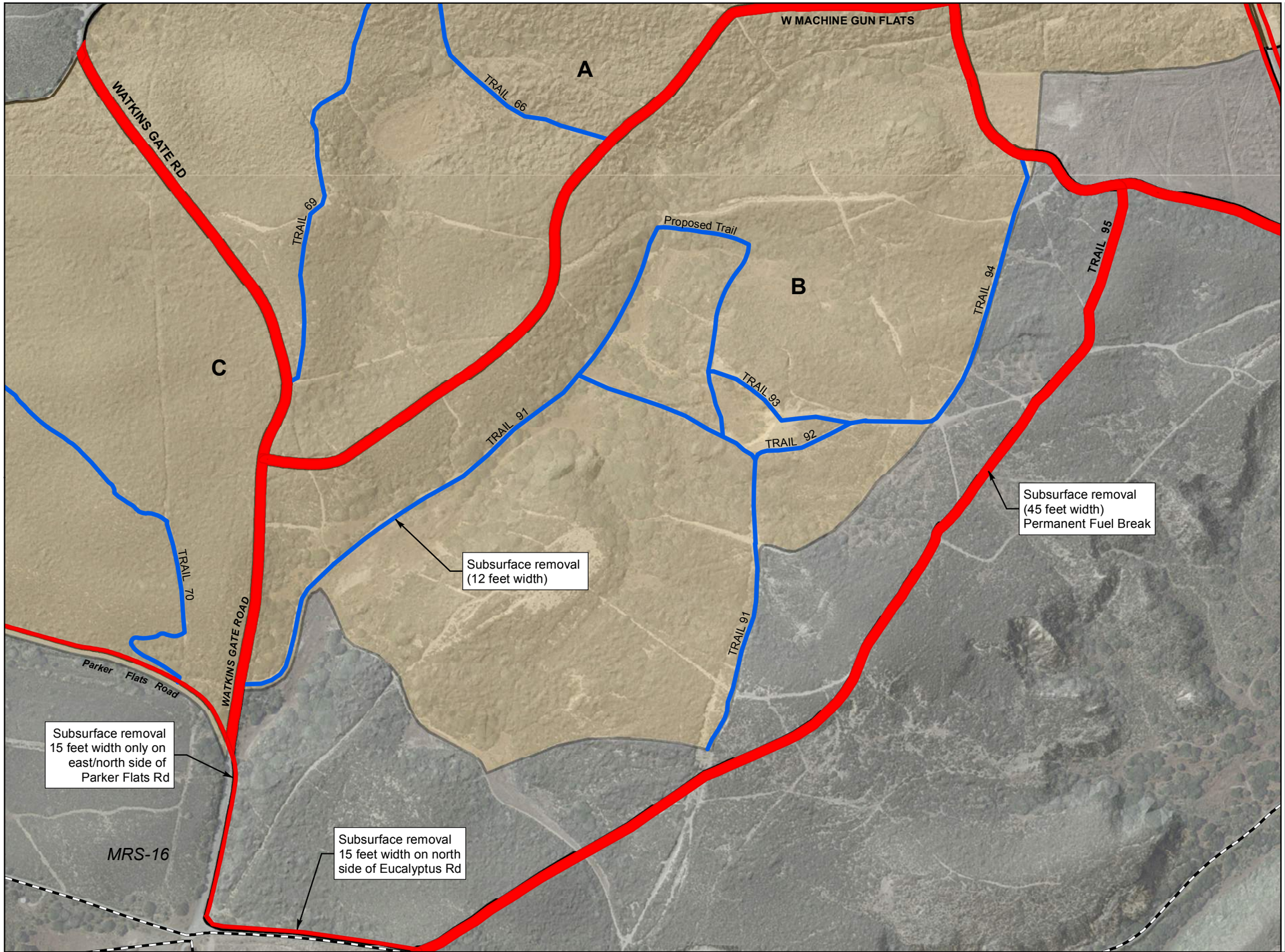

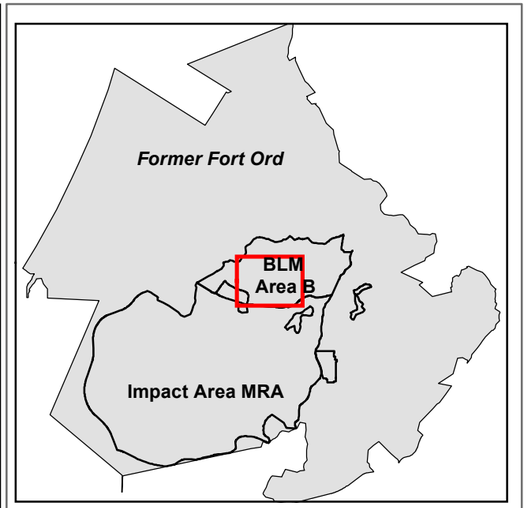

Subsurface Removal Area - 45 foot width (Permanent Fuel Break)

Subsurface Removal Areas, Existing and proposed trails - 12 Foot Width

Remedial Work Area

Vegetation Removal Area (Prescribed Burn or Cutting)

Impact Area MRA

N

500 0 500 Feet

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Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 10b

BLM Area B Subsurface MEC Removal Areas
(Remedial Work Area B)

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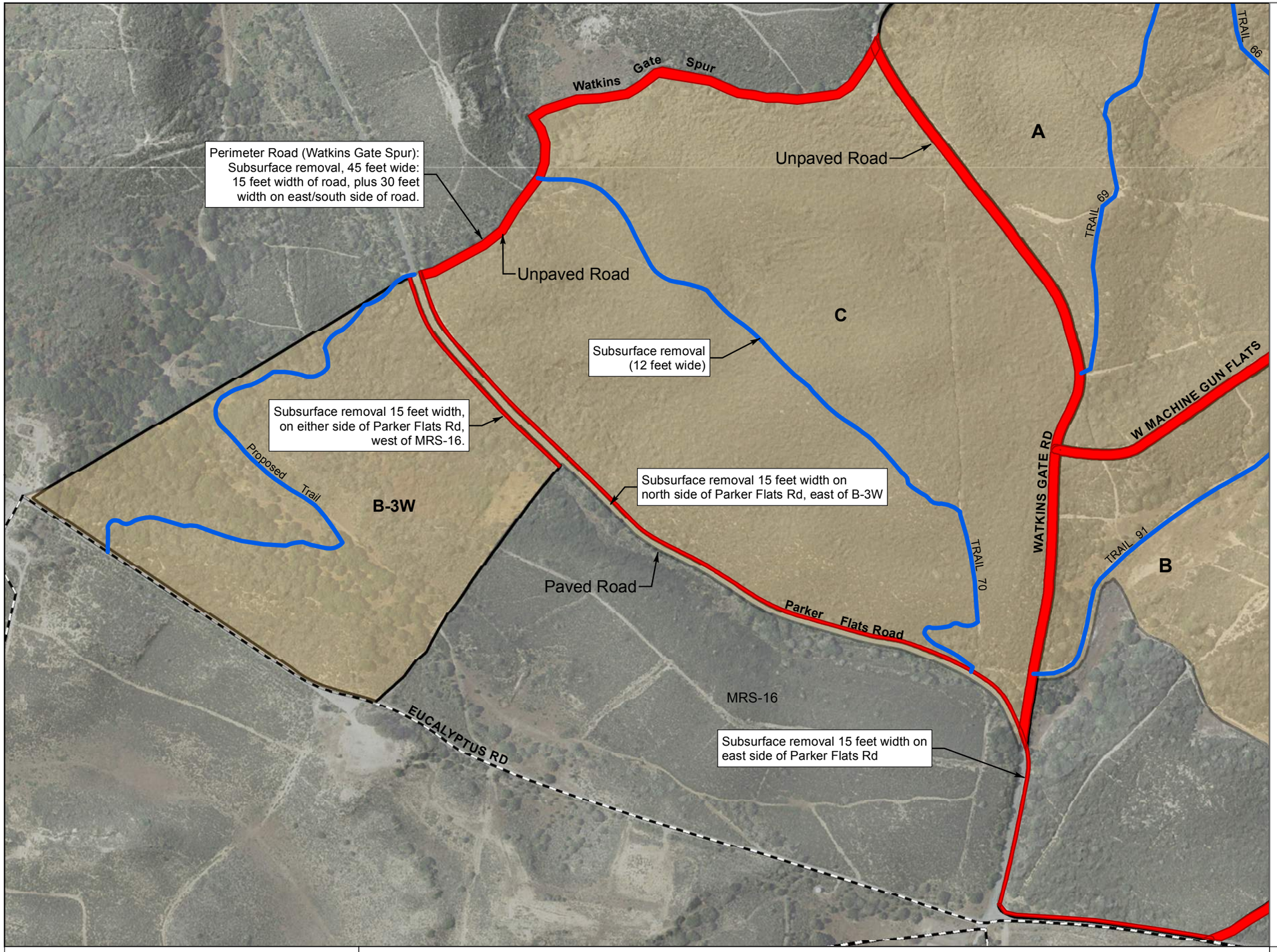

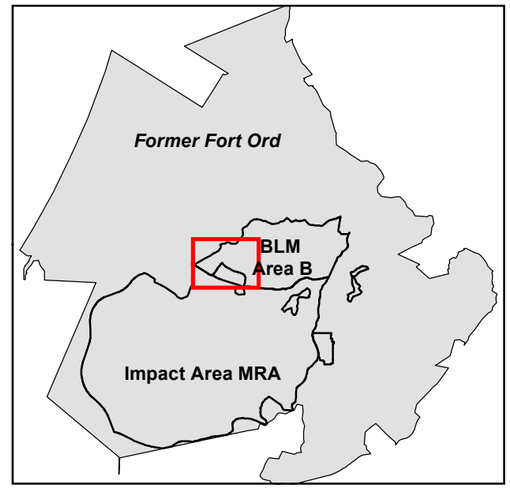

- Subsurface Removal Area - 45 Foot Width (Permanent Fuel Break)
- Subsurface Removal Areas, Existing and proposed trails - 12 Foot Width
- Remedial Work Area
- Vegetation Removal Area (Prescribed Burn or Cutting)
- Impact Area MRA

N

500 0 500 Feet

Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 10c

BLM Area B Subsurface MEC Removal Areas
(Remedial Work Area C)

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Hennekens Ranch Road:
Road is paved (15 feet wide).
Subsurface removal 15 feet width on road sides only.

Subsurface removal
(12 feet wide)

Subsurface removal 30 feet:
15 feet road width and 15 on the interior/south side of the road only.

HENNEKENS RANCH RD

TRAIL 16

TRAIL 23

TRAIL 57

TRAIL 15

ADDINGTON RD

TRAIL 56

E MACHINE GUN FLATS

TRAIL 62

TRAIL 61

BARLOY CANYON RD

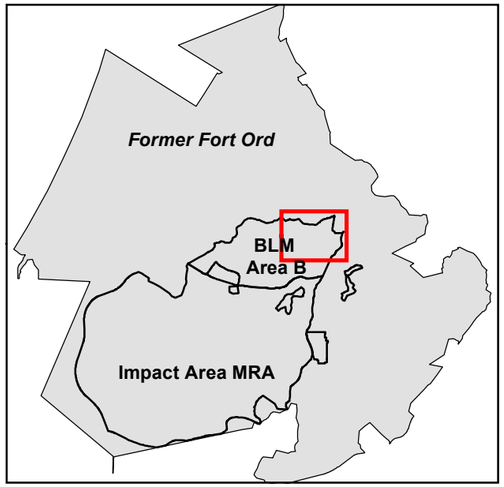
A

B

B-3E

B-2A

Hennek



Subsurface Removal Area - 45 Foot Width

Subsurface Removal Area - 30 Foot Width

Subsurface Removal Areas, Existing and proposed trails - 12 Foot Width

Remedial Work Area

Vegetation Removal Area (Prescribed Burn or Cutting)

N

500 0 500 Feet

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Site-Specific Work Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 10d

BLM Area B Subsurface MEC Removal Areas
(Remedial Work Areas B-3E and B-2A)

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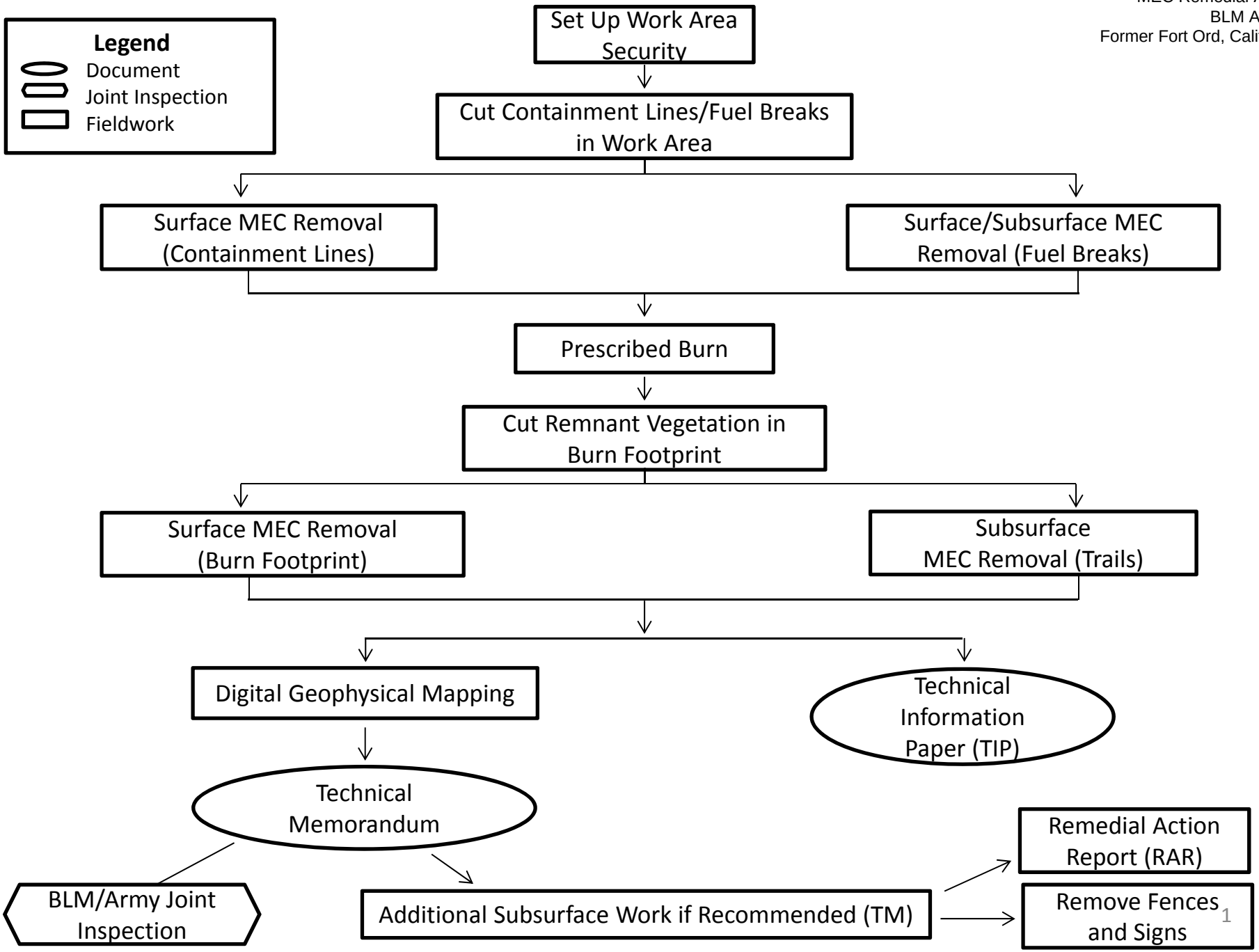
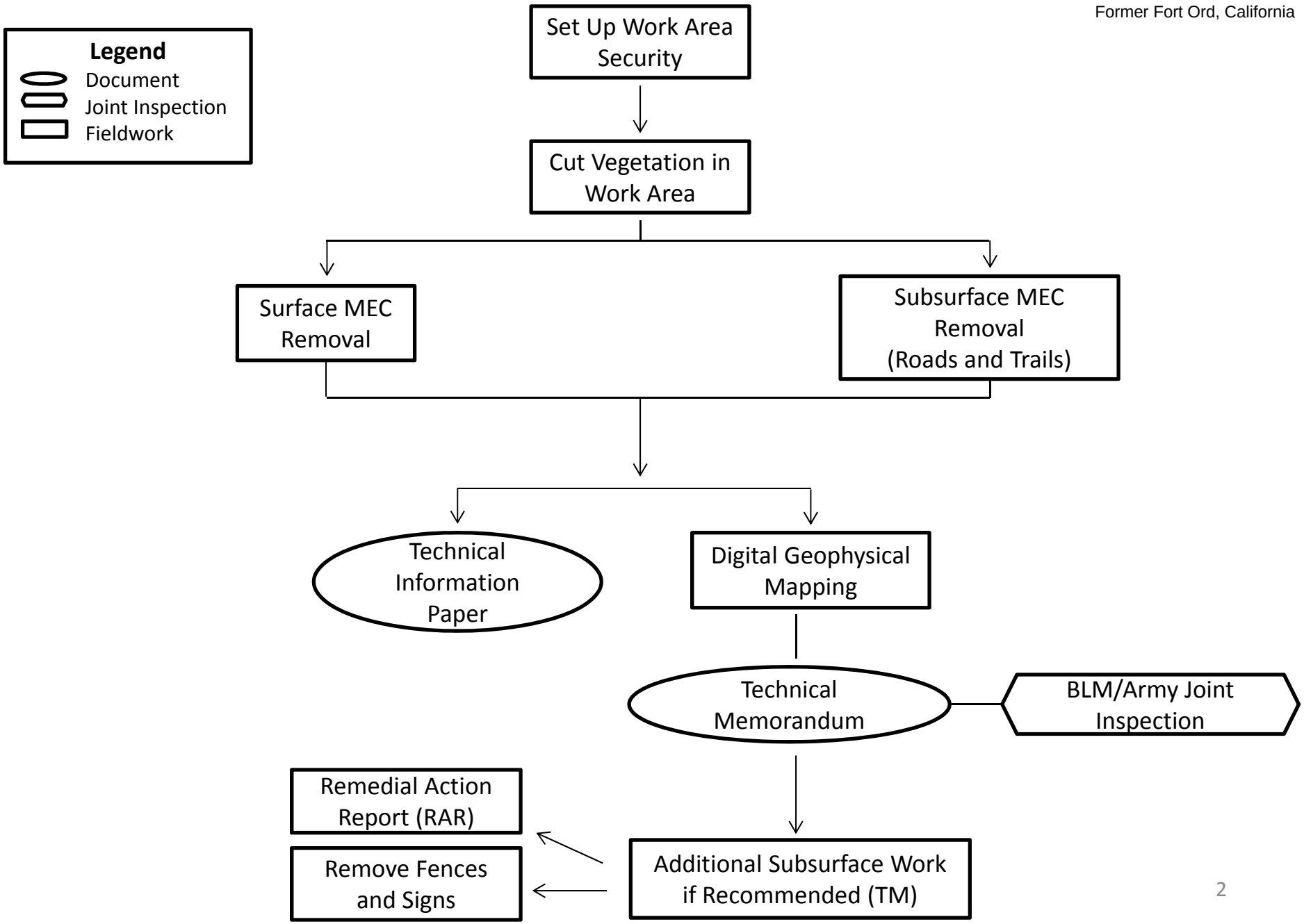
Flowcharts

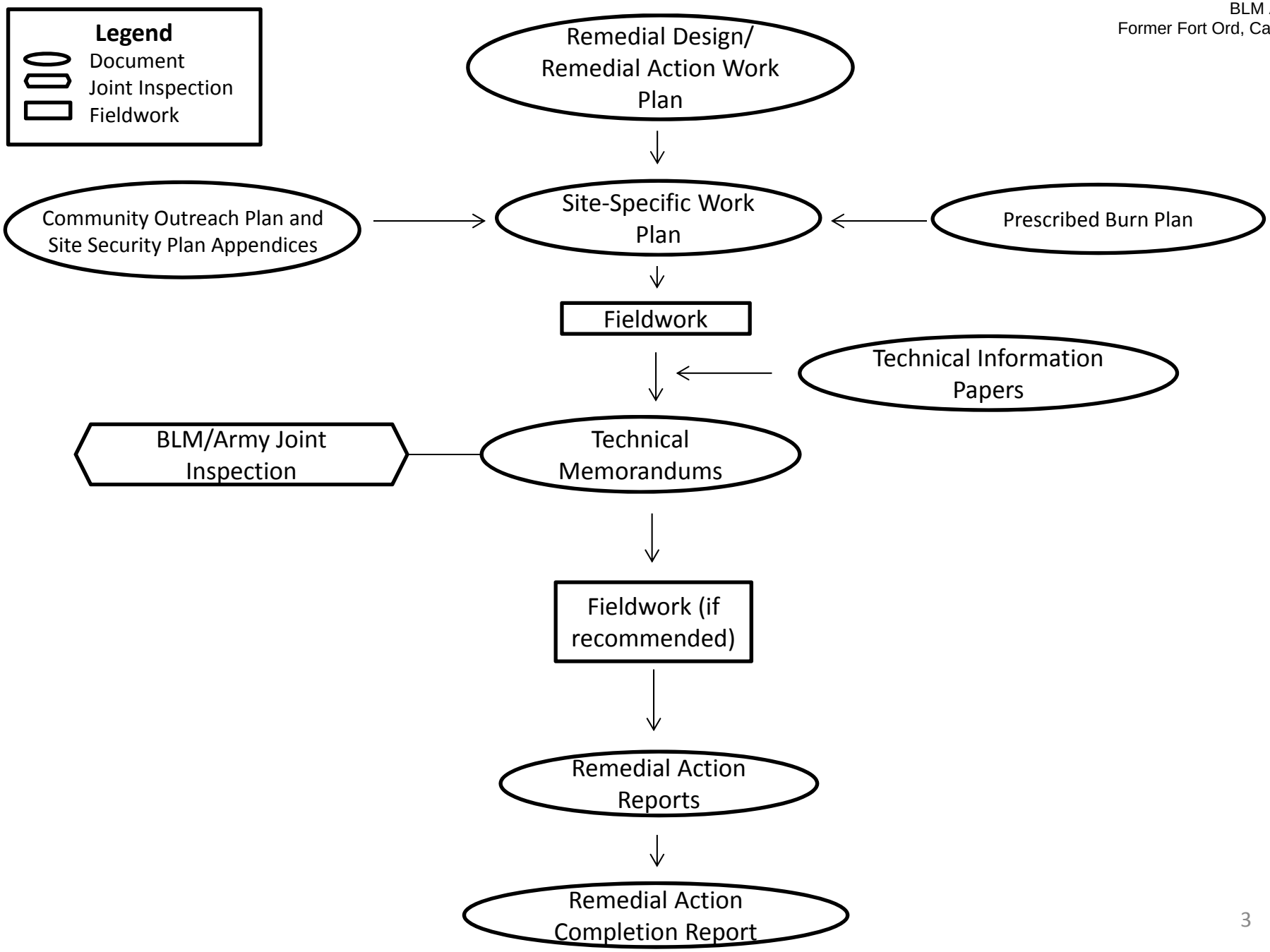
Burn Area Fieldwork



Vegetation Cut Only Fieldwork



BLM Area B and MRS-16 Documents



APPENDIX A
BLM Area B Community Outreach Plan

DRAFT

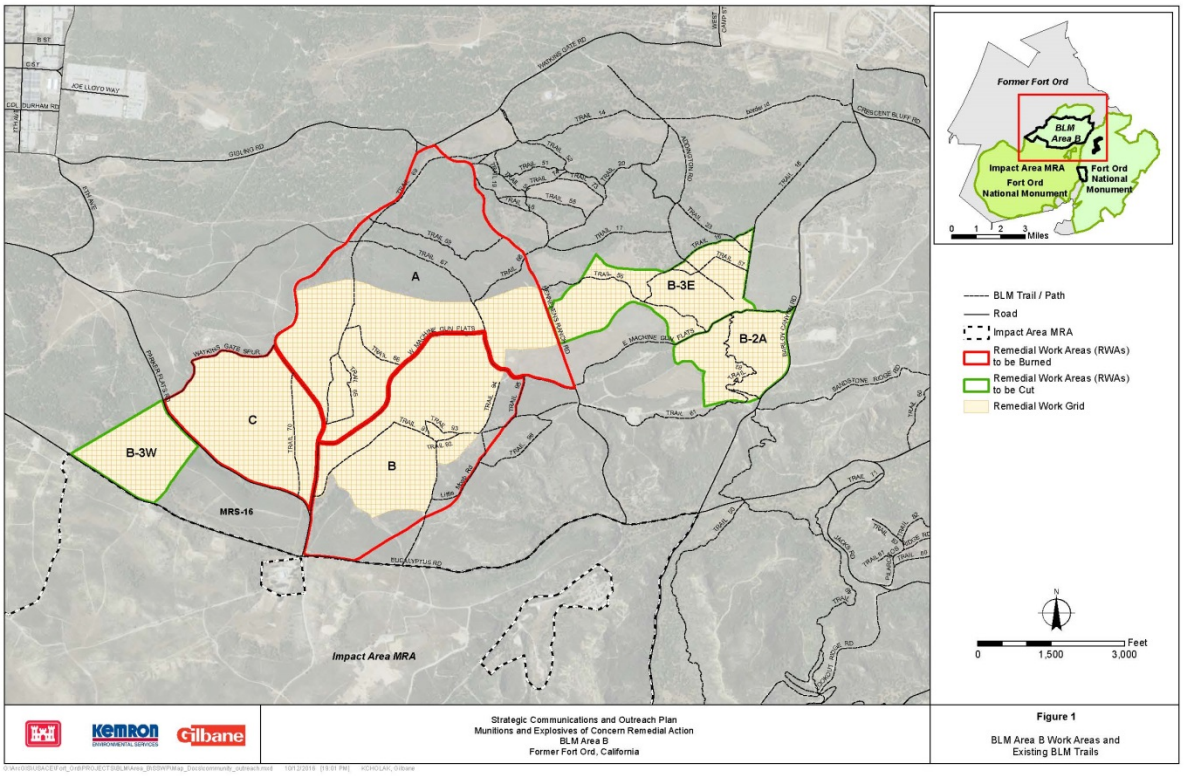
FORT ORD BLM AREA B MUNITIONS CLEANUP

Strategic Communications and Outreach Plan

1 STRATEGIC COMMUNICATIONS AND OUTREACH PLAN

1.1 Communications and Outreach Purpose and Objectives

The U.S. Army is conducting munitions cleanup in northern portions of the Fort Ord National Monument in an area the Army calls Bureau of Land Management (BLM) Area B at the former Fort Ord. Strategic communications and outreach will help facilitate public education about the planned munitions cleanup and provide timely notification of trail and area closures related to the cleanup activities being undertaken. The field activities that will necessitate trail and area closures include vegetation cutting to prepare for cleanup, prescribed burns, and removal of munitions and explosives of concern (MEC). Vegetation cutting and MEC removal activity will occur over a longer duration than prescribed burn events, which will typically last for a few days but involve closure of a larger area. Prescribed burns are anticipated to be used in a portion of the cleanup area. Building on past outreach efforts employing enhanced and timely communication tools and methods will help increase public understanding and support for this effort.



This communication and outreach plan describes the strategic communications and outreach associated with BLM Area B, and supplements the Community Relations Plan (Administrative Record number BW-2671A) that encompasses remediation activities at the former Fort Ord. This plan provides a communications "blueprint" for the actions that will help to educate and inform the public in a consistent and timely manner when cleanup activities and resulting trail closures take place. Notification and outreach activities related to the prescribed burns in this area will be outlined in the direct notification plan that will be provided in the burn plan.

Public lands at Fort Ord have been managed by the Bureau of Land Management (BLM) since 7200 acres were transferred from the Army to BLM in 1996. The property includes 86 miles of trails and is extensively used for hiking, bicycling and horseback riding by local residents and tourists. Many of these areas were formerly used by the Army for military training. The Army is conducting BLM Area B cleanup to ensure the public lands continue to be safe for public use. Measures will be taken throughout all cleanup activities to ensure public safety, and to minimize trail closure impacts that will occur while the cleanup activities take place.

1.2 Strategic Approach

The communication activities that are planned will entail a multi-pronged approach to meet the following objectives: educate the public about the purpose of the overall cleanup effort and schedule; provide advance notifications about cleanup activities, trail closures and other local area impacts; enhance public safety; and be responsive to local community questions, comments and concerns.

One of the most important community issues facing the cleanup effort is ensuring continued public access to the BLM lands and trails during remedial activities. Continuing to build upon and leverage well-established communication channels with partner agencies, local groups, organizations and interested community members is critical to our approach. Agencies and organizations such as the BLM, Fort Ord Reuse Authority (FORA), Fort Ord recreational users, schools, health and emergency services providers, local media, and interested parties already on project mailing and email lists are already engaged in the process.

Additional groups or clubs to consider engaging include FORT Friends, Monterey Off Road Cycling Association (MORCA), Marina Equestrian Center, Monterey Bay Area Hiking Group, and Presidio of Monterey Outdoor Recreation (ODR) Adventure Club. Continued involvement from existing and new groups will go a long way toward educating and informing additional members of the public and local community. Equally important are continued outreach at local activities and events such as the Sea Otter Classic, local Earth Day celebrations, National Public Lands Day, and Monterey County Fair; holding Community Involvement Mobile Workshops, community presentations, workshops and meetings; and conducting bus tour and trail walks. Continuing to engage local media and leveraging partner and group relationships to garner additional coverage such as public interest stories will build additional understanding of the program.

Enhanced use of electronic resources such as the program website and emails are also planned for this activity. Together these activities help to ensure an even broader cross section of the public become engaged and stay informed with timely, clear and consistent communications.

Ultimately, it is important for the public to regard the Army and the BLM as community partners who are engaged in cleanup activities as a key step in the process to complete the transfer of lands for enhanced public recreation and enjoyment.

1.3 Messaging

Below is an overview of the key messaging that will be used to educate and notify the public about the cleanup process and activities, dispel myths, and provide opportunities to learn more and/or get involved.

1.3.1 Consistent Messaging

Messaging about the purpose, goals and benefits of the cleanup program; notifications specific to cleanup activity and related trail closures; project contact information (website, email, and information line); and opportunities for public involvement (meetings, events, tours) will serve as consistent messages that can be applied to all informational and outreach materials (electronic and print), including the cleanup website, fact sheet, Frequently Asked Questions (FAQs), prescribed burn notices, emails, and press releases as appropriate.

1.3.2 Messaging to educate and provide information

Reinforcing key messages about the purpose, goals and benefits of the program will serve as a method of educating, building public support and cooperation before, during and after cleanup activities in BLM Area B. Variations of this messaging will be used in discussions with stakeholders (see Section 1.5), at public events, community presentations, workshops and meetings, and when conducting bus tours, trail walks or other public activities.

Messaging goals:

- Educate the public about the project and what they can expect (no surprises)
- Increase public familiarity with affected areas (through use of community names and local landmarks)
- Provide information and opportunities to get involved

1.3.2.1 To educate

Providing information about the cleanup process, advance notifications, the importance of public safety during cleanup activity and where to get more information will reinforce with the public that:

- The Army is committed to keep the community informed throughout the cleanup process
- The cleanup work is necessary to ensure that trails and surrounding areas are safe
- Cleanup work in this area will be ongoing for the next 3-4 years

- The cleanup effort is progressing on a schedule
- Public safety during cleanup activity is a priority
- Trail and road closures will be temporary when conducting cleanup activities and prescribed burns
- Affected trails and roads will be reopened for public use after cleanup takes place
- Advance notice will be given prior to trail and nearby area closures when possible
- The land being cleaned in BLM Area B will remain as habitat reserve in perpetuity after the cleanup is completed
- More information (website, email, information line) is available

1.3.2.2 Increase public familiarity of affected areas

Providing the public with regularly updated information about cleanup work, safety measures and related trail closures using local trail names and identifying locations will:

- Increase trail users familiarity with specific areas being impacted
- Increase awareness of affected trails prior to their closure
- Emphasize public safety and enforcement of trail closures

1.3.2.3 Provide information and opportunities to get involved

Information about opportunities for the public to participate in activities such as Community Involvement Mobile Workshops, bus tours, guest speaker events and other activities through the project website, fact sheet, email updates and information line, public meetings and events, notices, partner and agency newsletters, direct mailers, advertisements and other means will help get the word out to multiple audiences in a a timely manner.

1.4 Key Issues

Providing timely notifications, project updates and emphasizing trail safety will continue to be important in all communications about cleanup activities. Key issues to consider in communication efforts include:

- Providing consistent messaging across all channels of communication
- Limiting the amount of trail closure time whenever possible
- Providing timely project schedule updates and trail closure notifications
- Emphasizing public safety as the reason for trail closures
- Emphasizing the importance of sensitive species and the need to stay on trails to protect habitat
- Increasing public awareness of safety actions they should take during cleanup work
- Providing through routes for transit to other portions of the National Monument.

In addition, enhanced signage indicating trail closure areas, dates and safety issues prior to each burn or cleanup activity is recommended. More discussion of signage is included in Section 1.6, below.

1.4.1 Challenges

Throughout the cleanup effort, the Army has partnered with BLM in supporting safe public access to established trails and roads in the area for recreational uses. Ensuring continued safe usage during all cleanup activities is critical to continued public confidence and support of this work. Some of the challenges faced include:

- Providing regular and consistent updates and notifications about cleanup activities
- Public understanding of potential hazards during cleanup activities
- Preventing recreational users trying to access areas that are closed off due to cleanup activities
- People not reading and/or obeying warnings and trail closure signage
- Public not understanding the necessary duration of some trail closures
- Trail and recreational users not feeling they are an integral part of the cleanup process

1.5 Targeted Stakeholders and Other Audiences

The purpose of stakeholder outreach is to inform community members about the cleanup effort, provide timely information about cleanup activities and associated temporary trail/area closures, provide advance notification of prescribed burns, and identify community issues and concerns during the process. Ongoing relationships with partner agencies, local groups, organizations and other community members who are already involved in the process helps to continue spreading the word among these stakeholder groups. Continuing outreach at local activities and events, holding Community Involvement Mobile Workshops, community presentations, workshops and meetings, and conducting bus tour and trail walks reinforce messages and bring new people to the process.

It is important to continue these relationships and enlist local agency and group support in sharing project information with their own networks and constituencies while promoting public participation at public meetings and events. The Army will continue to confirm and augment the list of stakeholders, including adding names of organizations, groups or interested parties that are gathered through the website, email, information line and other sources.

Target audiences for cleanup effort communications and outreach are listed below. Communications with all audiences will include the request that they share information with their own networks and/or constituents.

- Army personnel, BLM, FORA, Monterey County staff
- CSUMB staff, faculty and students
- Monterey County residents and the residents of surrounding cities including Salinas, Marina, Del Rey Oaks, Seaside and Monterey (others as appropriate)
- FORT Friends, MORCA, Marina Equestrian Center
- Individuals, recreation groups and other trail users
- Recipients on mail and email lists
- Local media
- Engaging of additional groups or clubs such as the Monterey Bay Area Hiking Group, Presidio of Monterey, ODR Adventure Club and Velo Club Monterey

- Others who are interested in the cleanup process

1.6 Communication Tools and Methods

The following outreach tools will serve to notify Monterey County residents and recreational users about the overall BLM Area B cleanup effort. Notification and outreach activities related to the prescribed burns in this area will be outlined in the direct notification plan that will be provided in the burn plan.

- **Kickoff event** - The Army will hold a kickoff event timed to occur approximately 3-4 weeks prior to the start of cleanup work. The event will provide a project background and update, share upcoming cleanup activity and schedule information, provide information about anticipated trail and road closures, show how people can stay informed, and answer questions.

- **Project fact sheets** – The BLM Area B Fact Sheet provides a background of the cleanup effort and next steps. The fact sheet will be updated as the cleanup activity progresses. The fact sheet will be distributed at public meetings and community events, and made available to interested parties electronically through the program website.

- **Project FAQ –** An FAQ specific to BLM Area B cleanup will be developed to include road and trail information as well as the purpose, goals and benefits of the cleanup program and project contact information. The Fort Ord Prescribed Burns FAQ will provide answers to many of the questions raised by the public as a part of the prescribed burn program.

- **Project web page** – The project website at http://fortordcleanup.com/programs/blm-area-b/ is an important way for community members to obtain timely information about cleanup progress, prescribed burn notifications, status updates, anticipated trail closures, related safety measures, and how to obtain more information. Notifications and information on the website about the status of work activities will be posted and regularly updated. The web URL will be shared with partner agencies, local groups, organizations, interested community members, and included in program collateral, at public meetings and events. Partner websites and newsletters will be used to share this information with broader audiences. Circlepoint will develop content for the web page with support and copy approval from USACE. The information shared on this web page will include:

    - Brief background and purpose of the cleanup activity and prescribed burns
    - Map showing affected cleanup/closure area(s)
    - What to expect and related safety measures in place for cleanup activities
    - Links to relevant information and FAQs
    - A location for the community to provide comments and feedback

- **Notices and Advertisements** – Additional methods to notify community members about the upcoming cleanup activities and related trail/area closures include:

    - Press releases to local media as necessary

  - Preparation and distribution of flyers and newspaper notifications (where appropriate)
  - Continued use of a direct mailer and cleanup project mailing list
  - Announcements provided to agency partners, local organizations and interest groups that can be posted in their newsletters and distributed to their email lists

- **Media** –The Army will continue to write and distribute press releases and pursue traditional media coverage with local news channels, newspapers and radio as necessary. In addition leveraging partner and group relationships to garner additional coverage through public interest stories or media tours should be considered.

- **Trail Closure Notifications and Signage** – Trails and roads that are closed for cleanup activities will be marked with signs and notices. Placement of signs will change as the cleanup progresses. The signs will also refer community members to additional information at the website http://fortordcleanup.com/programs/blm-area-b/.

- **Public Meetings and Events** – Information and updates about cleanup activities will continue to be shared at public meetings and events.

- **Local Recreational and Supply Outlets** - Additional outreach will be made to local bicycle and/or hiking/recreational outlets such as REI, Bay Bikes, Outdoor World Sporting Goods, and others.

- **Update Notification Lists** – Program information, notifications and updates about cleanup activities will continue to be regularly updated.

- **Translation** – The Army will continue to provide translation services and notifications to multicultural audiences, as needed. Translation services are available upon request for program information (fact sheet, FAQ, trail signage, etc.), the website, and the information line.

1.7 Performance Measures for Outreach Effort

The Army will evaluate the outreach measures as the cleanup progresses. Circlepoint will use the following methods to determine if the objectives of the strategic communications plan are being met and to recommend appropriate adjustments to outreach actions:

  - Website analytics such as web page usage
  - Track the timing and number of email messages sent out to ensure outreach is consistent and ongoing.
  - Tracking continued growth of the project contacts and email lists
  - Track the number of meetings, events, presentations, tours and similar activities held, attendance numbers, types of materials distributed and oral and written feedback received

Summary

Strategic communications and outreach will help facilitate public education about the planned munitions cleanup and provide timely notification of trail and area closures related to the cleanup activities being undertaken.

The Army is committed to educating, sharing information and involving the community during Fort Ord BLM Area B munitions cleanup. So that the cleanup activities can be completed in a safe and timely fashion, this outreach plan will help facilitate communication with the public during the cleanup activities. This outreach plan will be refined over time as needed to reflect the progress of the cleanup work and stakeholder feedback. It is anticipated the outreach actions will be adjusted over time, based on feedback and evaluations, in order to better inform, educate and engage the local community.

APPENDIX B
BLM Area B Site Security Plan

DRAFT
SITE SECURITY PLAN
MUNITIONS AND EXPLOSIVES OF CONCERN
REMEDIAL ACTION BLM AREA B
Former Fort Ord, California

May 2017
Version: Draft

Prepared for

United States Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814

Contract No. W912DY-10-D-0027 Task Order CM01

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DRAFT
SITE SECURITY PLAN
MUNITIONS AND EXPLOSIVES OF CONCERN
REMEDIAL ACTION BLM AREA B
Former Fort Ord, California

May 2017
Draft

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Acronyms and Abbreviations

Acronym	Definition
Army	United States Department of the Army
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
DDESB	Department of Defense Explosives Safety Board
ESS	Explosives Safety Submission
EZ	Exclusion Zone
ft.	feet
KEMRON	KEMRON Environmental Services, Inc.
MEC	Munitions and Explosives of Concern
MRS	Munitions Response Site
MSD	Minimum Separation Distance
OESS	Ordnance and Explosives Safety Specialist
POMPD	Presidio of Monterey Police Department
RA	Remedial Action
RWA	Remedial Work Area
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SSWP	Site-Specific Work Plan
SUXOS	Senior Unexploded Ordnance Supervisor
TIP	Technical Information Paper
USACE	United States Army Corps of Engineers
UXOSO	Unexploded Ordnance Safety Officer

SECTION 1 INTRODUCTION

This Site Security Plan outlines the procedures for site security to perform safe operations during the remedial action (RA) selected for sites called "Bureau of Land Management (BLM) Area B at the former Fort Ord, California. The BLM Area B and Munitions Response Site (MRS)-16 remedy is documented in the *Final Record of Decision* (ROD), *Track 2 BLM Area B and MRS-16, Former Fort Ord, California* (United States Department of the Army [Army], 2017). For a site description of BLM Area B and MRS-16, see Section 1 of the *Draft Site-Specific Work Plan (SSWP) Munitions and Explosives of Concern (MEC) Remedial Action BLM Area B Former Fort Ord, California* (KEMRON Environmental Services [KEMRON], 2017).

The ROD addresses MEC that may be present in the BLM Area B and MRS-16 at the former Fort Ord (Figure 1). The *Final, Revision 2. Track 2 Remedial Investigation/Feasibility Study* (RI/FS) *BLM Area B and MRS-16, Former Fort Ord, California* (Gilbane, 2015) subdivided BLM Area B into eight sub-areas to evaluate the presence of MEC (Figure 2). This Site Security Plan supports the selected remedy for BLM Area B sub-areas B-2A and B-3 (792 acres) which is technology-aided surface MEC remediation, subsurface MEC remediation in selected areas, and land use controls.

The two remedial sub-areas, B-2A and B-3 (Figure 2), addressed in this Site Security Plan are further divided into 7 remedial work areas (RWAs) (Figure 3). From herein the terminology of RWAs will be referenced to describe the site security plan and are as follows:

- Work Area A (Burn RWA)
- Work Area A-N (Cut RWA)
- Work Area B (Burn RWA)
- Work Area B-2A (Cut RWA)
- Work Area B-3E (Cut RWA)
- Work Area B-3W (Cut RWA)
- Work Area C (Burn RWA)

The Army will temporarily close access to roads and trails when it is necessary to conduct fieldwork. The plan intends to avoid prolonged closures and reopen the roads and trails as soon as possible. Information updates in regards to temporary trail and road restrictions for RWAs will be posted on Fort Ord's website, www.FortOrdCleanup.com/blm-area-b/.

SECTION 2 SECURITY PLAN OBJECTIVE

The BLM Area B Site Security Plan's objective is to establish and maintain the public safety exclusion zone (EZ) when MEC operations are occurring. An EZ is defined as the minimum separation distance (MSD) (See Section 4.0) around the RWA boundary that only essential personnel may enter. The essential personnel for this project are identified by the KEMRON Unexploded Ordnance Safety Officer (UXOSO). The MEC operations will include vegetation clearance, surface MEC removal, and subsurface MEC removal (See SSWP, Section 2.0). The KEMRON Senior Unexploded Ordnance Supervisor (SUXOS), KEMRON UXOSO and United States Army Corps of Engineers (USACE) Ordnance and Explosives Safety Specialist (OESS) will review the EZs daily to determine if changes are required.

SECTION 3 PROJECT ORGANIZATION

3.1 U.S. Army Fort Ord Base Realignment and Closure

The Army is the lead agency for conducting the RA in BLM Area B RWAs. The Fort Ord Base Realignment and Closure (BRAC) office is responsible for informing the local community and regulatory agencies about the RA. The RA and associated site security actions will encompass federal (Army and BLM) property as well as non-federal properties. The Fort Ord BRAC office will coordinate the site security activities with the Presidio of Monterey Police Department (POMPD) and BLM as well as adjacent property owners and responsible security and law enforcement agencies.

3.2 U.S. Army Corps of Engineers

The USACE supports the Fort Ord BRAC office in the implementation of the RA, including the associated site security measures. The USACE OESS has oversight authority for explosives safety during MEC operation. The Explosives Safety Submission (ESS) establishes the munitions response safety criteria including the public safety EZ for MEC operations.

3.3 Presidio of Monterey Police Department

The POMPD is the law enforcement authority on former Fort Ord Army property. POMPD will provide support to the MEC remediation activities.

3.4 Bureau of Land Management

Portions of the area that will be affected by this site security plan are under BLM management as part of the Fort Ord National Monument. BLM is the law enforcement authority on BLM lands

at the former Fort Ord and enforces its public access management measures (e.g., non-motorized access on designated roads and trails, day use only, etc.)

3.5 KEMRON Environmental Services

KEMRON is responsible for implementation of the RA in the BLM Area B RWAs in accordance with the SSWP. KEMRON is responsible for developing and implementing this site security plan to ensure worker and public safety during the RA in BLM Area B RWAs.

SECTION 4 IMPLEMENTATION

The BLM Area B Site Security Plan will use signs, fencing, and private security to restrict public access during the MEC operations. The Army will also incorporate outreach locations and a trail status webpage to support site security to inform the recreational users about the cleanup program. There will be temporary fencing placed around each RWA boundary when MEC operations are occurring. There will be temporary barriers placed across all trails 450 feet (ft.) from the RWA boundary. Road barricades will be placed across all roads 450 ft. from the RWA boundary. Public access will be restricted in a 450 ft. zone around the RWA that has ongoing operations. RA could occur in one or more RWAs at any time (Figures 5a-5f). Three types of signs (See Attachment 1) will be used for the BLM Area B RWA cleanup efforts: danger, warning, and notice. Danger signs will be placed on the RWA boundary fence. Warning signs will be placed on the trail and road barriers. Notice signs will be placed on trails and roads in advance of trail and road closure points. The notice signs will warn people that they are approaching a restricted area and that there will be a dead-end ahead. Private security guards will be patrolling the BLM Area B lands near active operations to enhance the general public's safety.

As shown on the BLM Area B and MRS-16 fieldwork flowcharts (See BLM Area B SSWP Flowcharts), site security will be implemented before MEC operations begin.

The EZ for all MEC operations will default to the most conservative MSD (in this case 450 ft.) to ensure the public's safety due to varying activities in RWAs. The 450 ft. MSD is the mastication safe operation distance. The MEC MSD is the hazardous fragment distance of the munition with the greatest fragmentation distance found in BLM Area B based on historical range and sampling data. The MEC MSD may be adjusted based on the MEC types actually encountered during the RA. KEMRON will conduct the work utilizing engineering controls during MEC operations and detonation operations as needed. During the course of the RA, if MEC with a greater fragmentation distance is encountered, the MSD will be adjusted in accordance with the SSWP (Section 2.6).

4.1 Cut RWAs

BLM Area B RWAs A-N, B-2A, B-3E and B-3W are scheduled for vegetation removal by manual and mechanical cutting. The cut RWAs will follow the general implementation outlined in the BLM Area B SSWP Flowcharts. At times, MEC operations may occur in adjacent RWAs and security measures will be adjusted as needed to reflect the required EZ.

4.2 Burn RWAs

BLM Area B RWAs A, B, and C are scheduled for vegetation removal by prescribed burning. During site preparation, such as fuel breaks and containment line preparation activities, the EZ will be established and maintained at 450 ft. throughout the operations. The burn RWA fence will be removed once the primary containment is prepared. Site security for prescribed burn events will be implemented as specified in a prescribed burn-specific security plan that will be included in the prescribed burn plan. Immediately after prescribed burning, a RWA fence will be installed and EZ will be established (thereafter, the process will be the same as the cut RWAs).

4.3 MEC Transportation

It may be required to transport items for demolition across roads for consolidation and demolition. During those times of transport, temporary road closures will occur. Access points to the transport route traveled will be blocked to prevent public entry. Road guards will be positioned to ensure that the general public does not enter the transportation route and required EZ during transport. Once transportation is complete, the temporary closures will end.

4.4 Access Corridor Roads

Access corridor roads will be established to allow the public to transit the National Monument to the greatest extent possible after fieldwork hours. When there is an area with ongoing work and the work area EZ extends into a nearby access corridor road, that access corridor road may be closed during work hours. When this becomes necessary, appropriate barrier (traffic barricade, chain linked fence, snow fence, etc.) will be chosen to secure the access corridor, and road guards will be stationed at the intersection of the EZ and access corridor to ensure user safety.

The following roads will be established access corridor roads:

- Addington Road
- Barloy Canyon Road
- E Machine Gun Flats
- Eucalyptus Road

- Gigling Road
- Hennekens Ranch Road
- Parker Flats Road
- W Machine Gun Flats
- Watkins Gate Road
- Watkins Gate Spur

SECTION 5 FENCING

All temporary RWA fencing will be inspected daily by the UXOSO or personnel designated by the UXOSO. All fence damage will be noted in the security log and evaluated weekly. Appropriate adjustments will be made as needed and announced during the morning safety meeting. All changes initiated will also be recorded in the security log. If field personnel observe unauthorized entry while operations are underway, work will be stopped and their team leader will be informed. The team leader will notify the SUXOS and UXOSO. If a trend occurs at a specific entry point, the fence barrier, or barricade may be enhanced to increase security. Any fencing that appears tampered with will be reported to the UXOSO and documented accordingly (See Section 7.2). Maintenance needed for fencing will be addressed daily.

5.1 RWA

A temporary fence will be installed to create a physical barrier around the entire RWA when MEC operations are underway. This will define the RWA boundary and discourage recreational users from unknowingly walking into the RWA.

SECTION 6 SIGNS

Three types of signs (See Attachment 1) will be used for the BLM Area B RWA MEC remedial operations: danger, warning, and notice.

Type	Size	Location
Notice Sign	18” X 12”	Frequently used areas in advance of warning signs
Warning Sign Trails	18“ X 15”	On trail barriers (at a minimum 450 ft. from the RWA boundary)
Warning Sign Roads	29” X 24”	On road barrricades (at a minimum of 450 ft. from the RWA boundary)
Danger Sign	12” X 9”	Every 300 ft. on RWA temporary fence in nonvisible locations
Danger Sign	24” X 18”	Every 300 ft. on RWA temporary fence in visible locations

6.1 Notice Sign

Notice signs will be placed in frequently used areas and in advance of trail barriers or road barricades. The signs will caution recreational users to turn around or find an alternate route before reaching a dead-end. See Attachment 1 to view the notice sign template.

6.2 Warning Signs

Warning signs will be attached to all trail barriers and road barricades to restrict access into EZ. See Attachment 1 to view the warning sign template.

6.2.1 Trail Barriers

Appropriate temporary trail barriers will be placed across trails at the intersection of trails and the EZ (minimum of 450 ft. extended around the RWA). The trail barrier will consist of temporary fencing placed completely across the trail to establish a physical boundary. The temporary fence installed across the trails will stay in place for the entirety of MEC operations pertaining to the RWA.

6.2.2 Road Barricade

Appropriate portable road barricades will be placed across roads at the intersection of roads and the EZ (minimum of 450 ft. extended around the RWA). They will provide temporary restrictions on administrative roads. The portable barricade will be removed at the completion of the workday for access during non-work hours. The access corridor roads that may be affected in BLM Area B are Addington Road, Barloy Canyon Road, E Machine Gun Flats, Eucalyptus Road, Gigling Road, Hennekens Ranch Road, Parker Flats Road, W Machine Gun Flats, Watkins

Gate Road and Watkins Gate Spur. These roads will be priority to remain open as often as possible.

6.3 Danger Signs

Danger signs will be attached to the temporary RWA fence every 300 ft. See Figures 5b-5f to view the locations of the RWA fences.

SECTION 7 PRIVATE SECURITY

Two security guards will conduct patrols during MEC operations in BLM Area B. The security guards' daily duties will include, but are not limited to, the following:

- Attend the UXOSO's morning safety tailgate meeting daily. The security guards will receive directions as needed and perform the security log book turnover.
- Observe assigned areas for unauthorized activity.
- Be present at the most used entry points.
- Inspect fences.
- Keep an accurate and detailed written log (See Attachment 2).
- Identify all unauthorized vehicles observed on controlled roadways or in restricted work areas. Record or photograph vehicle make and model (See Attachment 2). In addition, report the vehicle information to the appropriate law enforcement.
- Respond to unauthorized persons as directed in Section 7.1.

7.1 Response to Unauthorized Persons

If possible, the security guards shall follow the following protocol when intercepting unauthorized persons:

- First, the security guard shall inform the unauthorized persons that they must turn around due to active MEC operations. Security guard will radio the UXOSO to inform him of the location of unauthorized persons. If required, the UXOSO will instruct operations to shut down.
- Second, ask the unauthorized persons how and where they obtained entry into the work area. The security guard will also inquire if anyone else is in the area. (This shall be noted in the logbook.)

- Third, call the proper law enforcement authority and request a citation be issued if the unauthorized person refuses to leave the area.

- Lastly, ensure that the persons have exited the EZ. The security guard will radio the UXOSO to inform him that the EZ has been secured.

All interceptions of unauthorized persons shall be documented in the written log (See Attachment 2). The security guards will include the location of the interception and the point of entry.

7.2 Private Security Equipment

The required equipment for the security guard is shown in the list below:

- Written Log: A written log will be maintained by each security guard on duty. This includes the documentation of unauthorized personnel activities, mischief damage, and unauthorized vehicles (See Attachment 2). That log will be signed by the security guard at the end of each shift. All logs will be collected and filed by the UXOSO. The log book will be distributed to the security guard in the morning safety tailgate from the UXOSO.

- Keys: Provided for security personnel as necessary for the purpose of security operations, emergency access, and exit of controlled roadways. Keys will be tracked and signed for at the beginning of the project and will be returned at the end of the project. The UXOSO will issue and maintain keys.

- Map: The most recently updated map will be provided for patrol guidance to specify EZs, closed trails, and controlled roadways.

- Radio: A two-way radio will be provided to each patrol unit.

- Cell phone: Every security guard will have a cell phone to be contacted, to contact others, and for photograph capability.

- Vehicle: Security guards will drive when conducting patrols whenever possible. Areas not feasible to drive will be patrolled by foot.

SECTION 8 LAW ENFORCEMENT

The POMPD, BLM law enforcement authority will enforce restricted access areas during MEC remedial operations. On Army land the authority is POMPD. On BLM land the authority is the BLM law enforcement. The Monterey County Sheriff will respond to BLM cleanup work on

non-federal lands. The law enforcement will respond to violations of EZ restricted access under 43 C.F.R.§ 8364.1 (d), CA PC 602 (f), (k), (l), (m), (n), (o), (p)., and Title 18, U.S.C., Section 1382. Signs to enforce restricted areas are defined in Section 6.0 and displayed in Attachment 1 of this security plan.

SECTION 9 EVALUATION OF SECURITY EFFORT

The security plan for the BLM Area B RWAs for the MEC operations will require a continuous evaluation to ensure effectiveness. Each RWA will be evaluated and may be treated differently due to several factors such as areas most frequently used. Site security levels at each RWA will be monitored to ensure the EZ is being maintained. All incidents will be logged in the security log (See Written Log in Section 7.2). The UXOSO is responsible for evaluating the security measures daily to identify appropriate adjustments. Changes to the security measures will be announced at the morning UXOSO safety tailgate meeting with all field personnel. The UXOSO will note the change in the written log the day the change is implemented.

SECTION 10 OPTIONS TO ADJUST SECURITY EFFORT

- To ensure effectiveness, adjustments to the security effort will be made based on the continuous evaluation. Options for incremental changes include the following:
- Increase quantity of “Notice”, “Warning” or “Danger” signs.
- Alter the size of the signs.
- Vary the sign colors.
- Change sign wordage.
- Enhance temporary fence around RWA boundary.
- Enhance portable barricade at EZ boundaries.
- Enhance the type of trail barrier.
- Alter security guard patrolling method.
- Increase quantity of security guards.

SECTION 11 OUTREACH INFORMATION

Parking areas and trail entrances provide an opportunity to enhance recreational users’ awareness on current remedial operations. Outreach locations support site security as another mechanism to

inform recreational users about the cleanup project and about ongoing fieldwork in the nearby area. The following list is possible locations (See Figure 4) where the cleanup information can be posted:

Location #	Location Name	Land Owner	Parcel #	Type of Outreach
1	Jerry Smith Corridor	County	L20.2.1	Single sided bulletin
2	Gigling Parking Lot	Monterey Salinas Transit	L2.4.2	Potential future single sided bulletin
3	Gigling Rd and 8th Ave Extension	FORA	E19a.1	Single sided bulletin
4	Gigling Rd and Watkins Gate Rd	FORA	E19a.4	Single sided bulletin
5	Watkins Gate Rd and Trail 52	BLM	F1.2	Single sided bulletin
6	Addington Rd and Watkins Gate Rd	County	L20.2.1	Single sided bulletin
7	East Garrison at Watkins Gate Rd	County	L20.2.2	Single sided bulletin
8	Parker Flats Rd and 8th Ave Extension	FORA	F1.3	Single sided bulletin
9	Creekside Terrace Parking	BLM	F1.1.1	Existing three sided bulletin
10	Badger Hills Parking	BLM	F1.1.3	Existing three sided bulletin
11	SGT MacDonald Trail	FORA	S1.3.2	Single sided bulletin

SECTION 12 AFFECTED TRAILS

The trails and roads that will be temporarily closed during the BLM Area B MEC remedial operations are listed below in correlation to the RWA. The names listed in parenthesis under the trail column are common trail names used by the public. The trail status will be updated on the

BLM Area B website, www.FortOrdCleanup.com/blm-area-b/, under the trail status link found under the community info. Updates to the webpage will be completed in a timely manner. See Figures 5a through 5f to review the RWAs and associated trails within BLM Area B.

Trail	RWA	Trail/Road	RWA
Trail 14	A-N	Trail 73	B-3E
Trail 15	B-2A, B-3E	Trail 91	A, B, C
Trail 16	A, B-2A, B-3E	Trail 92	B
Trail 17	A, B-3E	Trail 93	B
Trail 18	A-N, A	Trail 94	A
Trail 20	A	Trail 95	A, B
Trail 23	B-2A	Trail 96	B
Trail 51	A-N	Trail 101 Loop	B, C
Trail 54	A-N	Trail 102	B-2A, B-3E
Trail 55	B-3E	Little MOAB	A, B
Trail 56	A, B-3E	***Addington Rd***	B-3E
Trail 57	B-3E	***Barloy Canyon Rd***	B-2A
Trail 59 (Blair Witch)	A, A-N	***E Machine Gun Flats***	B-2A, B-3E
Trail 61 (Bermese)	A, B, B-2A, B-3E	***Eucalyptus Rd***	B, B-3W
Trail 62 (Chain Gang)	B-2A, B-3E	***Gigling Rd***	A-N
Trail 65	A, B, C	***Hennekens Ranch Rd***	A-N, A, B-3E
Trail 66	A, B	***Parker Flats Rd***	B, B-3W, C
Trail 67	A	***W Machine Gun Flats***	A, B, C
Trail 68	A	***Watkins Gate Rd***	A, A-N, B, C
Trail 69	A, C	***Watkins Gate Spur***	A, B-3W, C
Trail 70	B, C		

Note: Access corridor roads are in purple/bold/italicized and will allow for public transit within the National Monument to the greatest extent possible after fieldwork hours.

SECTION 13 REFERENCES

Department of Defense Explosive Safety Board (DDESB), 2009, *Technical Paper 16, Methodologies for Calculating Primary Fragment Characteristics, Revision 3*. August.

Gilbane, 2015. *Final, Revision 2, Track 2 Munitions Response Remedial Investigation/Feasibility Study, BLM Area B and MRS-16, Former Fort Ord, California*. May. (AR# OE-0802D)

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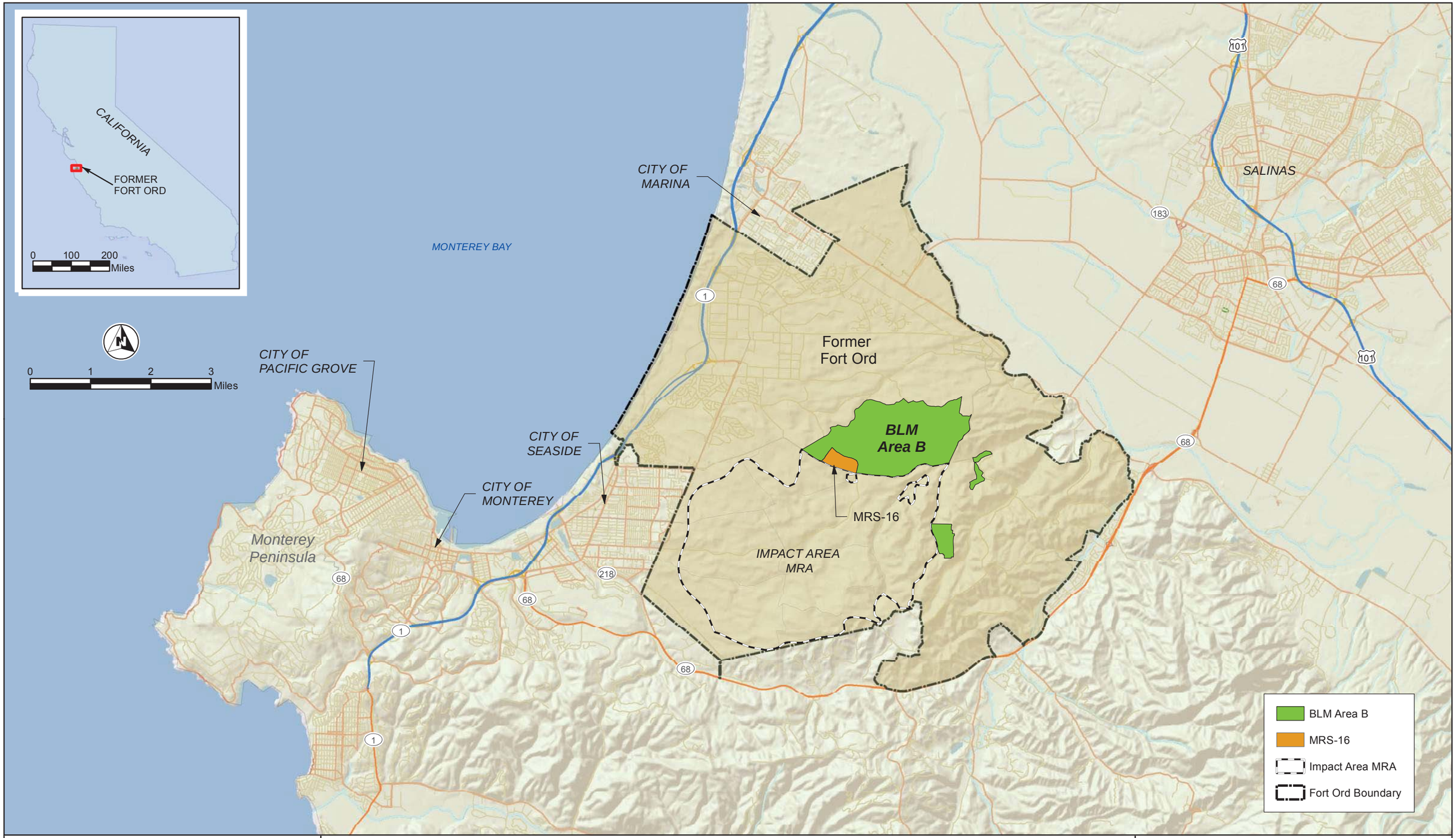
Figures



Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 1

Regional Location Map
BLM Area B

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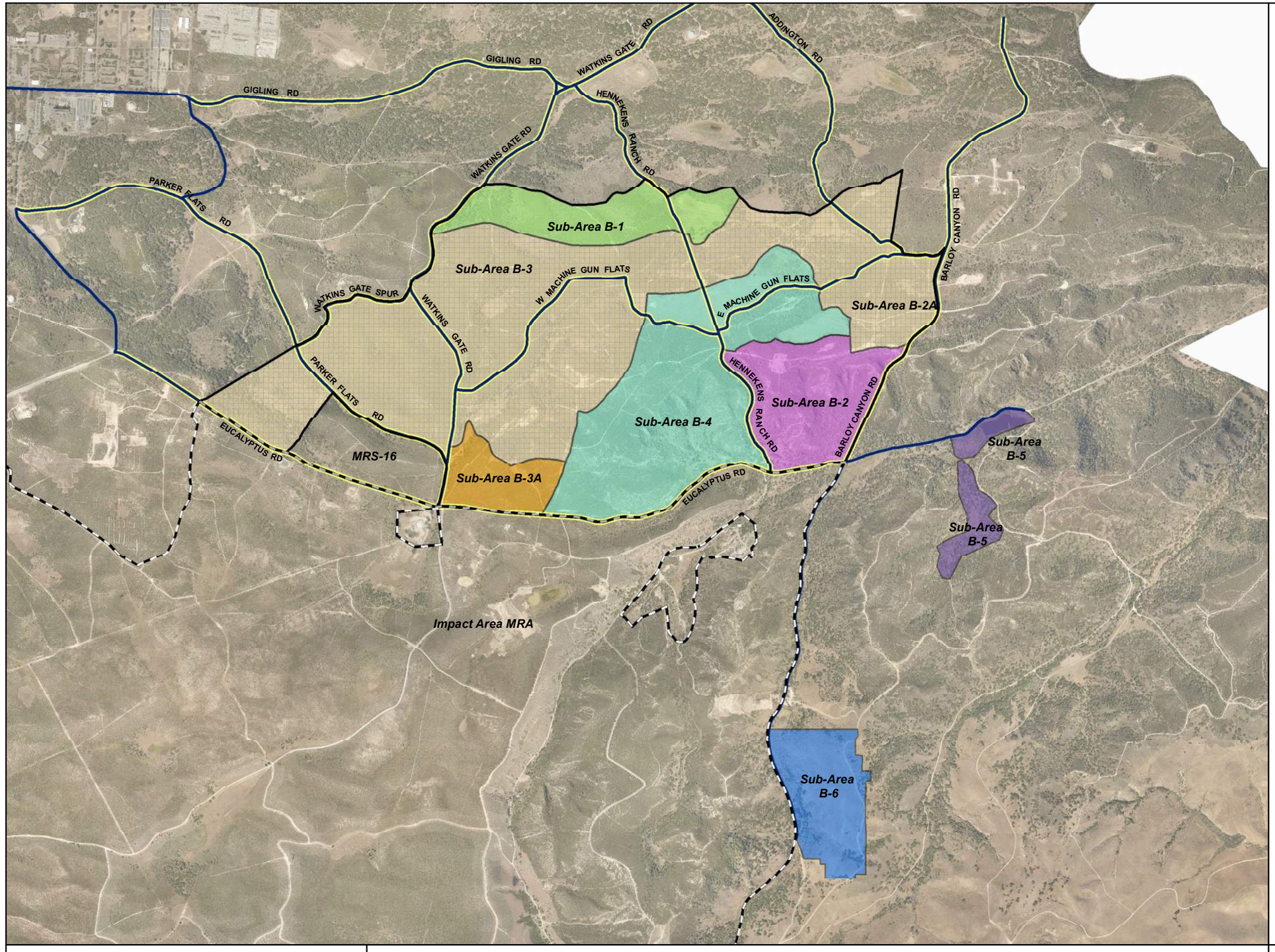

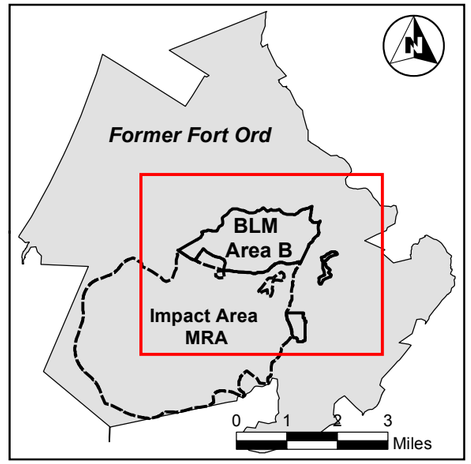

Remedial Work Grid (Sub-Areas B-2A and B-3)

BLM Area B Sub-Areas

- B-1
- B-2
- B-2A/B-3
- B-3A
- B-4
- B-5
- B-6

Impact Area

BLM Area B

Road

Access Corridor Road

2,000 1,000 0 2,000 Feet

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 2

BLM Area B RI/FS Sub-Areas

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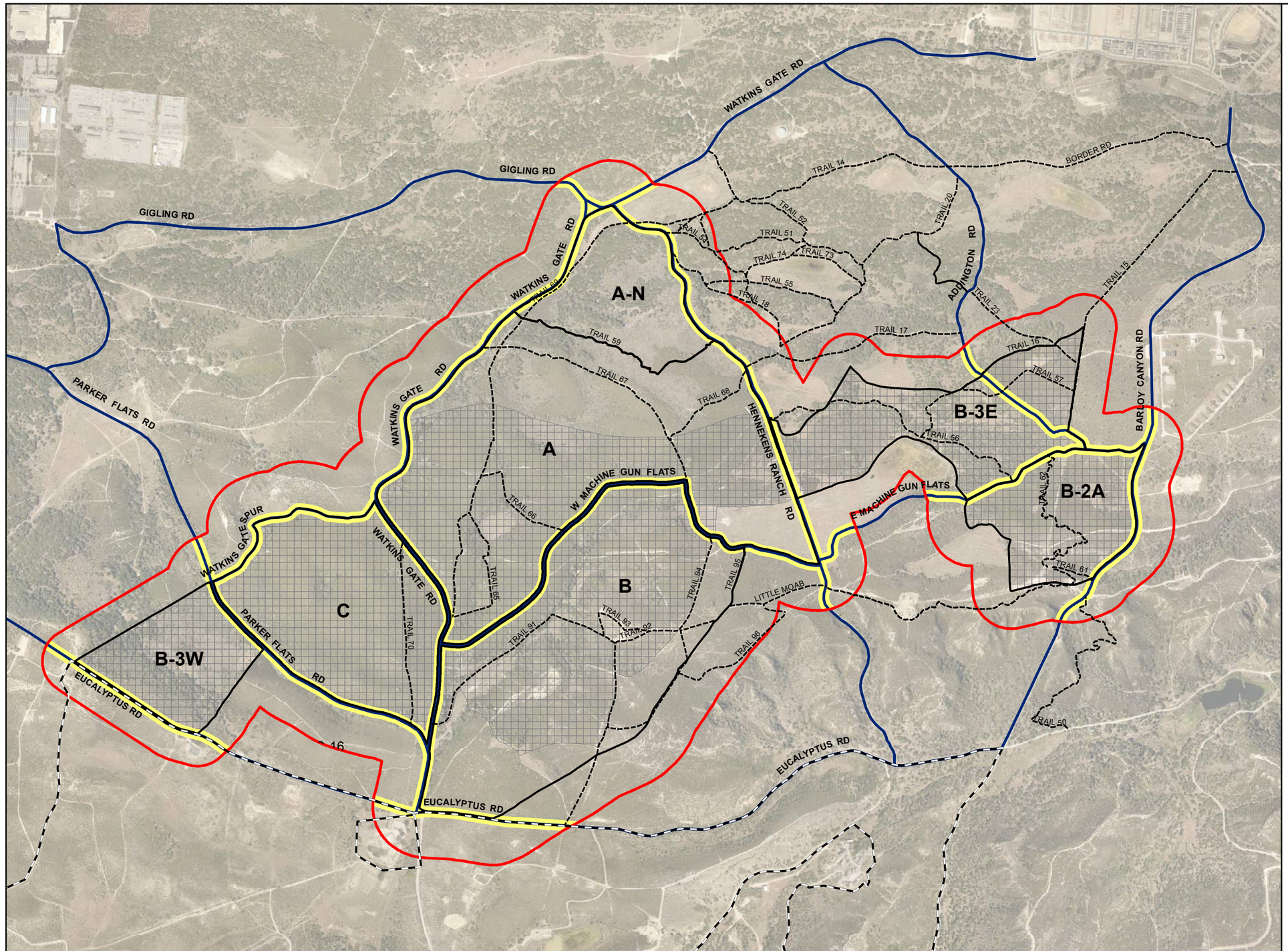

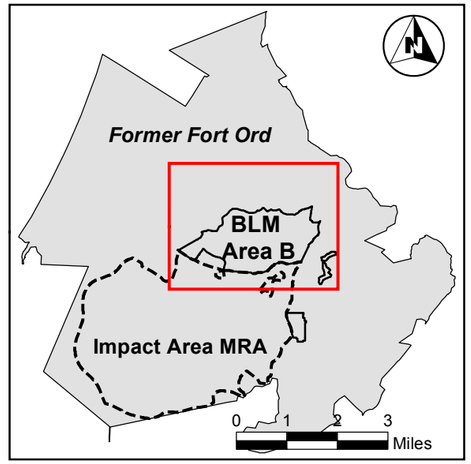

- Existing BLM Trail
- Roads
- Access Corridor Road
- Remedial Work Areas (Prescribed Burning or Cutting)
- Exclusion Zone (450 ft Masticator Operation Safe Distance)
- Remedial Work Grid
- Impact Area MRA

1,200 600 0 1,200
Feet

Fort Ord National Monument Munitions Cleanup
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 3

BLM Area B Work Areas and Existing BLM Trails

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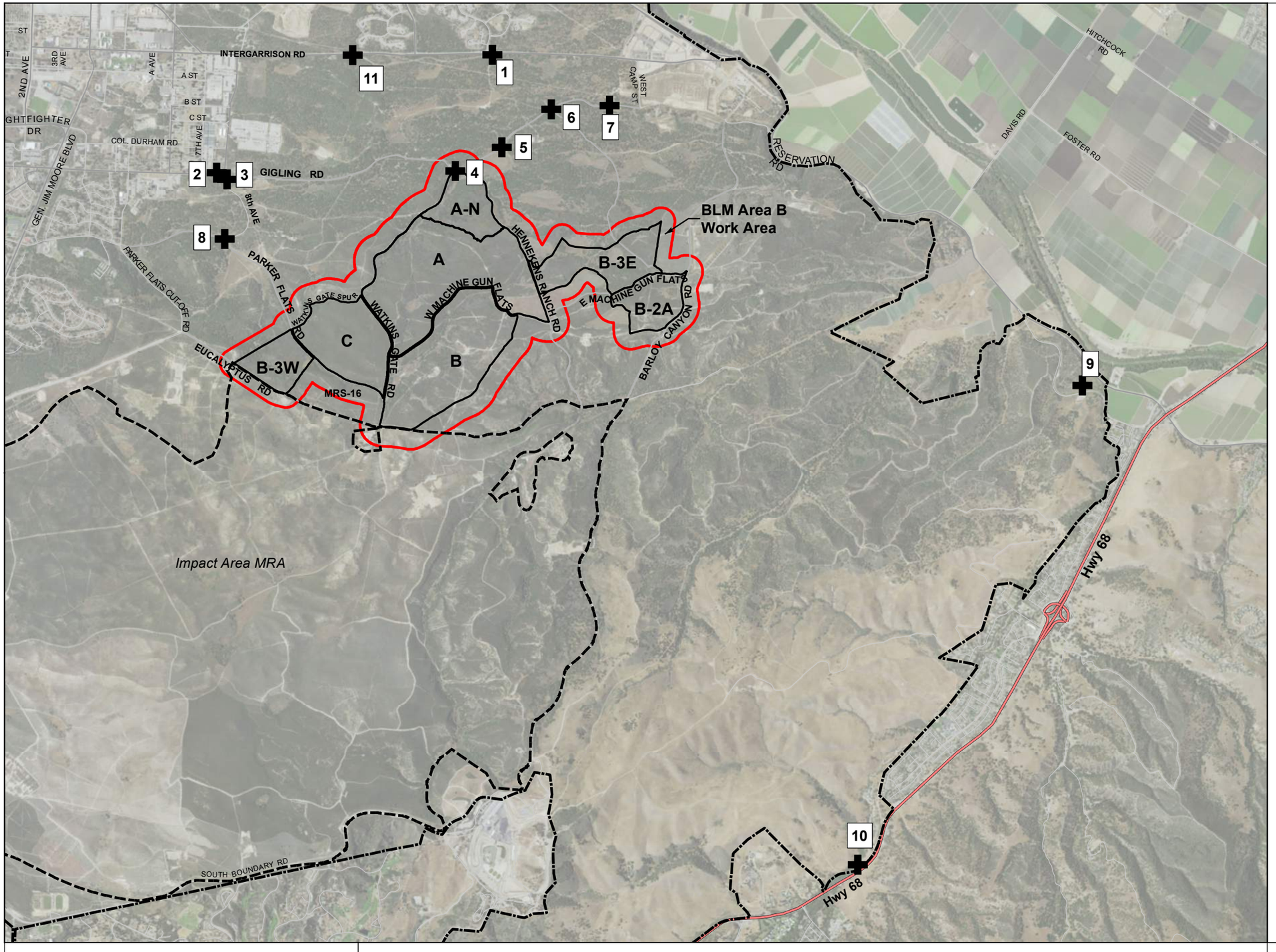

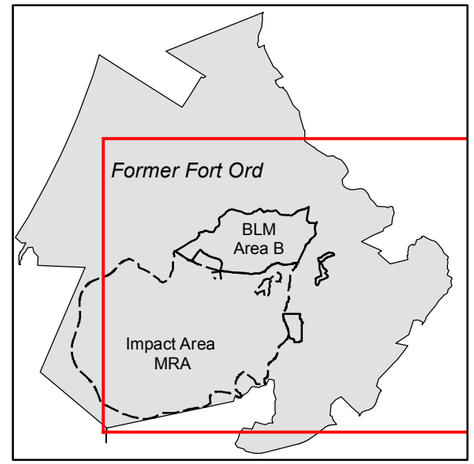

2 Outreach Location

Former Fort Ord Property Line

Impact Area MRA

Remedial Work Area

Exclusion Zone 450 feet

Location #	Location Name	Land Owner	Parcel #
1	Jerry Smith Corridor	FORA	L20.2.1
2	Gigling Parking Lot	Monterey Salinas Transit	L2.4.2
3	Gigling Rd and 8th Ave Extension	FORA	E19a.1
4	Gigling Rd and Watkins Gate Rd	FORA	E19a.4
5	Watkins Gate Rd and Trail 52	BLM FORA	F1.2/L20.2.1
6	Addington Rd and Watkins Gate Rd	FORA	L20.2.1
7	East Garrison at Watkins Gate Rd	FORA	L20.2.2
8	Parker Flats Rd and 8th Ave Extension	Army	F1.3
9	Creekside Terrace Parking	BLM	F1.1.1
10	Badger Hills Parking	BLM	F1.1.3
11	SGT MacDonald Trailhead	CSUMB	S1.3.2

3,300 0 3,300 Feet

Site Security Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Area B
Former Fort Ord, California

Figure 4

BLM Area B
Outreach Locations

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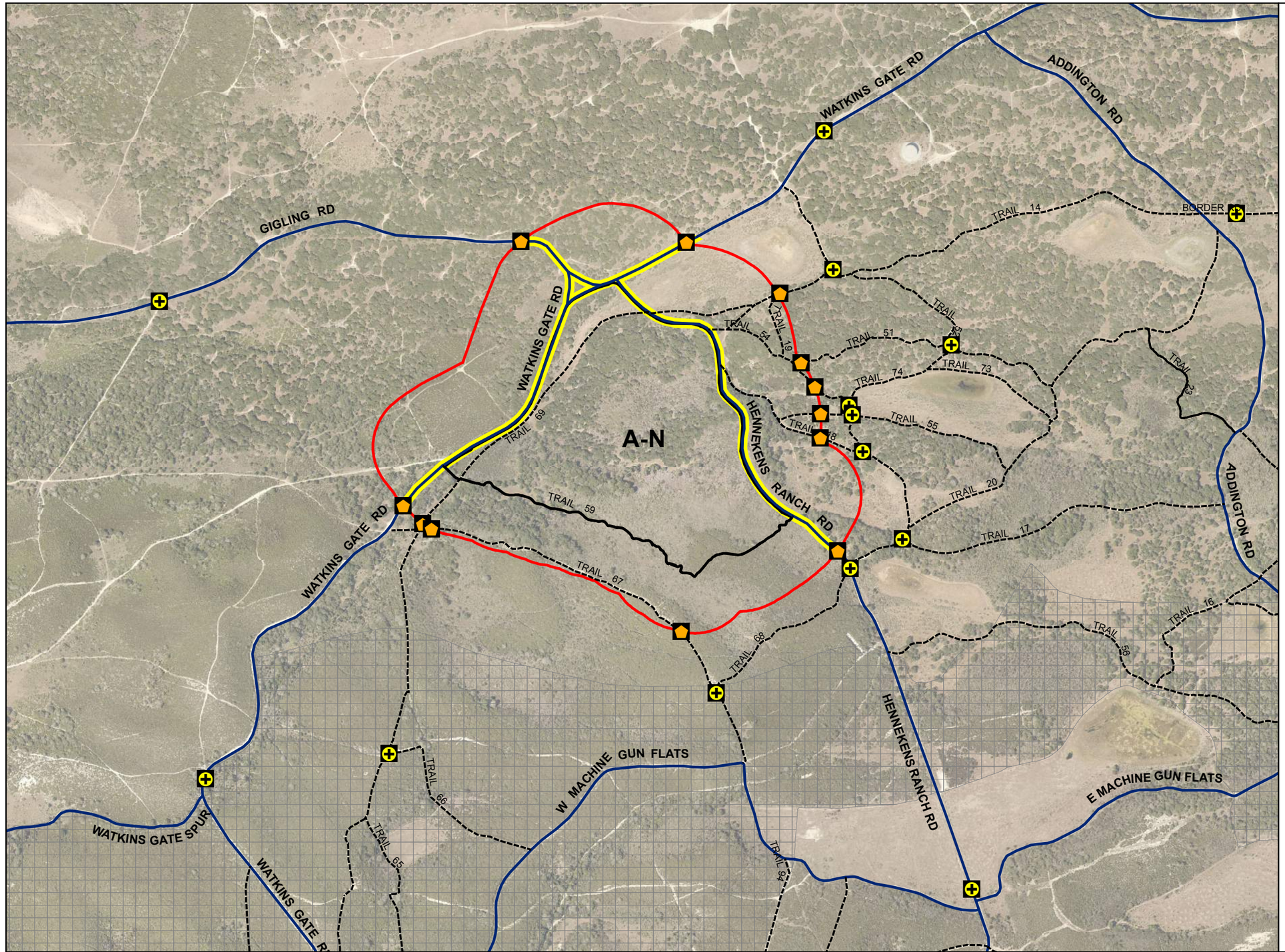

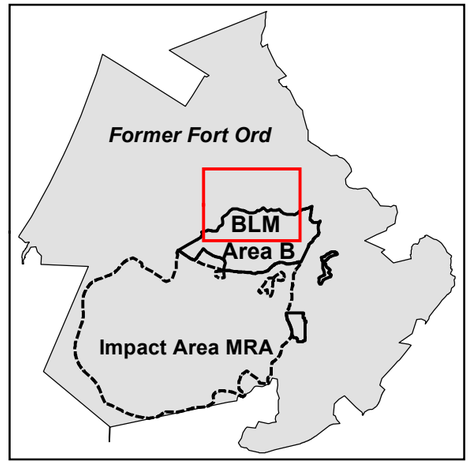

Signs and Barricades

- Notice Sign
- Warning Sign on Barricade
- Existing BLM Trail
- Road
- Access Corridor Road
- Exclusion Zone (450 feet)
- Remedial Work Area A-N
- Remedial Work Grid

800 0 800 Feet

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5a

BLM Area B
Work Area A-N Plan

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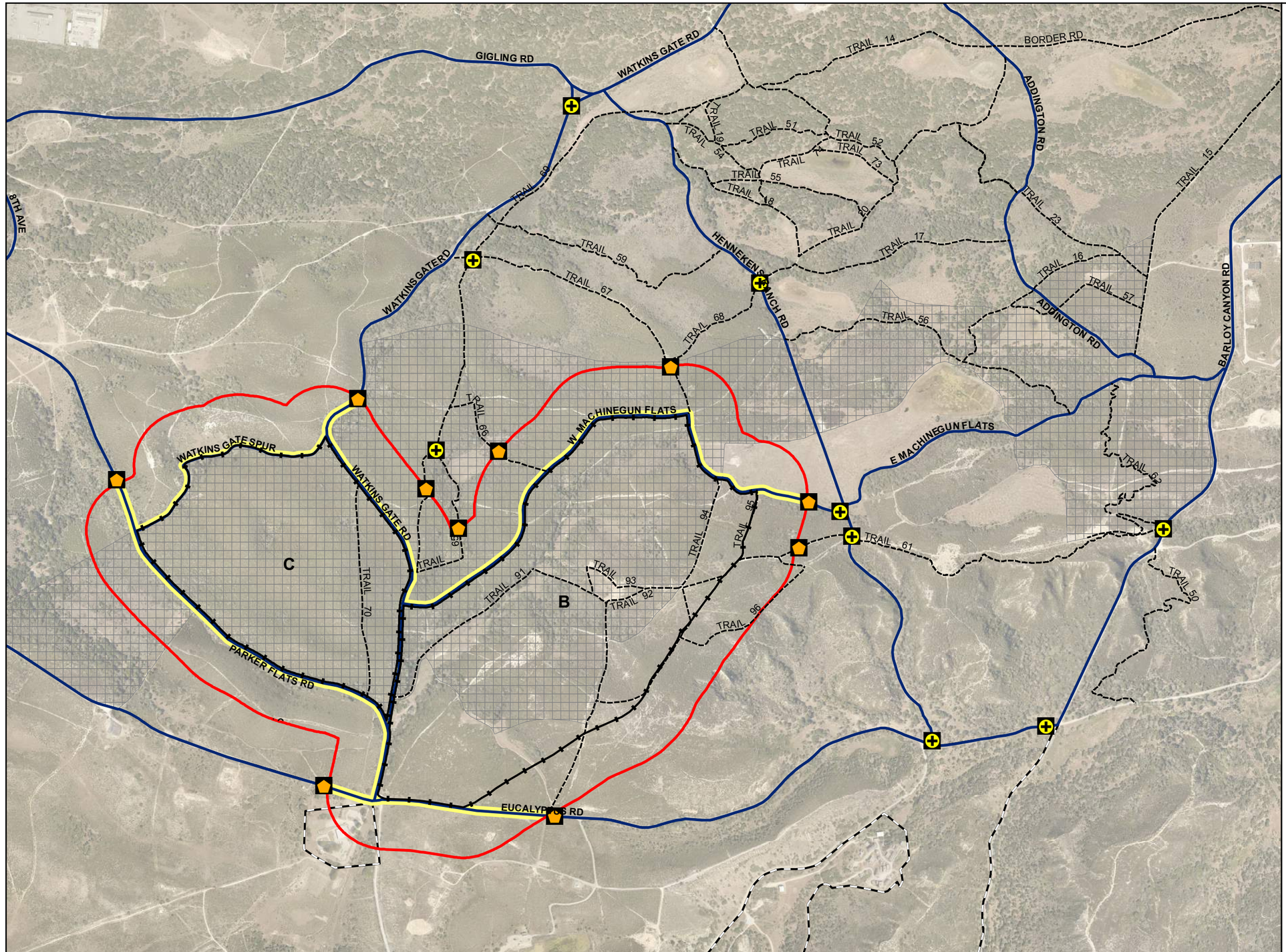

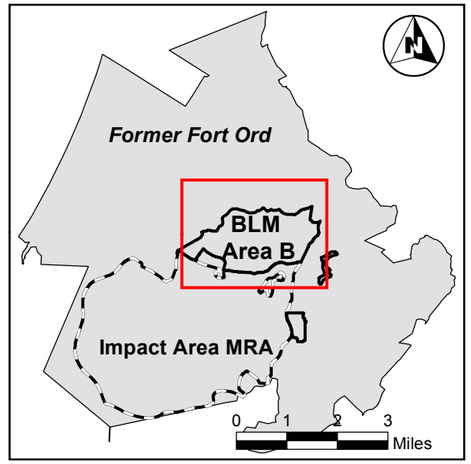

Existing BLM Trail

Road

Access Corridor Road

Area Closed - Work Area Exclusion Zone (600 Feet)

Remedial Work Area Fence

Remedial Work Grid

Impact Area MRA

Note:
Site security for prescribed burn events will be implemented according to the prescribed burn plan. Immediately after prescribed burning, a Remedial Work Area (RWA) fence will be installed and EZ will be established thereafter, the process will be the same as the cut RWAs. During burn prep activities, such as fuel breaks and containment line activities, the EZ will be established and maintained at 450 feet throughout the operations.

EZ = exclusion zone
RWA = remedial work area

1,200 0 1,200
Feet

KEMRON ENVIRONMENTAL SERVICES

Gilbane

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5b

BLM Area B
Work Areas B and C Plan

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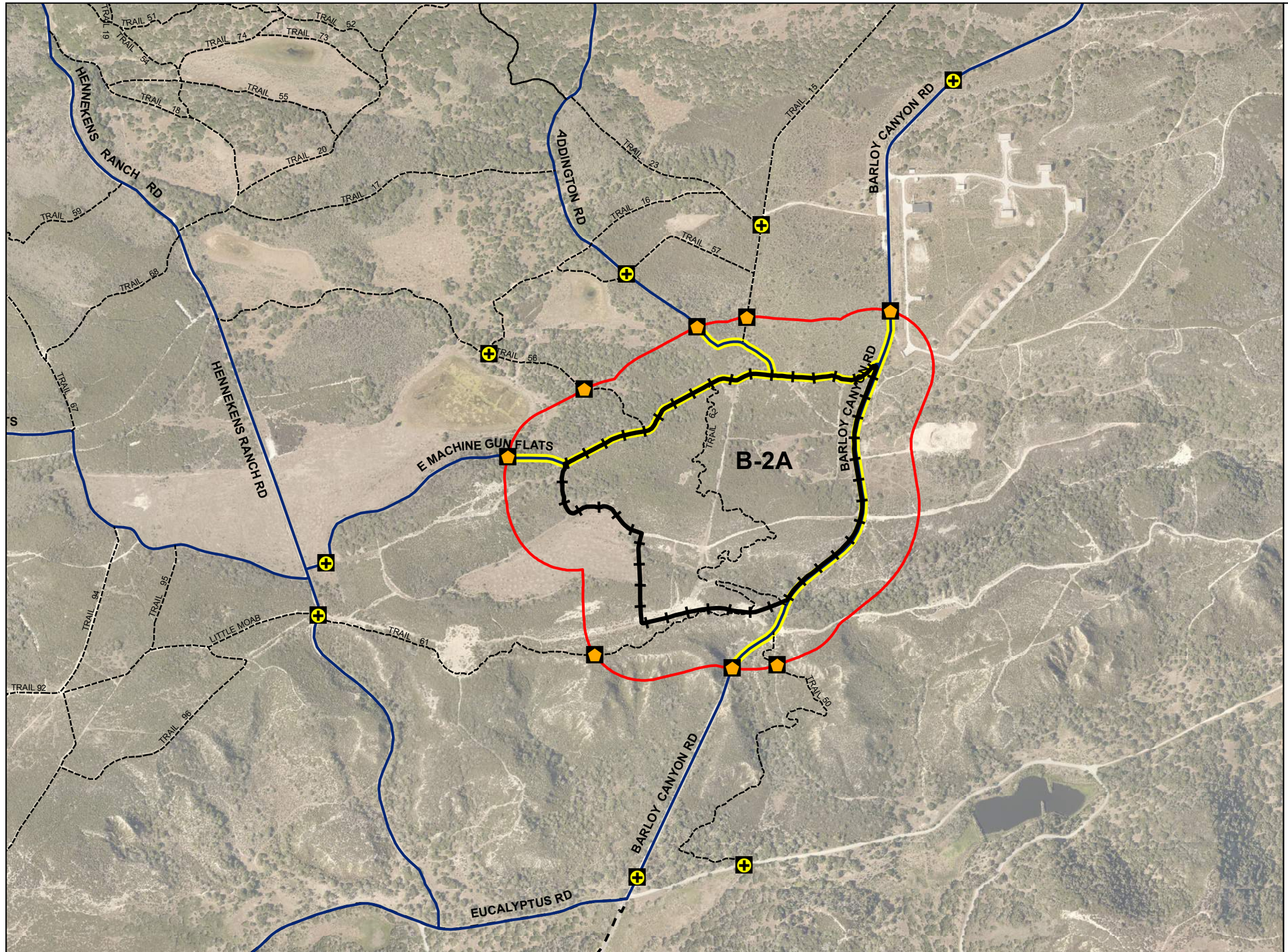

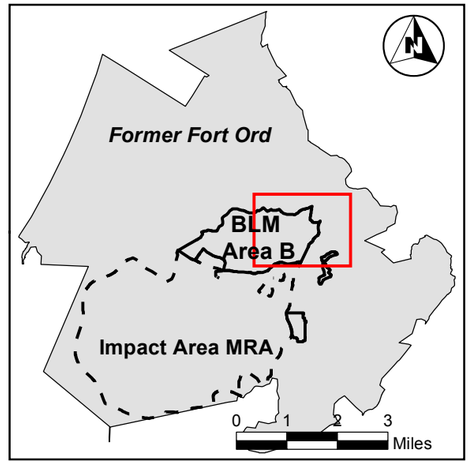

Signs and Barricades

- Notice Sign
- Warning Sign on Barricade
- Existing BLM Trail
- Road
- Access Corridor Road
- Exclusion Zone (450 feet)
- Remedial Work Area Fence with Danger Signs every 300 feet
- Impact Area MRA

1,000 0 1,000 Feet

KEMRON ENVIRONMENTAL SERVICES

Gilbane

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5c

BLM Area B
Work Area B-2A Plan

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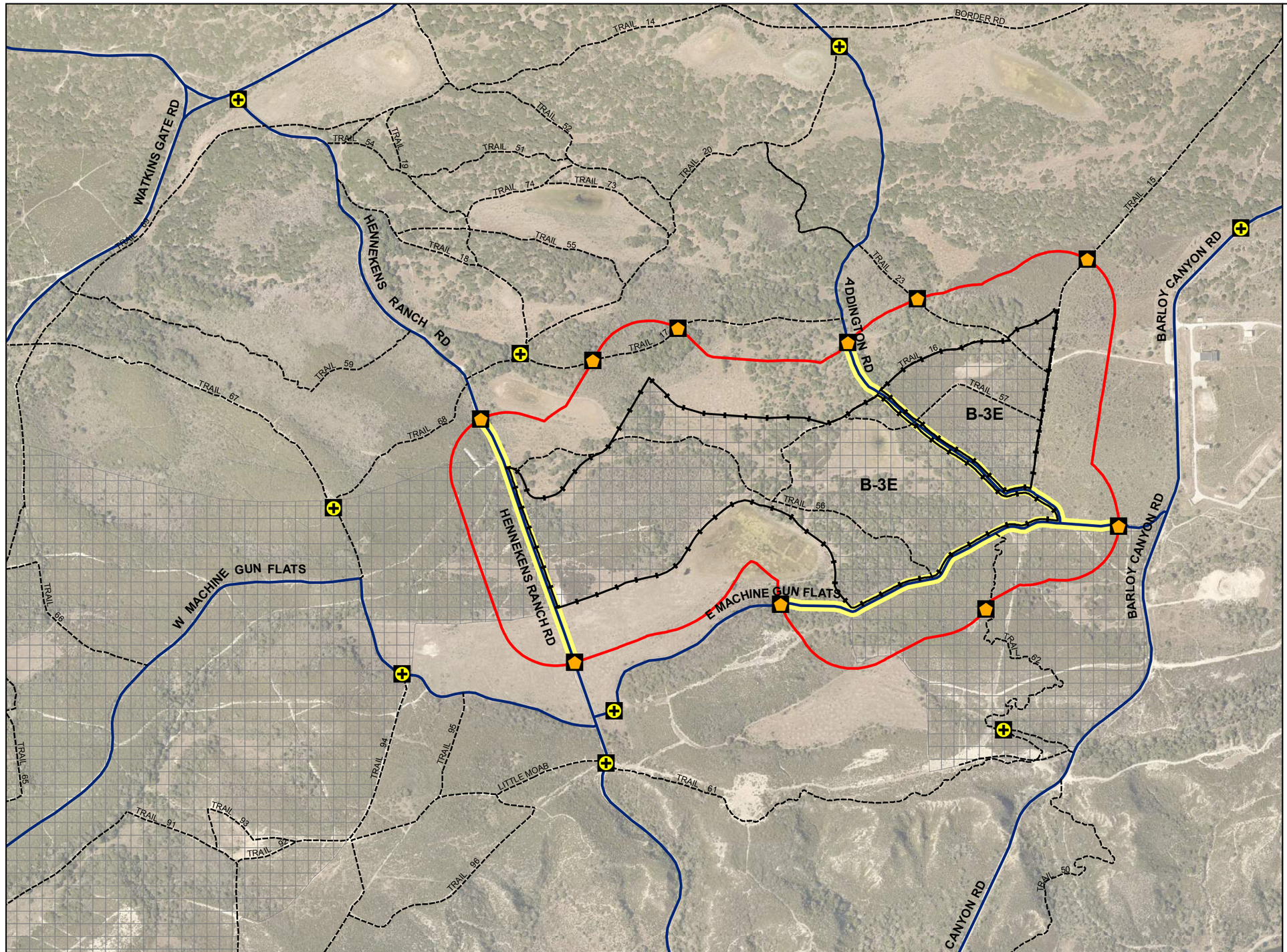

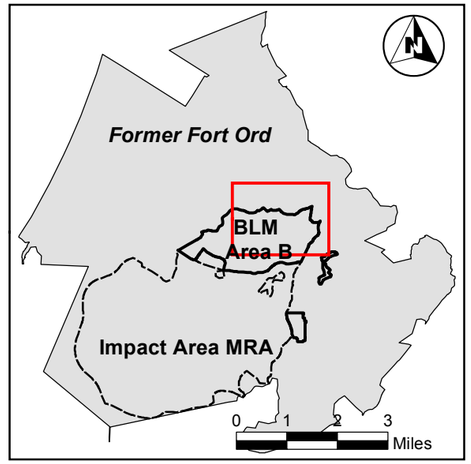

Signs and Barricades

- Notice Sign
- Warning Sign on Barricade
- Existing BLM Trail
- Road
- Access Corridor Road
- Exclusion Zone (450 feet)
- Fenced Work Area
- Remedial Work Grid

800 0 800 Feet

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5d

BLM Area B
Work Area B-3E Plan

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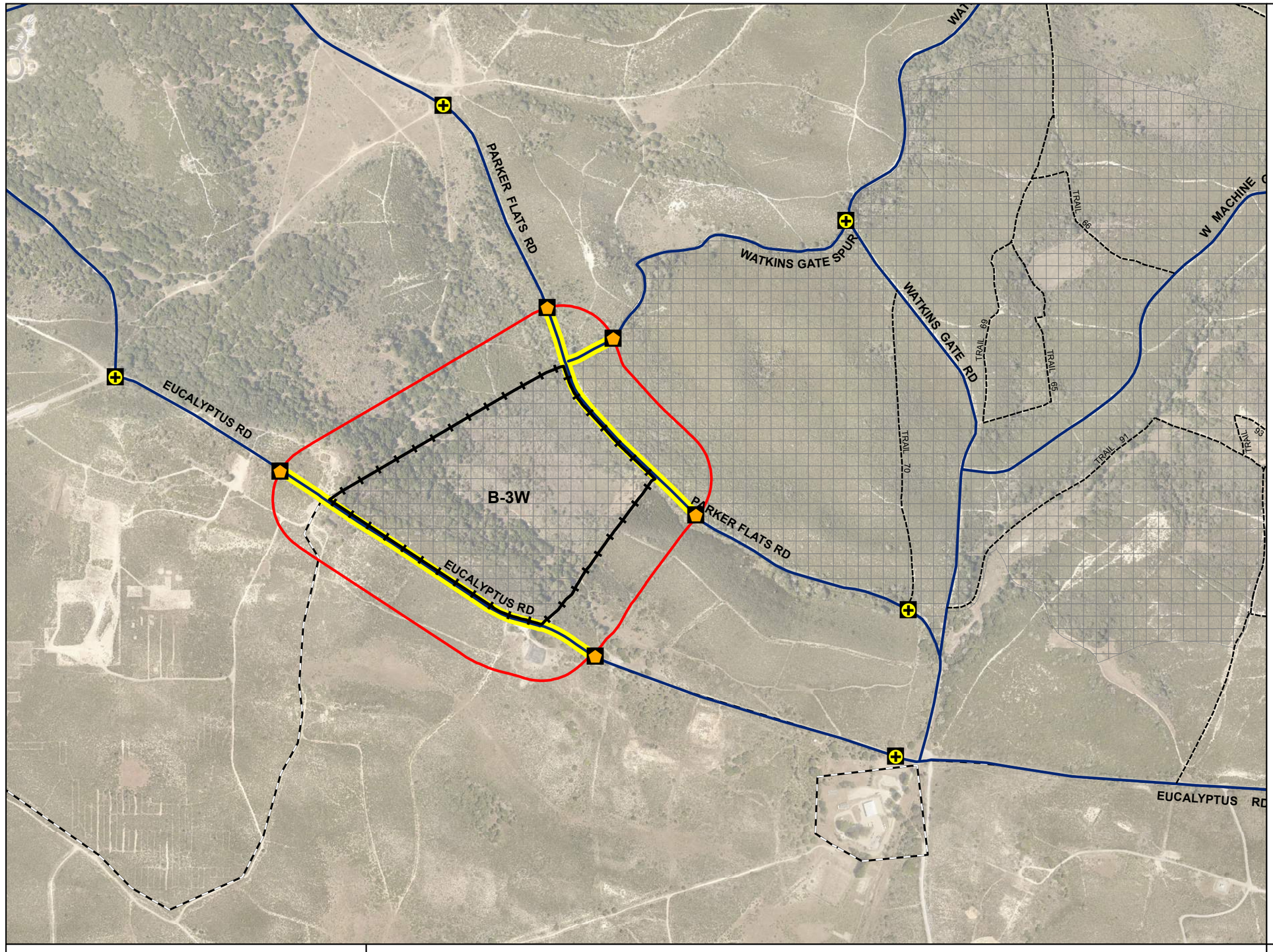

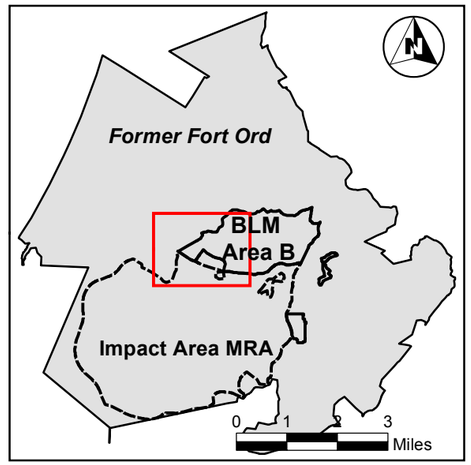

Signs and Barricades

- Notice Sign
- Warning Sign on Barricade
- Existing BLM Trail
- Road
- Access Corridor Road
- Exclusion Zone (450 feet)
- Remedial Work Area Fence
- Remedial Work Grid
- Impact Area MRA

800 0 800 Feet

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5e

BLM Area B
Work Area B-3W Plan

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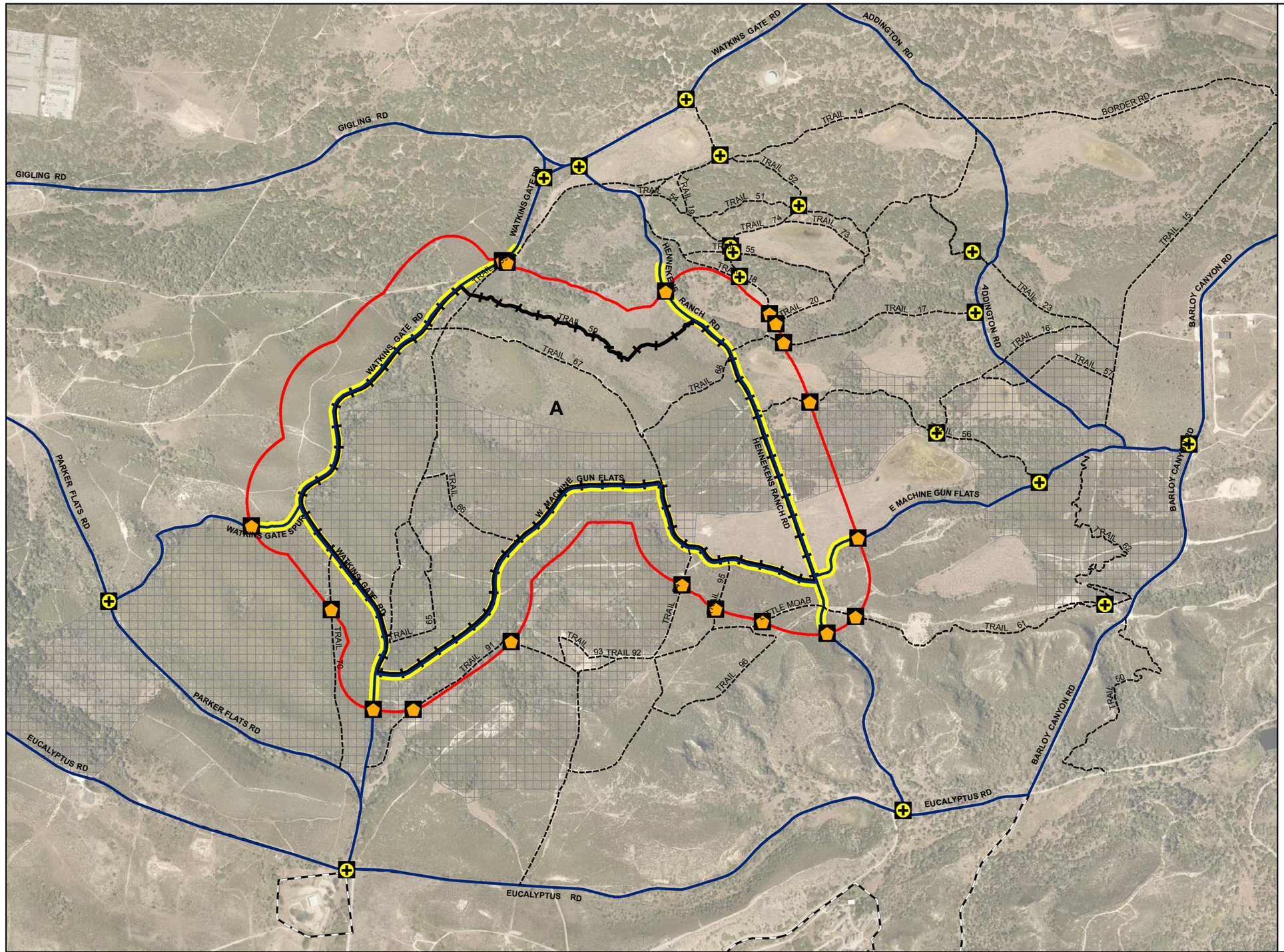

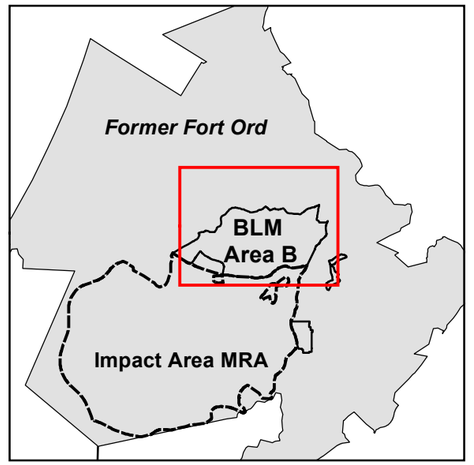

Signs and Barricades

- Notice Sign
- Warning Sign on Barricade
- Existing BLM Trail
- Road
- Access Corridor Road
- Exclusion Zone (450 feet)
- Remedial Work Area Fence
- Remedial Work Grid
- Impact Area MRA

Note:
Site security for prescribed burn events will be implemented according to the prescribed burn plan. Immediately after prescribed burning, a Remedial Work Area (RWA) fence will be installed and EZ (exclusion zone) will be established thereafter, the process will be the same as the cut RWAs. During burn prep activities, such as fuel breaks and containment line activities, the EZ will be established and maintained at 450 feet throughout the operations.

N

1,200 0 1,200 Feet

Site Security Plan
Munitions and Explosives of Concern Remedial Action
BLM Area B
Former Fort Ord, California

Figure 5f

BLM Area B
Work Area A Plan

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Attachment 1
Draft Signage

NOTICE

ROADS AND TRAILS
TEMPORARILY CLOSED AHEAD

Fort Ord National Monument

Munitions Cleanup

For more information:

U.S.Army 1-800-852-9699

www.fortordcleanup.com/programs/blm-area-b/

WARNING

Roads and Trails Temporarily Closed

Fort Ord National Monument Munitions Cleanup

For More Information:

U.S. Army 1-800-852-9699

www.fortordcleanup.com/programs/blm-area-b/

NO TRESPASSING
NO TRASPASAR

CA PC 602 (f), (k), (l), (m), (n), (o), (p)

43 C.F.R. § 8364.1 (d)

Title 18, U.S.C. Section 1382

DANGER PELIGRO

EXPLOSIVES AREA

KEEP OUT BY ORDER OF THE COMMANDER

AREA DE EXPLOSIVOS

MANTENGASE AFUERA POR ORDEN DEL COMANDANTE

TRESPASSERS WILL BE PROSECUTED
INTRUSOS SERAN PROCESADOS

CA PC 602 (f), (k), (l), (m), (n), (o), (p)
43 C.F.R. § 8364.1 (d)
Title 18, U.S.C. Section 1382

Attachment 2
Security Log Templates

Trespasser Log

Stopped (Y/N)	Name or Descpription	Method of Travel	Unit/Location	Date	Time	Photo(Y/N)	Work Delay

Signature:_____

Unauthorized Vehicle Log

Date	License Plate	Unit/Location	Make	Model	Color	Action

Signature:_____

Damage Log

Descpription	Unit/Location	Date	Time	Photo(Y/N)	Work Delay

Signature:_____

Changes in Security Log

Date	Orgininal Plan	Change	Reason	UXOSO Signature

APPENDIX C
Accident Prevention Plan

KEMRON
ENVIRONMENTAL SERVICES

TRANSMITTAL MEMORANDUM

To:	Distribution	**Date:**	February 23, 2016

Subject: Final, Basewide Accident Prevention Plan, Munitions and Explosives of Concern Removal and Soil Remediation, Revision 1, Former Fort Ord, California

DCN: SH4914-065

This submittal includes the Final, Basewide Accident Prevention Plan, Munitions and Explosives of Concern Removal and Soil Remediation, Revision 1, Former Fort Ord, California.

Below is a summary of changes made to this report:

- Removed duplicate signature page
- Records in Appendix B and Appendix C will be kept on site instead of in this report
- Updated the term "Material Safety Data Sheets (MSDSs)" with the current terminology – "Safety Data Sheets (SDSs)"
- Incorporated additional comments received on the Draft Final that reflect current Occupational Safety & Health Administration (OSHA) standards
- Replaced the Tailgate Safety Meeting form in Attachment 1 of the Site Safety and Health Plan (Appendix A) with the current version

Should you have any questions, please contact Steve Crane, KEMRON Project Manager, at (831) 824-2321 or by e-mail at scrane@kemron.com.

Distribution List: Final, Basewide Accident Prevention Plan, Munitions and Explosives of Concern Removal and Soil Remediation, Revision 1, Former Fort Ord, California

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1		Mr. James Specht	Department of the Army, USACE	1325 J Street	Sacramento, CA	95814
1		Mr. Michael Wheeler	Department of the Army, USACE	1325 J Street	Sacramento, CA	95814
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1		Mr. Therman Franks	Department of the Army, USACE	4101 Jefferson Plaza NE	Alburquerque, NM	87109
1		Mr. David Eisen	Department of the Army, USACE	4463 Gigling Road	Seaside, CA	93955
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1		Ms. Tracy Bergquist	KEMRON Environmental Services	1359 Ellsworth Ind. Blvd	Atlanta, GA	30318
1		Ms. Jeanette Hamm	KEMRON Environmental Services	1359 Ellsworth Ind. Blvd	Atlanta, GA	30318
1		Mr. Leland Meadows	KEMRON Environmental Services	1359 Ellsworth Ind. Blvd	Atlanta, GA	30318
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1	1	Ms. Audrey Johnson	KEMRON Environmental Services	4522 Joe Lloyd Way	Monterey, CA	93944
1		Ms. Erin Caruso	Gilbane	1655 Grant St, Floor 12	Concord, CA	94520
1		Mr. Chuck Clyde	Gilbane	4522 Joe Lloyd Way	Monterey, CA	93944

Approved: EISEN.DAVID.E.1231985146

Digitally signed by EISEN.DAVID.E.1231985146
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=EISEN.DAVID.E.1231985146
Date: 2016.02.23 09:46:31 -08'00'

David Eisen
USACE Project Manager

BASEWIDE ACCIDENT PREVENTION PLAN
Munitions and Explosives of Concern Removal and Soil Remediation
Former Fort Ord, California

Date: February 2016
Version: Final, Revision 1

Prepared for

U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814

Contract No. W912DY-10-D-0027 Task Order CM01

Prepared by

KEMRON Environmental Services, Inc.
1359A Ellsworth Industrial Blvd.
Atlanta, GA 30318
404-636-0928

BASEWIDE ACCIDENT PREVENTION PLAN
Munitions and Explosives of Concern Removal and Soil Remediation
Former Fort Ord, California

Date: February 2016
Version: Final, Revision 1

Prepared by: Daniel Robinson — Digitally signed by Daniel Robinson DN: cn=Daniel Robinson, o=KEMRON Environmental Services, Inc., ou, email=drobinson@kemron.com, c=US Date: 2016.02.18 15:05:03 -05'00' — Date: February 18, 2016
Daniel Robinson
Certified Hazardous Materials Manager Project Scientist, KEMRON

Reviewed by: Val Valdez — Digitally signed by Val Valdez DN: cn=Val Valdez, o=Kemron Environmental, ou, email=vvaldez@kemron.com, c=US Date: 2016.02.18 13:28:21 -08'00' — Date: February 18, 2016
Val Valdez
UXO Safety Officer, KEMRON

Reviewed by: Bruce McClain — Digitally signed by Bruce McClain DN: cn=Bruce McClain, o=KEMRON Environmental Services, ou=Former Ft. Ord, email=bmcclain@kemron.com, c=US Date: 2016.02.18 13:36:20 -08'00' — Date: February 18, 2016
Bruce McClain
UXO Quality Control Specialist, KEMRON

Reviewed by: Jeanette Hamm — Digitally signed by Jeanette Hamm DN: cn=Jeanette Hamm, o=KEMRON Environmental Services, Inc., ou=KEMRON, email=jhamm@kemron.com, c=US Date: 2016.02.22 17:25:12 -05'00' — Date: February 22, 2016
Jeanette Hamm, PE
Technical Editor, KEMRON

Reviewed by: Steven K. Fess CIH, CSP — Digitally signed by Steven K. Fess CIH, CSP DN: cn=Steven K. Fess CIH, CSP, o=KEMRON Environmental Services, Inc., ou=Corporate Health and Safety, email=sfess@kemron.com, c=US Date: 2016.02.22 22:21:36 -05'00' — Date: February 22, 2016
Steven Fess, CIH, CSP
Corporate Health and Safety Manager
Corporate Certified Industrial Hygienist, KEMRON

Reviewed by: Erin Caruso Digitally signed by Erin Caruso DN: C=US, E=ecaruso@gilbaneco.com, O=Gilbane, OU=Gilbane Federal, CN=Erin Caruso Location: Gilbane Reason: I am approving this document Contact Info: ecaruso@gilbaneco.com Date: 2016.02.23 08:35:04-08'00' Date: 2/23/2016

Erin Caruso, PE, PMP
Deputy Project Manager, Gilbane

Approved by: Steve Crane Digitally signed by Steve Crane DN: cn=Steve Crane, o=KEMRON, ou, email=scrane@kemron.com, c=US Date: 2016.02.23 08:58:06 -08'00' Date: 2/23/2016

Stephen Crane, PE, F.SAME
Senior Project Manager, KEMRON

KEMRON Environmental Services, Inc. (KEMRON) has been contracted by the United States Army Corps of Engineers (USACE) Sacramento District under the Worldwide Environmental Remediation Services for Munitions and Explosives of Concern (MEC) Removal and Soil Remediation activities at the Former Fort Ord, California. This Accident Prevention Plan (APP) has been prepared in accordance with the USACE EM 385-1-1, Safety and Health Requirements Manual, by KEMRON to identify and address physical, chemical, and environmental hazards which may potentially affect employees, subcontractors, and site visitors. This APP has been prepared for the USACE pursuant to and in accordance with Contract No. W912DY-10-D-0027, Task Order CM01.

The signatures above indicate that this APP has been prepared and reviewed by qualified Health and Safety personnel and has been approved for implementation by KEMRON's Project Manager.

Table of Contents

Table of Contents (cont.)

List of Figures

List of Tables

List of Appendices

Acronyms

Acronym	Definition
µ	Micron
%LEL	Percent by Volume of the Lower Exposure Limit
$\%O_2$	Percent by Volume of Oxygen
ABIH	American Board of Industrial Hygiene
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analyses
APF	Assigned Protection Factor
APP	Accident Prevention Plan
APR	Air-Purifying Respirator
ASR	Air-Supplying Respirator
ATF	Bureau of Alcohol, Tobacco, Firearms, and Explosives
BCSP	Board of Certified Safety Professionals
BIP	Blown in Place
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
CESPK	US Army Corp of Engineers Sacramento District
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CO_2	Carbon Dioxide
COPC	Contaminants of Potential Concern
COR	Contracting Officer's Representative
CP	Certified Professional
CPR	Cardiopulmonary Resuscitation
CSHM	Corporate Safety and Health Manager
CSP	Certified Safety Professional
DFWP	Drug Free Work Place
DHHS	Department of Health and Human Services
DOT	Department of Transportation
EH&S	Environmental Health and Safety
EMR	Experience Modification Rate
EOD	Explosives Ordnance Disposal
F. SAME	Fellow, Society of American Military Engineers
FAR	Federal Acquisition Regulation
ft.	Feet
GHS	Globally Harmonized System
H:1V	Horizontal to 1 Vertical
HAZCOM	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HR	Human Resources
HTW	Hazardous Toxic Wastes
IDLH	Immediately Dangerous to Life and Health

Acronym	Definition
KEMRON	KEMRON Environmental Services, Inc.
LOTO	Lockout/Tagout
m	Meter
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA	Military Response Actions
MRS	Munitions Response Sites
MUC	Maximum Use Concentration
NFPA	National Fire Protection Association
ng/ml	Nanogram/Milliliter
NIOSH	National Institute for Occupational Safety and Health
NRMA	Natural Resource Management Area
OE	Ordnance and Explosives
OESS	Ordnance and Explosives Safety Specialist
OSHA	Occupational Safety & Health Administration
PAPR	Powered Air-Purifying Respirators
PE	Professional Engineer
PEL	Permissible Exposure Limit
PG	Professional Geologist
PM	Project Manager
PMP	Project Management Professional
POM	Presidio of Monterey
PPE	Personal Protective Equipment
QC	Quality Control
REL	Recommended Exposure Limits
ROD	Record of Decision
RSO	Radiation Safety Officer
SCBA	Self Contained Breathing Apparatus
SDS	Safety Data Sheets
SOP	Standard Operating Procedure
SOW	Statement of Work
SSHO	Site Safety and Health Officer
SSHP	Site-Specific Safety and Health Plans
SUXOS	Senior UXO Supervisor
TLV	Threshold Limit Value
TM	Task Manager
TO	Task Order
USACE	United States Army Corps Of Engineers
UXO	Unexploded Ordnance
UXOSO	UXO Safety Officer
WBGT	Wet Bulb Globe Temperatures
WP	Work Plan

Project Specific Safety Orientation – Sign-Off Sheet

Review and Acceptance of the APP is required for all KEMRON site staff, visitors, and designated subcontractors' competent personnel. Subcontractors' competent safety person is to provide training on this plan to their company's project personnel and to sign the analogous form with their employees.

PROJECT-SPECIFIC HEALTH AND SAFETY ORIENTATION

CONDUCTED BY KEMRON's SITE SAFETY & HEALTH OFFICER

I have received site-specific information and orientation regarding project safety and health management system and the identified physical, chemical, and environmental hazards recognized or anticipated and their proper control at the Former Fort Ord Sites.

• Accident reporting procedures • Activity Hazard Analysis • Environmental hazards • Emergency procedures • Emergency telephone numbers • Daily safety inspections • Chemical hazards • Physical hazards • Heavy equipment and vehicle safety • Inclement weather and shut-down condition • Noise • Slips, trips, and falls • Ultraviolet exposure • Flammable and combustibles, storage, use, fire and explosion prevention	• Hazard communication program • Hazardous waste operations and emergency response (HAZWOPER) • Site regulations and housekeeping • Fall Protection • Proper conduct • Proper work attire • Review of safety duties • Safety meetings, types and frequencies • Safety training and competencies, certificates required • Training and competencies required • Use and care of personal protective equipment (PPE)

I am aware of, understand, and agree to comply with all applicable requirements, safety rules, policies, and procedures for the KEMRON project named within this document. My signature certifies that I have reviewed and understand the procedures, equipment, and restrictions applicable to this project and agree to abide by them.

SIGNATURE	PRINTED NAME	COMPANY	DATE

SECTION 1 PROJECT & BACKGROUND INFORMATION

1.1 Contractor/Subcontractor

KEMRON/Gilbane

1.2 Contract Number

Contract No. W912DY-10-D-0027 – Task Order CM01

1.3 Project Name

MEC Removal and Soil Remediation, Former Fort Ord, California

1.4 Site History and Brief Description of Work to Be Performed

1.4.1 Site History

The former Fort Ord is adjacent to Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco. The base consists of approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. Highway 1 passes through the western part of the former Fort Ord, separating the beachfront portions from the rest of the base. Laguna Seca Recreation Area and Toro Regional Park also border the former Fort Ord to the south and southeast, respectively, as well as several small communities along Highway 68. Figure 1 illustrates the Site Location and Features for former Fort Ord.

Beginning with its founding in 1917, Fort Ord served primarily as a training and staging facility for infantry troops. Former Fort Ord was a basic training center from 1947 to 1974 and the 7th Infantry Division was activated at the former Fort Ord on 21 October 1974. The 7th Infantry Division was converted to a light division in 1983. Light infantry troops operate without heavy tanks, armor, or artillery. In 1991, Fort Ord was selected for closure and the post was officially closed in 1994. Remedial Investigations and cleanup actions at the former Fort Ord have been performed and documented since 1986.

Before the Army's use of the property, the area was agricultural, as is much of the surrounding land today. The Army originally bought the present day East Garrison and nearby lands on the east side of the former Fort Ord in 1917 to use as a maneuver and training ground for field artillery and cavalry troops stationed at the Presidio of Monterey (POM). No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed.

In 1938, additional agricultural property was purchased for the development of the Main Garrison. At the same time, the beachfront property was donated to the Army. The Main Garrison was constructed between 1940 and the 1960s, starting in the northwestern corner of

the base and expanding southward and eastward. During the 1940s and 1950s, an area within the Main Garrison was utilized as a small airfield. In the early 1960s, construction of the Fritzsche Army Air Field was completed. The smaller Main Garrison airfield was then decommissioned, and its facilities were redeveloped as motor pools and other facilities.

Impact Area Munitions Response Area (MRA)

The Impact Area MRA includes a large number of ranges that have various historical uses, designs, and characteristics (MACTEC, 2007). Over the years, various types of munitions have been used during training activities within the Impact Area MRA, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms. Select ranges were used for small arms training activities only, while other ranges are characterized as multi-use. The firing ranges were located along the perimeter of the Historical Impact Area such that weapons firing activity was generally directed toward the center of the Historical Impact Area. The Historical Impact Area encompassed an area bounded by Eucalyptus Road to the north, General Jim Moore Boulevard to the west, South Boundary Road to the south, and Barloy Canyon Road to the east. Training activities at the Impact Area MRA ceased after the closure of the former Fort Ord in 1994.

BLM Area B

Bureau of Land Management (BLM) Area B East is in the northeastern portion of the former Fort Ord. The property was purchased from private landowners by the government in 1917. The Track 2 Munitions Response Sites (MRSs) in the northern portion include MRS-12 and MRS-21, comprising approximately 43 acres. The Track 2 MRSs in the southern portion include MRS-14D (including small portions of MRS-14B and MRS-14E), MRS-25, and MRS-26, covering approximately 98 acres.

BLM Area B North is in the northeast-central portion of the former Fort Ord north of Eucalyptus Road. The MRSs located in this area include: MRS-09, MRS-10A, MRS-10B, MRS-19, MRS-27I, MRS-41, MRS-48, MRS-54, MRS-56, MRS-58, MRS-27H; portions of MRS-53BLM, MRS-27G, and MRS-27J Additional areas adjacent to and in-between the MRSs are included in BLM Area B North.

Basewide Range Assessment (BRA)

A majority of Site 39 is encompassed within the footprint of the Impact Area MRA. Over the years, various types of ordnance have been used or found in the Inland Ranges, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms ammunition. Some training activities using petroleum hydrocarbons also were conducted. The 2.36-inch Rocket Range north of the Impact Area MRA reportedly was used for anti-armor (bazooka) training during and shortly after World War II.

The proposed future use of most of the Inland Ranges will be as a Natural Resource Management Area (NRMA) and as habitat reserve areas. These areas will be managed by the U.S. Department of the Interior, BLM, and public access will be restricted. Several areas within - but along the periphery of- the Inland Ranges, have a proposed future land use other than as an NRMA. The Military Operations on Urban Terrain Area, near the northeastern edge of the Inland Ranges, is proposed for use as a peace officer training area. The areas along the southern and western boundaries of the Inland Ranges are designated for future development under the *Reuse Plan* and *Habitat Management Plan*.

The remedial action for the Site 39 Inland Ranges at the former Fort Ord was originally identified in the *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California* dated January 13, 1997 (Army, 1997). The 1997 Record of Decision (ROD) serves as the Basewide ROD. The selected remedy identified in the Basewide ROD addressed the risks to human health from lead contamination in soils co-located with bullets, bullet fragments, and explosive constituents in soils from MEC usage at the Site 39 Inland Ranges. The Basewide ROD identified the selected remedy for the Site 39 Inland Ranges as "Excavation and Onsite Placement at the Operable Unit 2 Landfill Beneath a Cap" at the former Fort Ord based on the protection of human health for reuse of the site as a habitat reserve. The remedy implementation at select ranges is discussed in the *Draft Site 39 Remedial Action Completion Report* (Gilbane, 2014).

The BRA Report summarized the status of site investigation for the presence of contaminants of potential concern (COPCs) (metals and explosives) at known or suspected small arms ranges, multi-use ranges, and military munitions training areas within the former Fort Ord, including those within Site 39 (MACTEC/Shaw, 2012).

The objective of the Comprehensive BRA investigation activities described in the report was to (1) ascertain whether the COPCs could be present in sufficient amounts to necessitate remediation, and if remediation was warranted based on available information, to determine the area(s) within a site where remediation should be recommended; (2) identify which ranges can be eliminated from consideration for potential remediation; and (3) identify sites that require additional investigation, or should be considered for remediation.

The Comprehensive BRA process involved five steps: (1) review of historical documents including historical training maps, historical aerial photographs, range control records, and military munitions after action removal reports; (2) site reconnaissance and mapping; (3) limited soil sampling for screening purposes; (4) site characterization; and (5) remediation/ habitat mapping. This investigation identified areas of additional soil contamination associated with ranges within Site 39 and resulted in a significant increase in the volume of soil to be excavated at the site.

Under the Comprehensive BRA, soil sampling within Site 39 will occur as necessary following the remaining MEC remediation actions and site investigation. Additional areas may be identified following MEC remediation being conducted in accordance with the Site 39 Inland

Ranges Habitat Restoration Plan, in accordance with the *Final ROD Amendment* issued by the Army on August 25, 2009 (Army, 2009).

1.4.2 Scope of Work

The scope of work for the former Fort Ord project consists of the following primary activities:

- Road Improvements and Other Preparatory Activities
- Primary Containment Line Preparation
- Surface MEC Removal Within Primary Containment Lines
- Prescribed Burn Operations
- Vegetation Clearance
- Grid/Boundary Survey
- Technology-Aided Surface MEC Removal
- Management of Material Potentially Presenting an Explosive Hazard (MPPEH) in BLM Area B
- Geophysical Surveys
- Subsurface MEC Removal
- Sifting
- Munitions/Range-Related/Other Debris Recycling/Disposal
- BRA

1.5 Contractor Accident Experience

KEMRON is an established environmental consulting and construction company with a strong safety culture, whose occupational injury and illness rates are summarized below:

Table 1-1 Contractor Accident Experience

Year	KEMRON Total Man-hours worked	KEMRON Lost Work Day Incident Rate	KEMRON OSHA** Recordable Rate or Total Incidents Rate	KEMRON Experience Modification Rate (EMR)
2015	*	*	*	0.78
2014	278,501	0.00	2.87	0.81
2013	339,365	0.59	1.18	0.84
2012	335,941	0.00	0.60	0.84

Year	KEMRON Total Man-hours worked	KEMRON Lost Work Day Incident Rate	KEMRON OSHA** Recordable Rate or Total Incidents Rate	KEMRON Experience Modification Rate (EMR)
2011	300,371	0.00	0.00	0.84
2010	286,520	0.00	0.70	0.84
2009	242,975	0.00	0.82	0.92
2008	287,335	0.00	2.78	0.88
2007	399,283	0.00	1.00	0.95
2006	384,300	0.00	1.04	0.85
2005	348,219	0.57	1.72	0.84
2004	339,857	0.00	1.18	0.81

* Data will be available upon completion of the 2015 calendar year.
** Occupational Safety & Health Administration

1.6 Phases of Work Requiring an Activity Hazard Analysis

Each individual work activity will require the preparation of an Activity Hazard Analysis (AHA) which shall be submitted to the project manager for review, completion, and approval prior to starting the activity. The approved AHAs will be included in the Site Safety and Health Plan (SSHP) and will remain accessible on-site for viewing by all site personnel. All current KEMRON AHA's are located in the SSHP which is Appendix A of this APP. The following project tasks have been identified for this project:

1. Plan Preparation
2. Mobilization
3. Site Preparation / Survey / Escorting
4. Brush Clearing / Prescribed Burns
5. Surface / Sub-Surface Clearance / EM61-MK2 Survey
6. Anomaly Detection and Excavation
7. Mechanical Soil Screening
8. MEC Disposal
9. MPPEH Certification and Shipping
10. Soil Sampling
11. Site Restoration
12. Demobilization

Several of the project tasks will overlap and some activities will occur concurrently or in a phased approach. Activities for which an AHA will be required will be reassessed prior to the start of the activity. This APP is considered an evergreen document that will be amended and edited as site work progresses.

SECTION 2 STATEMENT OF SAFETY AND HEALTH POLICY

2.1 Corporate Policy on Workplace Health and Safety

Purpose and Scope

It is the intent of KEMRON to provide and maintain safe and healthful working conditions and to establish standard operating procedures that safeguard employees and enable operational efficiency. It shall be the responsibility of all employees and contractors to utilize safe work practices, maintain a safe and healthful working environment, and comply with KEMRON required and all applicable site specific procedures, federal, state, and local codes and regulations in the performance of their work related activities. Failure to abide by the applicable requirements of the KEMRON Corporate Environmental, Health and Safety Manual or project-specific health and safety requirements will result in disciplinary action, up to and including termination of employment.

Key elements of KEMRON's corporate safety culture include:

- A corporate Safety and Health Program based on established OSHA safety and health policies and procedures, that includes ongoing Safety and Health training, annual medical monitoring programs, and the development of site-specific Safety and Health plans that fully comply with OSHA Standards 29 Code of Federal Regulations (CFR) 1910 and 1926; Federal Acquisition Regulation (FAR) accident prevention 52236.13; USACE EM 385 1-1, and any other federal, state and/or local regulations.
- Safety incentive programs that reward safe behaviors exhibited by employees such as "Caught in the Act…of Safety"; celebrations to recognize excellence in safety performance; and project based safety awards when project safety goals are met or exceeded.
- Use of behavior based programs such as observation/intervention programs for encouraging and rewarding safe work practices.
- Integration of safety management into every operation through the development of active safety teams and operational safety leaders at each KEMRON location.
- Encouraging off-the-job employee safety and healthy life choices through sponsorship of annual health and wellness fairs, employee fitness program funding, and both weight and stress management programs.
- Conducting audits of workplace processes and systems to identify factors which can contribute to accidents and injuries; and implementing revisions and improvements. Examples include: workplace ergonomic reviews (with improvements to computer work stations and processes involving lifting; and vehicle safety reviews resulting in

the installation of “crash cages” (to contain equipment) in vehicles used for the transportation of equipment).

- Ongoing employee training programs covering all aspects of safe work practices with emphasis on hazard recognition and mitigation.
- Evaluating subcontractor safety performance as an initial screening tool for pre-qualification and selection.

Cultivating an attitude of safety at KEMRON is a dynamic process, founded on the expectation that each employee will fully participate by encouraging safe work practices among coworkers and actively accepting responsibility for his/her own safety and well-being. While the results of our commitment to safety can be measured through independent audits, from external sources such as National Compliance Management Service, and awards received from our customers; the best measure of our success remains our employees: their focus on safety - all day, every day – and the expectation that each will return home healthy and safe at the end of every work day.

2.2 Project Safety Goals

KEMRON’s goal for this project is completion with zero accidents and incidents, including injuries, lost work days, restricted work days, or property damage. KEMRON strives to maintain and/or improve upon their current EMR and safety performance statistics.

SECTION 3 RESPONSIBILITIES AND LINES OF AUTHORITY

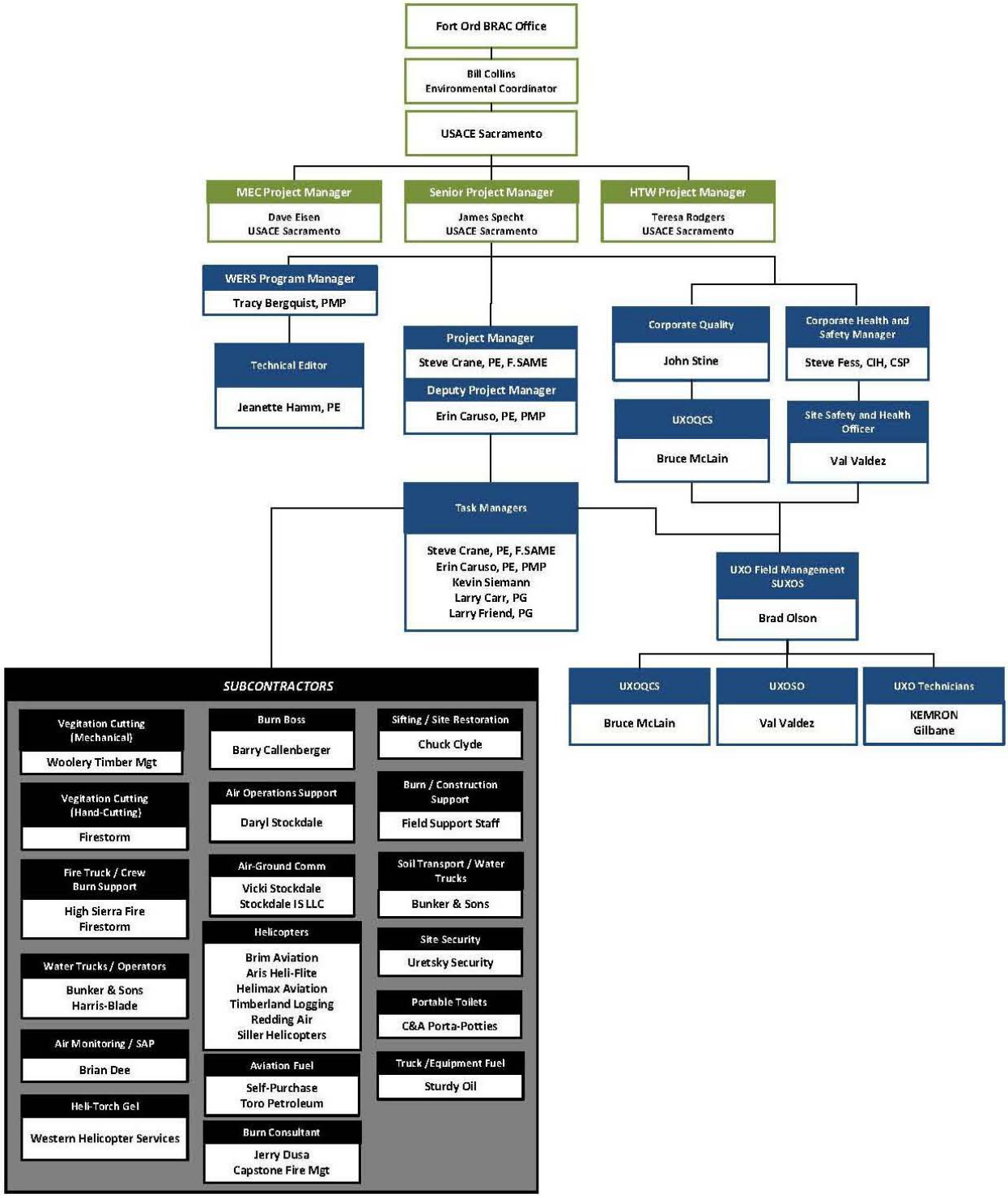
All KEMRON, subcontractor, and site personnel involved in this project will be required to read and understand this document prior to participation in any on-site tasks that involve potential exposure to on-site safety and health hazards. After reading this APP, site personnel will complete the Health and Safety Sign-Off Sheet (Project Specific Safety Orientation Sign-Off Sheet – Page viii), indicating their understanding of, and willingness to comply with, the requirements contained within this APP.

3.1 Management Accountability

KEMRON has the ultimate responsibility for the implementation of the Health and Safety Procedures provided in this APP. KEMRON Corporate Management and associated regional safety officers will conduct regular project performance reviews to ensure health and safety procedures are being followed. All accidents and incidents will be investigated by management and appropriate feedback provided to the Project Manager and Site Safety and Health Officer (SSHO)/ UXO Safety Officer (UXOSO).

3.2 Identification and Accountability of Project Personnel

This section describes the KEMRON and subcontractor personnel position responsibilities for project safety and the lines of authority for these personnel. A detailed organization chart illustrating lines of authority and roles for project management between KEMRON, the Fort Ord Base Realignment and Closure (BRAC) Office, and the USACE is provided in the Project Organizational Chart (provided on the next page).


Fort Ord BRAC Office
Bill Collins
Environmental Coordinator
USACE Sacramento
MEC Project Manager
Dave Eisen
USACE Sacramento
Senior Project Manager
James Specht
USACE Sacramento
HTW Project Manager
Teresa Rodgers
USACE Sacramento
WERS Program Manager
Tracy Bergquist, PMP
Technical Editor
Jeanette Hamm, PE
Project Manager
Steve Crane, PE, F.SAME
Deputy Project Manager
Erin Caruso, PE, PMP
Corporate Quality
John Stine
Corporate Health and Safety Manager
Steve Fess, CIH, CSP
UXOQCS
Bruce McLain
Site Safety and Health Officer
Val Valdez
Task Managers
Steve Crane, PE, F.SAME
Erin Caruso, PE, PMP
Kevin Siemann
Larry Carr, PG
Larry Friend, PG
UXO Field Management SUXOS
Brad Olson
UXOQCS
Bruce McLain
UXOSO
Val Valdez
UXO Technicians
KEMRON
Gilbane
SUBCONTRACTORS
Vegitation Cutting (Mechanical)
Woolery Timber Mgt
Vegitation Cutting (Hand-Cutting)
Firestorm
Fire Truck / Crew Burn Support
High Sierra Fire
Firestorm
Water Trucks / Operators
Bunker & Sons
Harris-Blade
Air Monitoring / SAP
Brian Dee
Heli-Torch Gel
Western Helicopter Services
Burn Boss
Barry Callenberger
Air Operations Support
Daryl Stockdale
Air-Ground Comm
Vicki Stockdale
Stockdale IS LLC
Helicopters
Brim Aviation
Aris Heli-Flite
Helimax Aviation
Timberland Logging
Redding Air
Siller Helicopters
Aviation Fuel
Self-Purchase
Toro Petroleum
Burn Consultant
Jerry Dusa
Capstone Fire Mgt
Sifting / Site Restoration
Chuck Clyde
Burn / Construction Support
Field Support Staff
Soil Transport / Water Trucks
Bunker & Sons
Site Security
Uretsky Security
Portable Toilets
C&A Porta-Potties
Truck /Equipment Fuel
Sturdy Oil

KEMRON project staff will include personnel from various departments within the organization. The following KEMRON and Gilbane employees will have critical roles in the safe execution of this project:

- KEMRON Program Manager: Tracy Bergquist, Project Management Professional (PMP)
- KEMRON Project Manager (PM): Steve Crane, Professional Engineer (PE), Fellow, Society of American Military Engineers (F. SAME)
- KEMRON and Gilbane Task Managers (TMs): Steve Crane, PE, F.SAME; Erin Caruso, PE, PMP; Kevin Siemann; Larry Carr, Professional Geologist (PG); Larry Friend, PG
- KEMRON Corporate Quality Control Manager: John Stine
- KEMRON Corporate Safety and Health Manager (CSHM): Steve Fess, Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP)
- KEMRON Site Safety and Health Officer: Val Valdez (SSHO and UXOSO).
- KEMRON Senior Unexploded Ordnance (UXO) Supervisor (SUXOS): Brad Olson

3.2.1 Project Management (PM)

KEMRON Program Manager: Tracy Bergquist

Tracy Bergquist is responsible for the progress of the work at the program level. She supervises all personnel to ensure appropriate employee performance for site work, health and safety compliance, completing accident/incident reports, and enforcing corrective actions. The program manager, or designee, will have work stoppage authority for the project. In addition, the Program Manager has the following responsibilities:

- Fostering an office-wide commitment to KEMRON's health and safety policy and goals;
- Supports the PM to ensure that safety and health requirements are met;
- Overall contract conformance to Army requirements and specifications, including technical, cost, and schedule;
- Allocation of sufficient resources to ensure successful completion of the project;
- Management of the project budget and schedule, with concurrence from the Army and regulators, thereby, ensuring project requirements are satisfied.

KEMRON Project Manager: Steve Crane, PE, F.SAME.

Mr. Crane is responsible for all day to day activities of the work at the project level and will have overall responsibility for project safety requirements. He supervises all project personnel to

ensure that all on-site work is performed in compliance with the project specifications and maintains direct communication with the Program Manager and the US Army Corp of Engineers Sacramento District (CESPK) Fort Ord Contracting Officer's Representative (COR). The PM will have work stoppage authority for the project. In addition, the PM directs the following:

- Communicating office-specific health and safety needs to the CSHM and SSHO/UXOSO, as appropriate;
- Directing audits of the administration of health and safety programs on job sites;
- Ensures compliance with the SSHP;
- Supports the Task Managers and SSHO/UXOSO to ensure that safety and health requirements are met;
- Reviews and approves the final reports and support files on the project activities;
- Overall responsibility for the success and proper execution of the project;
- Initiation of project planning and implementation of project.
- Management of the project budget and schedule, with concurrence from the Army and regulators, thereby, ensuring project requirements are satisfied.

KEMRON and Gilbane Task Managers: Steve Crane, PE, F.SAME; Erin Caruso, PE, PMP; Kevin Siemann; Larry Carr, PG; Larry Friend, PG

The Task Managers (TMs) are responsible for all day to day activities of the work at the task level. The TMs supervise all project personnel to ensure that all on-site work is performed in compliance with the project specifications and maintains direct communication with the PM. The TMs will have work stoppage authority for their respective projects. The TM, or competent temporary alternative, will directly supervise all on-site project activities and may be onsite during these project activities. In addition, the TM directs the following:

- Prepares and organizes the background review of the project specifications and Work Plans (WPs);
- Organizes the field team to ensure compliance with safety requirements;
- Ensures that project activities are defined and resulting hazards are identified along with control measures;
- Attempts to secure all resources necessary for the safe completion of assigned tasks;
- Obtains permission for the site access and coordinates activities with appropriate officials;
- Ensures compliance with the SSHP;

- Briefs the field teams on their specific assignments;
- Manages field operations;
- Executes the work plan and schedule;
- Enforces safety procedures and supports the SSHO/UXOSO to ensure that health and safety requirements are met;
- Coordinates with the SSHO/UXOSO in determining protection levels and potential upgrades/downgrades;
- Enforces site control;
- Documents field activities;
- Prepares the final reports and support files on the remedial activities;
- Management of all field construction activities, including the direction of project staff and subcontractors in accordance with project requirements;
- Tracking proposed changes to the project;
- Communicating directly with the PM regarding project execution and accountability;
- Coordination with the SSHO/UXOSO and Field Staff to ensure compliance with standard protocols and procedures and implementation of the task orders; and
- Procurement of equipment, material, and supplies.

3.2.2 KEMRON Corporate Support

KEMRON Corporate Quality Control Manager: John Stine

Mr. Stein is responsible for monitoring the progress of the work at the project level. He supervises all personnel to ensure appropriate employee performance for site work, health and safety compliance, completing accident/incident reports, and enforcing corrective actions. Directing audits of the administration of health and safety programs on job sites;

- Ensures compliance with the SSHP;
- Supports the CSHM and SSHO/UXOSO to ensure that safety and health requirements are met;
- Reviews and approves the final reports and support files on the project activities;
- Overall contract conformance to project requirements and specifications, including technical, cost, and schedule;
- Initiation of project planning and implementation of project.

KEMRON Corporate Safety and Health Manager: Steve Fess, CIH, CSP

The CSHM is responsible for the development and administration of KEMRON's Corporate Environmental, Health and Safety Program. The CSHM will act as the Safety and Health Manager for this project by providing continuous consultation with the PM, SUXOS, and UXOSO to maintain the proper implementation of the APP. The CSHM reports directly to the Executive Vice President for all health and safety issues. The CSHM is responsible for managing the SSHO/UXOSO and the development, oversight, and enforcement of the APP/SSHP. Corporate health and safety representatives may conduct site audits and inspections, but will not be on site during all project activities. Responsibilities of the CSHM include the following:

- Fostering a company-wide commitment to KEMRON's health and safety policy and goals;
- Develops and maintains health and safety standard operating procedures and policies;
- Reviews all accident/incident reports, and initiates additional investigation when necessary; and
- Obtains authorization to fund health and safety training and equipment.
- Provide safety and health support the project at the startup of the project, for major phases of work, and for task specific situations requiring additional oversight;
- Conduct, supervises, or directs periodic inspections/audits to determine if the APP is being followed;
- Supports the PM, TM, and SSHO/UXOSO during emergencies;
- Coordinates any modifications to the APP/SSHP with the SSHO/UXOSO and PM;
- Determines the appropriate Personal Protective Equipment (PPE) levels for each task, and works with SSHO on identifying appropriate downgrade/upgrade situations;
- Reviews and evaluates the air monitoring data and make decisions concerning engineering controls, work practices, and levels of PPE;
- Reviews the daily Quality Control (QC) reports and any accident/incident/near miss reports; and
- Serves as a member of the Contractor's quality control staff.

3.2.3 Field Team

KEMRON Site Safety and Health Officer and UXO Safety Officer: Val Valdez (SSHO and UXOSO):

The SSHO/UXOSO is responsible for managing, implementing, and enforcing this APP. The SSHO/UXOSO will report site-specific safety issues and concerns to the PM, TM, and CSHM. The SSHO/UXOSO will be onsite at all times during project activities. He will be responsible for insuring implementation of and daily compliance with the SSHP, including such issues as PPE, training, policy enforcement, health monitoring, and report preparation, among others. The SSHO/UXOSO is responsible for conducting the daily tailgate safety meetings as well as establishing the decontamination procedures, equipment and supplies. As UXOSO, he will evaluate health and safety concerns with respect to military munitions. He will provide information and help to develop specific guidance to ensure safe work practices on military munitions sites. Specific responsibilities include:

- Ensures that all personnel conduct project activities in accordance with the SSHP, and initiates disciplinary action for safety violations, in conjunction with PM and CSHM, as necessary;
- Informs KEMRON and subcontractor personnel of KEMRON health and safety policies and their application to potential hazards associated with specific site operations;
- Corrects work practices or conditions which may result in injury or exposure to toxic substances;
- Completes accident, injury, and illness investigation reports and notifies line management of all job-related illnesses or injuries;
- Coordinates on-site emergency response activities;
- Monitors all personnel performance for compliance with safe work practices, including the SSHP;
- Advises the CSHM of deviations from safe work practices and of methods to correct the problem;
- Continually evaluates environmental conditions: weather, chemical, physical, etc. and recommends necessary modifications, to the PM and CSHM, to ensure personnel safety;
- Conducts safety training and daily safety meetings;
- Ensures that all documentation necessary for health and safety programs is generated and maintained;
- May stop any activity on site and/or the entire operation when conditions immediately dangers to life and health are identified;

- Ensures protective clothing used is consistent with the requirements of the SSHP;
- Periodically inspects protective clothing and equipment;
- Ensures that PPE are properly stored and maintained;
- Controls entry and exit at the Access Control Points;
- Coordinates safety and health program activities with on-site essential personnel;
- Confirms each team member's suitability for work based on a physician's recommendations;
- Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue;
- Enforces the "buddy" system;
- Setting up decontamination lines and the decontamination solutions appropriate for the type of chemical contamination on site;
- Controls the decontamination of all equipment, personnel, and samples from the contaminated areas;
- Assists in the disposal of contaminated clothing and materials;
- Ensures that all required equipment is available. Advises medical personnel of potential exposures and consequences;
- Is aware of emergency procedures, evacuation routes, and the telephone numbers of the plant emergency services, ambulance service, local hospital, poison control center, fire department, and police department;
- Notifies, when necessary, local public emergency officials;
- Coordinates emergency medical care; and
- Ensures all site visitors have the appropriate training and clearances and maintains on site personnel training records, and medical clearances and respirator fit test documentation for any respirator users.

KEMRON Senior UXO Supervisor (SUXOS): Brad Olson

The SUXOS will be responsible for overseeing and implementing MEC remedial operations and MEC avoidance operations. The SUXOS has the following responsibilities:

- Assist in the development of site-specific work plans;
- Evaluate the sites to determine the level of support that is required to safely conduct the given operation;

- Oversee UXO personnel that provide explosive ordnance recognition, escort, location, and safety functions during anomaly avoidance activities;
- Make arrangements through the USACE for military munitions removal or disposal actions in the event that the work area is too contaminated with MEC/ MPPEH to safely allow non-UXO personnel to work in the area;
- Ensure that exact location of any military munitions related items encountered are accurately captured, with the aid of a digital global positioning system, and that those coordinates are properly reported and recorded in the geographical information system;
- Ensure that suspect MRSs are clearly marked or delineated prior to Hazardous and Toxic Waste (HTW) crews entering the area;
- Ensure that MEC safety briefings are given to all site personnel and visitors; and
- Take operational control of a site until properly relieved, in the event hazardous MEC/MPPEH is encountered.

Field Support Team

Depending on the size of the field team, any or all of the field team may be in the Work Party, but the Work Party should consist of at least two people. The field team members may consist of equipment operators, UXO technicians, environmental technicians, etc. The field team has the following specific responsibilities:

- Safely completes the on-site tasks required to fulfill the work plan.
- Complies with the SSHP.
- Notifies PM or SSHO/UXOSO of any unsafe work-place conditions or reportable safety incidents/accidents.

3.3 Requirement for Competent Person Oversight

KEMRON shall provide competent person oversight over all applicable project work, and all work shall be performed under the direction of the competent person as required. Where an OSHA standard specifically requiring a competent person applies, a competent person will provide direction when necessary for all work performed on the job site.

The KEMRON employee who has earned certification by the American Board of Industrial Hygiene (ABIH) and the Board of Certified Safety Professionals (BCSP) is included below. The CIH / CSP will serve in a corporate oversight capacity and will provide assistance to the SSHO/UXOSO as CSHM. Certifications for this employee are kept on site.

- Steven K. Fess, CIH [ABIH Reg. #5926 CP] CSP [BCSP Reg.# 9151 CP] (CP – Comprehensive Practice)

The OSHA 30-hour Construction Outreach course covers the requirements of 29 CFR Part 1926 along with the OSHA recordkeeping requirements of 29 CFR Part 1904. All project work will be supervised by safety personnel who have completed this training. The OSHA 30-hr training completed by KEMRON personnel includes at a minimum the following topics:

- OSHA Act/General Duties Clauses;
- 29 CFR 1904, Recordkeeping;
- 29 CFR Part 1926 Subpart C: General Safety and Health Provisions, Competent Person;
- 29 CFR Part 1926 Subpart D: Occupational Health and Environmental Controls;
- 29 CFR Part 1926 Subpart E: PPE, types and requirements for use;
- 29 CFR Part 1926 Subpart F: Understanding fire protection in the workplace;
- 29 CFR Part 1926 Subpart K: Electrical;
- 29 CFR Part 1926 Subpart M: Fall Protection; and
- A review of other Subparts under 29 CFR Part 1926 that may be utilized on KEMRON jobsites such as - but not limited to - rigging, welding and cutting, scaffolding, excavations, demolition, materials handling and disposal, etc.

In the event that specialized training, such as an excavation greater than four ft. in depth, becomes necessary for project tasks, a qualified or competent person will be assigned to oversee those duties. Any tasks that require OSHA competent person training will be determined as the scope of work is later defined and approved. KEMRON maintains a large pool of competent persons as defined 29 CFR 1926. The names of the competent or qualified person(s) are provided below with documentation of competency/qualification to meet the OSHA specification(s) kept on site. The OSHA 30-hr training completed by KEMRON personnel includes the following personnel:

- Steven K. Fess, CIH/CSP6/21/2007

Where an OSHA specific competency or qualification standard is applicable, no work shall be performed by KEMRON unless a designated competent/qualified person is on the job site.

3.4 Pre-Task Medical Evaluations and Safety and Health Analysis

In advance of any site activity, the anticipated procedures and duties will be reviewed for health hazards. No work will be started prior to a pre-task safety and health analysis. All KEMRON employees are evaluated by a Licensed Health Care Professional or physician certified in Occupational Medicine through Marietta Occupational Health, Inc. Annual medical examinations of each employee are conducted to determine medical surveillance protocols and review examination and test results. The medical examination and surveillance is performed in compliance with 29 CFR 1910.120 (f) and 29 CFR 1926.65 (f). To properly conduct the

examinations, Marietta Occupational Health personnel are provided with information pertaining to the employee's typical duties and potential exposures: hazards, types of PPE used, information from previous exams, and the guidance documents for the medical surveillance program (29 CFR 1910.120 & 134 and National Institute for Occupational Safety and Health (NIOSH) 85-115).

Annual medical examinations shall be conducted for all employees, with these exceptions: if personnel develop symptoms indicating an exposure, based on a specific schedule determined by the physician, or upon termination or job reassignment. Each medical exam shall consist of an individual's baseline health status and exposure history, susceptibility to hazardous materials or substances, ability to wear and function in PPE, and overall fitness and ability to perform assigned duties.

Based on the results of the medical evaluation, the physician or their designee will provide a written opinion for each employee. The report will be submitted to the CSHM. The physician's opinion will include the verification of the employee's fitness to perform his/her assigned duties and recommendations for individual limitations, the physician's opinion about the risk of exposure for employees, and a statement that the employee has been informed and advised about the results of the exam. Copies of the medical surveillance records must be provided by all on-site project employees prior to site entry. Copies of available records are provided in Appendix C.

The analysis includes evaluating the potential hazards and the risks associated with those hazards. Protective measures are then incorporated into the scope and applicable work plans (i.e., APP and associated WPs). Each worker will be able to record identified hazards (either anonymously or by recording their name) on a daily check sheet to ensure that employees remain engaged in evaluating their work area and activities. The observations are then assessed by the PM, TM, and/or SSHO/UXOSO to determine appropriate actions to address the concerns identified.

3.5 Non-Compliance Safety Requirements

All employees working on the project are expected to comply with the safety and health requirements described in this APP and the SSHP. All employees and site visitors shall be informed of and comply with the rules and regulations of the APP. In the event that an employee does not comply with the safety and health requirements the PM, TM, and/or SSHO/UXOSO will meet with the employee, clearly define the deficiency to the employee, the impact of the deficiency and discuss the corrective actions that will be taken to correct the issue - and the timeline for the action.

All deficiencies and corrective actions will be recorded in the project record by the TM and/or SSHO/UXOSO. The TM and/or SSHO/UXOSO will follow-up within a designated timeframe to determine if the deficiency has been addressed. If the employee fails to correct the deficiency,

disciplinary action(s) will be taken ranging from written reprimand through termination of the employee.

In the event an unsafe condition is identified, all employees are empowered to take corrective action to immediately rectify the condition. If the unsafe condition continues to exist, the PM and SSHO/UXOSO will be notified. All personnel working on site are expected to participate in this hazard notification process. Once the issue has been noted, the TM and SSHO/UXOSO will conduct an investigation to evaluate the deficiency and correct it. The findings and corrective actions will be noted on a KEMRON Accident/Incident Report form which shall be submitted to project management, including the PM and CSHM for review.

SECTION 4 SUBCONTRACTORS AND SUPPLIERS

KEMRON will conduct a majority of the project work but also anticipates using subcontractors during this project. Currently, all subcontractors that will be utilized during the entirety of the former Fort Ord project have not yet been identified. A list of potential subcontractors for the project may include but is not limited to:

- Site work and Project Management: Gilbane
- Vegetation Cutting: Woolery Timber Management, Firestorm
- Fire Truck / Crew Burn Support: High Sierra Fire, Firestorm
- Water Trucks / Operators: Bunker & Sons, Harris-Blade
- Air Monitoring: Gilbane
- Heli-Torch Gel: Western Helicopter Services
- Burn Boss: Wildland Rx
- Air Operations Support: Stockdale IS LLC
- Helicopters: Brim Aviation, Aris Heli-Flite, Helimax Aviation, Timberland Logging, Redding Air, Siller Helicopters
- Aviation Fuel: Toro Petroleum
- Burn Consultant: Capstone Fire Management
- Soil Transport / Water Trucks: Bunker & Sons
- Site Security: Uretsky Security
- Portable Toilets: C&A Porta-Potties
- Truck / Equipment Fuel: Sturdy Oil

Records of Subcontractors will be updated as new subcontractors are approved to work at the former Fort Ord project site.

All subcontractors, visitors, and other site personnel must check in with the SSHO/UXOSO to verify that all appropriate entry requirements are met. Each subcontractor and visitor must enter their name, time on and off site, and dates on-site in the sign-in log. All visitors will be briefed on the potential hazards and safety requirements. The TM and/or SSHO/UXOSO will monitor subcontractor operations to ensure compliance with site safety requirements. The SSHO/UXOSO will consult with KEMRON's CSHM if questions arise. A supply of required PPE shall be maintained on-site at all times for use by visitors.

Subcontractors will be responsible for the safety and health of their employees and to ensure compliance with the requirements of this APP. Subcontractors must also adhere to the following requirements:

- Subcontractors shall submit all applicable training documents to KEMRON prior to mobilization;
- Subcontractors must adhere to all applicable site safety requirements set forth in this APP. This will involve consideration of the nature, location, and duration of their work tasks;
- Subcontractors will be responsible for reviewing their assigned tasks for potential hazards and appropriately protecting their employees from potential hazards. In some cases subcontractors will be required to submit task specific safety plans to the SSHO/UXOSO prior to starting work;
- Subcontractors must attend daily safety meetings/briefings on anticipated hazards and safety requirements designed to mitigate those risks;
- All subcontractors will participate in all scheduled health and safety meetings and training sessions;
- All subcontractors will be responsible for their work activities and be available to participate in routine safety and health audits and site inspections; and
- All unsafe conditions, behaviors, equipment damage, injury events and problems identified will be reported by the subcontractor to the SSHO/UXOSO or TM.

SECTION 5 TRAINING

All KEMRON employees, subcontractors' employees and site visitors must be trained in accordance with this APP. All new KEMRON employees will attend a safety and health orientation training session prior to work assignment. For all tasks, appropriate training will include briefings by the SSHO/UXOSO on site hazards and work rules. In addition, the SSHO/UXOSO will require evidence of prior completion of mandatory training as applicable to the specific employee duties. The SSHO/UXOSO will maintain a file of training certificates or other documentation verifying that the applicable requirements have been met.

5.1 General Training

KEMRON's employee orientation training includes an initial 40-hour HAZWOPER course and medical examination by a licensed physician or their designee. A summary of KEMRON training topics, content, and frequency of training is summarized in the table below.

Table 5-1 General Training Table

TOPIC	SUMMARY	INITIAL SCHEDULE	FREQUENCY
Corporate EH&S Manual	Review entire contents of manual	Within 90 days of hire	Initial with annual refresher and at each revision
HAZWOPER	Review requirements of 29 CFR 1910.120(e)(8)	Prior to assignment on HAZWOPER site	Initial and annual refresher
HAZWOPER Supervisor	Review requirements of 29 CFR 1910.120(e)(4)	Prior to assignment as HAZWOPER supervisor	One time initial
Medical Surveillance Certification	Must meet requirements of 29 CFR Part 1910	Prior to assignment on HAZWOPER site	Initial and annual reevaluation
Drug Free Work Place (DFWP) and Substance Detection	Program requirements and testing protocols	Within 6 weeks of hire	At hire and annually thereafter
Respiratory Protection	Selection, use, care maintenance, limitations	At time of assignment of respirator	Initial and annual refresher
Fit testing	Procedure per Section 17 of Corporate Environmental Health and Safety (EH&S) Manual	At time of assignment of respirator	Initial and annual refitting; every 6 months for asbestos employees or evidence of significant change in shape of the employee's face

TOPIC	SUMMARY	INITIAL SCHEDULE	FREQUENCY
PPE	Selection, use and maintenance	At time of assignment of PPE	Initial and annual refresher
Hazard Communication	Labeling; Safety Data Sheets (SDS) overview; Hazardous materials identification; exposure hazards	Within 90 days of hire	Annual refresher and whenever new materials or new SDSs are introduced
Lockout/Tagout (LOTO)	Awareness and recognition for all affected and other employees "Authorized Employees" require additional training	At time of assignment of work involving LOTO Prior to work assignment	Initial and annual refresher Initial and annual refresher
Trenching/Excavation	Overhead/underground utility hazards, elevated work/fall protection, Comprehensive Site Evaluation as it applies to excavation, sloping/shoring requirements, and other topics as defined in the EH&S manual	Awareness level within 90 days of hire Competent person training where specifically required by work assignment	Initial and annual refresher Initial
Fire Protection	Hazard recognition; extinguisher location and use; emergency notification and evacuation procedures; PPE requirements	Within 90 days of hire	Initial and annual refresher
Electrical Safety	Awareness level for all employees - Hazards, powered hand tools and use of Ground Fault Circuit Interrupters "Qualified" employees – LOTO for electrical applications and as specified by OSHA	Awareness level within 90 days of hire Prior to assignment	Initial and annual refresher Initial and annual refresher
Confined Space	Awareness level for all employees	Awareness level within 90 days of hire	Initial and annual refresher

TOPIC	SUMMARY	INITIAL SCHEDULE	FREQUENCY
	Entrant, attendant, entry supervisor, rescue team require additional training	Prior to assignment	Initial and annual refresher
First Aid/ Cardiopulmonary Resuscitation (CPR)	For employees providing first aid at HAZWOPER sites	Prior to assignment	CPR – Annual First Aid – Every 3 years
Hearing Conservation	Noise effects on hearing; purpose of hearing protection; types, selection, fitting, use, maintenance and care of hearing protectors; purpose and explanation of audiometric testing	Prior to assignment involving exposure at or above 85 decimals 8-hr time weighted average	Initial and annual refresher
Bloodborne Pathogens	Requirements of OSHA standard; KEMRON's Control Plan; hazard recognition; controls, work practices & PPE; hepatitis B vaccine; appropriate response actions; signs/labels	Within 90 days of hire	Initial and annual refresher
Elevated Work - Fall Protection	Awareness level for all employees - what triggers the need for fall protection; recognition of elevated work and fall hazards	Within 90 days of hire	Initial and annual refresher
	Employees using fall protection devices - inspection and use	Prior to assignment	Initial and annual refresher
Portable Power Tools	Specific to the tool to be used; instruction in all tools being used	Prior to assignment	Initial and annual refresher
Powered Industrial Trucks	Employees driving fork trucks; must be independently certified; pass course which meets OSHA requirements; and includes operational testing	Prior to assignment	Every 3 years or if operator is observed driving unsafely; is involved in accident or near miss; has received an unsafe evaluation; is assigned to different equipment; or workplace conditions change
Ladder Safety	Awareness level for all employees-ladder inspection	Prior to assignment involving use of	Initial and annual

TOPIC	SUMMARY	INITIAL SCHEDULE	FREQUENCY
	and use; ladder selection; safety protocol	ladders	refresher
Hazardous Materials Transportation	Employees who prepare or offer for shipment, Department of Transportation (DOT) hazardous materials by any mode	Prior to assignment involving shipment of hazardous materials	Initial and annual refresher
International Air Transport Association Dangerous Goods by Air Shipping	Employees who prepare or offer dangerous goods for shipment by air	Prior to assignment involving shipment of dangerous goods by air	Initial and refresher every 24 months
Chemical Specific Hazards	Employees whose work includes potential exposure to chemicals subject to specific OSHA standards (e.g. Toxic metals, asbestos, benzene, etc.)	Prior to assignment involving potential exposure to substances regulated by OSHA chemical specific standards (29 CFR 1910)	Minimum initial and annual refresher, or as otherwise required by the specific standard
Project Health and Safety Planning	All employees on project site – entire contents of plan	At project initiation	When plan is modified

5.2 Site Safety Training and Meetings

All KEMRON employees, subcontractors' employees, and site visitors shall be provided ongoing safety training as appropriate to enable them to perform project tasks in a safe manner.

5.2.1 Daily Safety Meetings

The SSHO/UXOSO shall conduct daily meetings at the start of each shift for all KEMRON employees, subcontractors, and site visitors. The meetings are intended to ensure that all project personnel understand site conditions and operating procedures, that PPE is being used correctly and to address worker health and safety concerns. All new amendments to the SSHP will also be reviewed at these meetings. Any issues identified during the active operations will be discussed and resolved. Meeting attendance shall be recorded on the sign-in sheet and maintained in the project file. These meetings shall incorporate safety and health topics for the day's activities and may include:

- Daily Scope of Work;
- Overview of AHA's;
- PPE; and Safe Work Practices

The anticipated hazards and the specific tasks expected under the scope of work are summarized in the AHA Forms in the SSHP, Appendix A to this APP. These forms ensure compliance with the revised OSHA standard 29 CFR 1910.132, which requires assessment of tasks and operational hazards where PPE is required to protect personnel. Each form contains task-specific information related to hazard control and mitigation, including: specific engineering control measures if applicable; standard operating procedures; equipment requirements; specialized training requirements and PPE requirements.

5.2.2 Supervisor's Safety Meetings

The PM, TM, and SSHO/UXOSO will conduct periodic Supervisor's Safety meetings with designated workers as deemed appropriate due to tasks which may require additional safety training, or for modified AHA's. The Supervisor's Safety Meetings will be held prior to operations where additional hazardous are present and were not formerly addressed by AHA's.

5.3 Mandatory Training and Certifications

Mandatory training and certifications have been identified for the expected tasks under this contract. The TM or SSHO/UXOSO will verify that the following training courses have been completed by the personnel indicated:

- **Forty-hour (40-hour) course on health and safety in HAZWOPER.** Evidence of training as a site worker in accordance to 29 CFR 1910.120 is required for site workers and visitors potentially exposed to chemical, radiological, or ordnance hazards. Evidence of a recent annual refresher course also is required.
- **Eight-hour (8-hour) course on supervision of hazardous waste operations.** Evidence of training as a supervisor in accordance with 29 CFR 1910.120 is required for KEMRON supervisory and management personnel.
- **Thirty-hour (30-hour) OSHA Construction Outreach class.** The SSHO/UXOSO, as a minimum, must show evidence of this training or an equivalent, 30 hours of formal construction safety and health training covering the required subjects of the OSHA 30-hour.
- **OSHA 1926 Subpart P, Excavation Safety.** Any personnel supervising excavation and trenching work shall have competent person training as required by OSHA CFR 1926 Subpart P.
- **First Aid / CPR.** Evidence of current certification in first aid / CPR will be required for a sufficient number of KEMRON employees or onsite personnel to permit scheduling of at least two (2) personnel with this training on the project site at all times. Procedures to manage Bloodborne Pathogens should be a component of this training.

- **Respirator training.** The need for project specific training in the use of respirators is not anticipated. General respirator use and annual fit testing is conducted for all KEMRON employees. The PM/SSHO/UXOSO will require that anyone who uses a respirator provide evidence of a physician's fitness statement appropriate training and fit testing per 29 CFR 1910.120.
- **Hazard Communication (HAZCOM).** Hazard Communication training is required for all KEMRON employees. Project specific HAZCOM training will be provided to all site workers.
- **Lead Awareness.** Evidence of Lead Awareness training shall be a requirement for all on-site KEMRON employees, subcontractors, and site visitors where lead exposure may occur.

Military Munitions Response Program (MMRP) Specific Training

- **UXO Technical Training:** UXO personnel must be a graduate of an approved Explosive Ordnance Disposal (EOD) training program (documentation of this training is maintained by the KEMRON Human Resources Office) including:
- U.S. Naval Explosive Ordnance Disposal School, Eglin Air Force Base, Florida;
- U.S. Army Bomb Disposal School, Aberdeen, Maryland;
- EOD Assistant Course, Redstone Arsenal, Alabama or
- Department of Defense certified equivalent.
- **Explosives Safety Training:** The Demolition Supervisor is certified by the Bureau of Alcohol, Tobacco, Firearms, and Explosives in accordance with ATF P 5400.7 Employee Possessor Certification. An active state blaster, license/permit will fulfill the training requirement.
- **Site Supervisor Training SUXOS/UXOSO:** The SUXOS and the UXOSO will complete the OSHA 1910.120, Hazardous Waste Site Supervisors 8-hour Course.
- **Operational Specific Training Certifications and Records:** The UXOSO maintains current records of site training and verifies the training status of all on-site personnel. Records are kept to ensure identified personnel receive appropriate initial health and safety training, annual refresher courses and proof of medical clearance. Mandatory records for initial OSHA 1910.120 and 8 hour annual refresher training, EOD qualification certificates and any licenses or certificates associated with the use of explosives will be maintained on site for regulator and client review. Response action contractors and visitors also provide the UXOSO evidence of Health and Safety training before site entry is authorized.

In addition, the TM and/or SSHO/UXOSO will determine whether new employees have previous experience on a hazardous waste or ordnance site. They will arrange for close supervision of

inexperienced workers by an experienced supervisor for at least their first three (3) days of work on the site.

A detailed presentation on site risks and the workplace site safety and health-and-safety program will be conducted by the TM or SSHO/UXOSO before work commences on the site, and at other times when new site workers arrive. Topics will include the following:

- Requirements and responsibilities for maintaining a safe work environment;
- General safety and health policy and procedures;
- Employee and supervisor responsibilities for reporting all accidents/ incidents;
- Emergency-response plans and procedures for obtaining medical treatment;
- Procedures for reporting and correcting unsafe conditions or practices;
- Specific job hazards and the means to mitigate the risks;
- Names of and contact information for those responsible for safety program administration;
- Site hazards, hazard recognition, and symptoms of excessive exposures;
- Proper use of required personal protective equipment; and
- Safe use of engineering controls and equipment on the project site.

In addition, the SSHO/UXOSO will provide detailed safety training in the following areas to workers exposed to the chemical hazard described:

Chemical Hazard Communication. If chemicals are brought onto the job site, employees potentially exposed to their hazards will receive appropriate safety training. This will include the details of the chemical hazard communication program described in the accompanying SSHP.

The SSHO/UXOSO will confer with KEMRON's CSHM to determine an appropriate schedule for retraining employees on site-specific safety topics. Annual or more frequent refresher sessions will be required.

5.4 Periodic Safety and Health Training

Refresher training will be provided as required:

- 8-hour HAZWOPER Annual Refresher training per 29 CFR 1910.120(e) will be conducted annually. All project staff will receive training to maintain their 40-hour General Site Worker certification.
- First aid training will be renewed every 3 years and CPR training, either Red Cross, National Safety Council, or the American Heart Association will be updated every 1-2 years, respectively, by all project staff.

- Hazard Communication training will be refreshed annually by all project staff.
- Respiratory Protection/ Respirator Fit Testing will be refreshed annually by all project staff.
- At the beginning of the project and whenever needed all new project staff will receive site orientation training.
- If conditions change that necessitate compliance with additional OSHA or project specific requirements, and then required training will be provided to address any new issues.

5.5 Emergency Response Training

Employees will be trained for emergency response situations or conditions as detailed in Section 8.

SECTION 6 SAFETY AND HEALTH INSPECTIONS

6.1 Inspection Responsibilities

A minimum of one daily jobsite safety and health inspection will be conducted by the SSHO/UXOSO to verify that site operations and personnel are complying with this APP and the accompanying SSHP. Safety and health inspections for activities which require a competent person under OSHA will be performed by the competent person on site. The results of these inspections will be recorded in the safety log and reported to the TM. Any deficiencies will be noted and corrective action will be assigned and recorded. The safety logs shall be provided with the daily QC reports. Each safety log shall include the date, project area, special safety and health topics, and signature.

The TM will direct that any violation of the site safety program be corrected immediately, and he will stop work if any condition places employees at unacceptable risk. He will confer with the CSHM and/or Corporate CIH if unsafe conditions cannot be corrected promptly, or if violations to project safety requirements occur repeatedly.

The UXOSO will initially establish an inspection schedule that will efficiently cover the inspection requirements for UXO operations, as outlined in the Table below. The UXOSO will be responsible for conducting the required inspections as outlined in Table with the support of the UXO Quality Control Officer. The results of these inspections will be recorded and reported to the PM. All inspections will be documented in the safety log.

Table 6-1 UXO Operations Inspections Table

DESCRIPTION	TYPE	FREQUENCY
Location Surveying and Mapping	Visual Observation	Daily
Surface/Subsurface Clearance	Visual Observation	Daily
Anomaly Investigation/Excavation	Visual Observation	Twice Daily
Transportation of Explosives	Visual Observation	Daily
UXO Disposition	Visual Observation	Daily
Inert UXO and Related Scrap Turn-In	Visual Observation	Daily
Personal Protection	Visual Observation	Daily
Work Practices	Visual Observation	Daily
Site Control	Visual Observation	Daily
Emergency Response/First Aid Equipment	Visual Observation	Weekly

6.2 External Inspections

KEMRON does not anticipate external inspections of the jobsite. However, if representatives of government agencies or other affected parties wish to inspect the project area or review activities, the inspection will be discussed with the external party and accommodated on an as needed basis.

SECTION 7 ACCIDENT REPORTING

7.1 Exposure Data

The exposure data (man-hours worked) will be provided to the PM or TM by the SSHO/UXOSO or his/her designee at regular intervals. The PM will prepare any required reports and the information will be provided to other parties as requested on an as needed basis.

This information will be used in calculating the KEMRON OSHA recordable incident rates for the calendar year.

7.2 Accident Investigations, Reports, and Logs

The KEMRON PM, TM, and SSHO/UXOSO shall be notified immediately if worker exposures, accidents, or site conditions not anticipated in this document are encountered. Within 24-hours of an accident or incident, the SSHO/UXOSO will notify KEMRON's CSHM. Accidents will be investigated to identify root cause(s) and establish corrective measures to prevent recurrence. In the event of a significant near-miss event or an incident for which a report to the CESPK Fort Ord COR is not required, the SSHO/UXOSO will investigate the incident and report the results of the investigation using the appropriate KEMRON Accident/Incident Report form. The KEMRON Accident/Incident Report form will be completed by the SSHO/UXOSO and/or affected employee and forwarded within twenty-four (24) hours to the CSHM and PM. Notification of any accidents or incidents reportable under OSHA will be reported to the CESPK Fort Ord COR immediately.

The TM and/or SSHO/UXOSO will investigate every accident, injury, or near-miss event, and prepare a formal report of the incident for review by the manager of health and safety. The formal report shall include the following information:

- Date of incident
- Names of employees involved in incident
- Description of incident
- Root Cause(s)
- Corrective Action determination
- Date of Corrective Action implementation
- Verification of Corrective Action

All accidents including near misses must be reported to USACE Contracting Officer or Government Designated Authority within 24 hours. Additionally an ENG Form 3394 must be submitted when a contractor accident occurs.

Ensure a courtesy copy is mailed to:

USACE
ATTN: CESPK-SO (Room 960)
1325 J. Street
Sacramento, CA 95814

After formal reports are issued, the SSHO/UXOSO will conduct follow-up inspections to validate that the corrective actions have been implemented and that these actions are effective in preventing recurrences. Follow-up activities may include but are not limited to the following:

- Conducting and evaluating the effectiveness of retraining;
- Conducting periodic inspections of the task where deficiencies were noted to ensure proper work techniques are now implemented; and
- Reviewing safe work procedures during daily tailgate meetings to promote awareness of deficiencies.

Daily records of first-aid treatment provided to KEMRON employees will be maintained by the SSHO/UXOSO in the safety log. All near misses and first aid as well as accidents and incidents are reportable to KEMRON management in accordance with KEMRON policy. The SSHO/UXOSO will investigate every accident, injury, or near-miss event, and prepare a formal report of the incident for review by the manager of health and safety. The formal report shall include the following information:

- Name and title of the person reporting.
- Date of incident
- Description of incident
- Summary
- Cause
- Damages
- Names of employees involved in incident
- Corrective Action determination
- Date of Corrective Action implementation
- Verification of Corrective Action

Accident/Incident Reports to the CESPK Fort Ord COR will be completed as soon as possible, but not more than twenty-four (24) hours after the event. KEMRON shall investigate the incident and submit the finding and corrective actions within five (5) working days of the incident. Corrective actions will be implemented as soon as reasonably possible.

Immediate notification of incidents will be required when there is:

- A Fatal injury;
- Permanent total or partial disability;
- Hospitalization of one (1) or more person resulting from a single incident; or
- Property damage exceeding $200,000 or more.
- Arc Flash Incident/Accident
- USACE aircraft destroyed or missing

If required, an OSHA Form 301 will be completed by the KEMRON CSHM in consultation with the SSHO/UXOSO and TM.

Effective January 1st, 2015, employers are required to report the following events to OSHA:

- All work-related fatalities.
- All work-related in-patient hospitalizations of one or more employees.
- All work-related amputations.
- All work-related losses of an eye.

Employers must report work-related fatalities within 8 hours of becoming aware of the fatality. For any in-patient hospitalization, amputation, or eye loss, employers must report the incident within 24 hours of becoming aware of the incident.

Only fatalities occurring within 30 days of the work-related incident must be reported to OSHA. Further, for an inpatient hospitalization, amputation or loss of an eye, then incidents must be reported to OSHA only if they occur within 24 hours of the work-related incident. However, the fatality, in-patient hospitalization, or loss of an eye must be included on the OSHA injury and illness record if the employer is required to keep such records.

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SECTION 8 MEDICAL SUPPORT CONTACT INFORMATION

In the event of an incident or medical emergency, the following contact information is provided to initiate and emergency response.

Table 8-1 Emergency Response

National Support Services		**Phone Number**
CHEMTREC	Operator	800-424-9300
National Response Center	Operator	800-424-8802
National Poison Control Center	Operator	800-362-9922
Federal Emergency Management Agency	Operator	202-646-2400
Centers for Disease Control (CDC)	Operator	800-232-4636
Local Emergency Service		**Phone Number**
Santa Clara Valley Medical Center Trauma/ Burn Facilities	Operator	(408) 855-5000 then press 0 for 24-hr operator (408) 885-6900 for Emergency Room
Community Hospital of the Monterey Peninsula	Emergency Department	(831) 625-4900
Doctors on Duty – Occupational Medical Facility (Marina Location)	Operator	(831) 883-3330
Cal-Star Air MedEvac (Emergency MedEvac)	Dispatch	(800) 252-5050
Presidio of Monterey Fire Department	Emergency Line	(831) 242-7700
Presidio of Monterey Police Department	Dispatch	(831) 242-7851
Other Agencies	**Contact**	**Phone Number**
US Army Garrison Presidio of Monterey Safety Office	Al Morrissey, Safety and Occupational Health Manager	(831) 242-6507
Fort Ord BRAC Office Base Environmental Coordinator	Bill Collins	(831) 242-7920
Fort Ord BRAC Office MMRP PM	Lyle Shurtleff	(831) 242-7919
BLM, Former Fort Ord	Eric Morgan	(831) 394-8314
Fort Ord BRAC Office Community Relations	Melissa Broadston	(831) 393-1284
Monterey Airport Tower	24 Hour line	(831) 375-3419
Presidio of Monterey Fire Dept. Non-Emergency	Operator	(831) 242-7702
USACE Ordnance and Explosives (OE) Safety Specialist	Shawn Meek	(916) 213-9563
CESPK Fort Ord COR	James Specht	(916) 557-7906

CESPK Fort Ord Project Manager	David Eisen	(831) 393-9692
Other Agencies	**Contact**	**Phone Number**
CESPK Fort Ord Project Manager (HTW)	Teresa Rodgers	(916) 557-6624
Vandenberg Air Force EOD	Command Post Duty Personnel	(805) 606-9961
Project Personnel	**Contact**	**Phone Number**
Project Manager	Steve Crane	(916) 792-5327
Deputy Project Manager	Erin Caruso	(925) 595-2337
SSHO/UXOSO	Val Valdez	(831) 869-2030
SUXOS	Brad Olson	(831) 869-0789

Hospitals:

Santa Clara Valley Medical Center/Trauma Center
750 S Bascom Ave, San Jose, CA 95128
Main Phone: (408) 885-5000
Emergency: (408) 885-6900

Community Hospital of the Monterey Peninsula
23625 Pacific Grove-Carmel Hwy, Monterey, CA 93942
Phone: (831) 625-4900

Primary Occupational Medical Provider (Alternative Locations are in Section 10.6):
Doctors on Duty
3130 Del Monte Blvd. Marina, CA 93933
Phone: 831-883-3330

8.1 On-site Medical Support

The following will be provided at each job site:

- Health and Safety Plan including:
- Directions and Maps to Hospital
- Emergency Contact Information
- First Aid Kit
- Emergency Eyewash (16 oz.)
- Emergency Communication Devices (Cell Phones, two-way radios, or equivalent)
- ABC Dry Chemical Fire Extinguishers for
- Office Trailer

- Each Truck or Piece of Equipment
- Fuel Storage Areas

At a minimum, at least two (2) on-site KEMRON and/or Gilbane employees will be First Aid and CPR certified by the American Red Cross, American Heart Association, or National Safety Council. KEMRON and/or Gilbane employees are currently First Aid and CPR certified and the dates of certification include:

Val Valdez	07/24/2014
Brad Olson	07/24/2014
Bruce McClain	07/24/2014
Audrey Johnson	07/24/2014

Documentation of First Aid and CPR Training records will be maintained in the on-site office and under control of the field manager.

8.2 Offsite Medical Support

A list of emergency contacts and the hospital information is provided above in Section 8.0. In the case of a medical emergency, the SSHO/UXOSO shall determine the nearest appropriate facility. The SSHP, included as Appendix A, provides driving directions to the nearest hospital.

Offsite medical and emergency response support will be coordinated with the POM Fire Department prior to the commencement of field work. Non-emergency correspondence to the POM Fire Department shall be maintained throughout the contract by the SSHO/UXOSO for integration of emergency services. There is limited 911 service at the former Fort Ord project location. However the SSHO/UXOSO will maintain a direct contact radio to the POM Fire and Police Departments in the event of an emergency.

KEMRON also coordinated the off-site medical support with the Santa Clara Valley Medical Center and the Community Hospital of the Monterey Peninsula. During telephone calls, KEMRON discussed the emergency capabilities and services necessary for the project with each hospital. A hospital administration representative for the Santa Clara Valley Medical Center stated that it is a Trauma Center and can accommodate the emergency services for this project; however, it is not the closest emergency hospital location. Therefore, the Community Hospital of the Monterey Peninsula, which is closer to the former Fort Ord, is also included. The contact information and addresses for each facility were confirmed. Communication records are included in Appendix D.

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SECTION 9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This Section details the specific levels of PPE which may be required or used to complete project activities. All site personnel will be trained (or have documented training) in the use of all PPE utilized. For the site work during implementation of the contract, the majority of the site work is expected to be completed in Level D PPE. However, an upgrade to Modified Level D PPE is the contingency PPE level in the event of skin contact hazards due to the environmental work at the site.

9.1 Description of Protection Levels

Engineering controls will be employed to eliminate and/or minimize exposure potential to the extent practicable. Where engineering controls alone cannot reduce exposure potential to less than published exposure limits, PPE will be employed. Air monitoring will be performed to determine the appropriate action level of PPE for each task outlined in the SSHP, which is included as Appendix A.

LEVEL A

Note: Use of Level A is not anticipated to be necessary for completion of tasks on this project. However, a description of the equipment, protection, and limiting criteria is provided in the event that Level A is determined to be necessary by the CSHM and/or SSHO/UXOSO.

EQUIPMENT REQUIRED:

- Positive pressure, full-face piece Self Contained Breathing Apparatus (SCBA) or positive pressure supplied-air respirator with escape SCBA
- Fully encapsulating, chemical-resistant suit
- Inner chemical-resistant gloves
- Coveralls/ Uniform
- Chemical-resistant safety toe boots
- Hard hat, as appropriate
- Two-way radio communications

OPTIONAL:

- Cooling unit
- Disposable gloves and boot covers
- Noise protection as required
- Flash Suit

PROTECTION PROVIDED:

- The highest available level of respiratory, skin, and eye protection.

SHOULD BE USED WHEN:

- The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either: measured (or potential for) exposure to high concentration of atmospheric vapors, gases, or particulate.

or

- Site operations and work functions involving a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulate of materials that are harmful to skin or capable of being absorbed through intact skin.
- Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.
- Operations must be conducted in confined, poorly ventilated areas until the absence of conditions requiring Level A protection is determined.

LIMITING CRITERIA:

- Fully encapsulating suit material must be compatible with the substances involved.
- Increased heat stress and reduced visibility/movement associated with fully encapsulating suits.

LEVEL B

Note: Use of Level B is not anticipated to be necessary for completion of tasks on this project. However, a description of the equipment, protection, and limiting criteria is provided in the event that Level is determined to be necessary by the CSHM and/or SSHO/UXOSO.

EQUIPMENT REQUIRED:

- Positive pressure, full-face piece SCBA or positive pressure supplied-air respirator with escape SCBA
- Hooded chemical-resistant suit (one or two-piece chemical splash suit; disposable chemical-resistant one-piece suit)
- Inner and outer chemical-resistant gloves
- Coveralls/ Uniform
- Chemical-resistant safety toe boots
- Hard hat, as appropriate
- Two-way radio communications
- Hearing protection

OPTIONAL:

- Disposable boot covers
- Face shield
- Modified Level B adds an outer chemical resistant suit

PROTECTION PROVIDED:

- The provided protection is the same level of respiratory protection as Level A but less skin protection. It is minimum level recommended for initial site entry until the hazards have been further identified.

SHOULD BE USED WHEN:

- The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection. This involves atmospheres with Immediately Dangerous to Life and Health (IDLH) concentrations of specific substances that do not represent a severe skin hazard;
- or
- Atmosphere does not meet the criteria for use of air-purifying respirators; atmosphere contains less than 20.0 percent oxygen.
- Presences of incompletely identified vapors or gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

- LIMITING CRITERIA:
- Use only when the vapor or gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through the intact skin.
- Use only when it is highly unlikely that the work being done will generate either high concentrations of vapors, gases, or particulate or splashes of material that will affect exposed skin.
- Increased heat stress and reduced visibility

TRIGGERS RESULTING IN UPGRADING PPE:

- Modifications to scope of work or task where potential exposure is increased and PPE is no longer appropriate.
- When atmospheric conditions change and respiratory protection is no longer appropriate.
- New monitoring information indicating that suspected dermal or inhalation hazard mandates upgrading PPE.

LEVEL C

Note: Use of Level C is not anticipated to be necessary for completion of tasks on this project. However, a description of the equipment, protection, and limiting criteria is provided in the event that Level is determined to be necessary by the CSHM and/or SSHO/UXOSO.

EQUIPMENT REQUIRED:

- Air purifying, cartridge equipped respirator
- Tyvek Suit (Coated or plain)
- Tyvek Hood
- Inner (such as nitrile sample gloves) and outer (such as cloth, leather, or chemical-resistant) gloves depending on the application.
- Disposable boot covers
- Chemical-resistant safety toe boots
- Hard hat (Class C), as appropriate
- Two-way radio communications
- Eye Protection (including goggles, safety spectacles, or face shields)
- Hearing Protection

OPTIONAL:

- Face shield
- Modified Level C adds an outer chemical resistant suit.

PROTECTION PROVIDED:

- The same level of skin protection as Level B, but a lower level of respiratory protection.

SHOULD BE USED WHEN:

- The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin.
- The types of air contaminants have been identified, concentrations measured, and a cartridge is available that can remove the contaminant.
- All criteria for the use of air-purifying respirators are met.

LIMITING CRITERIA:

- Atmospheric concentration of chemicals must not exceed IDLH levels.
- The atmosphere must contain at least 20.0 percent oxygen.

TRIGGERS RESULTING IN UPGRADING PPE:

- Modifications to scope of work or task where potential exposure is increased and PPE is no longer appropriate.
- When atmospheric conditions change and respiratory protection is no longer appropriate.

- New monitoring information indicating that suspected dermal or inhalation hazard mandates upgrading PPE.

MODIFIED LEVEL D

Note: Modified Level D is the secondary level of PPE designated for project tasks for the site. The assignment for Modified Level D is appropriate as an upgrade from Level D where additional protection is warranted from potential contact with impacted materials. Modified Level D will provide the appropriate skin protection when typical dermal exposure is expected.

EQUIPMENT REQUIRED:

- Chemical resistant clothing when contact with contaminated media is possible (one or two-piece chemical splash suit; disposable chemical-resistant one-piece suit)
- Inner (such as nitrile sample gloves) and outer (such as cloth, leather, or chemical-resistant) gloves depending on the application.
- Chemical-resistant safety toe boots
- Hard hat (Class C), as appropriate
- Safety Glasses w/ Side Shields
- Two-way radio communications
- Hearing Protection

OPTIONAL:

- Disposable boot covers
- Face shield
- Chemical Splash Goggles
- Modified Level D adds an outer chemical resistant suit

PROTECTION PROVIDED:

- Protection from dust and incidental contact with chemicals or contaminated surfaces or where respiratory hazards have been characterized to below established exposure limits or site action levels.

SHOULD BE USED WHEN:

- The atmosphere contains no immediate hazard.
- Work functions involve splashes or immersion.
- Modified Level D should be used when no atmospheric hazards exist but potential for dermal exposure is expected.

LIMITING CRITERIA:

- Modified Level D should only be worn where respiratory hazards have been characterized and determined to be below established exposure limits or site action levels.

- May not be used in areas where respiratory hazards exist or may be expected to develop.

TRIGGERS RESULTING IN UPGRADING PPE:

- Potential for dermal contact where Modified Level D is no longer appropriate and an outer suit is necessary.
- Modifications to scope of work or task where potential exposure is increased and PPE is no longer appropriate.
- When atmospheric conditions change and respiratory protection is necessary.
- New monitoring information indicating that suspected dermal or inhalation hazard mandates upgrading PPE.

LEVEL D

Note: Level D is the primary level of PPE designated for the site. Level D shall be used in any non-contaminated active work areas of the site including the support zone, during construction of site support facilities, during mobilization, during site restoration, and demobilization. Level D is considered the minimum level of protection acceptable for use at the site. The assignment for Level D is based on minimal contact with the impacted media. Level D will provide the appropriate however minimal skin protection when dermal exposure is expected. The contingency level of PPE is modified Level D for situations where additional protection is necessary.

EQUIPMENT REQUIRED:

- Standard Work Uniform
- Safety toe work boots
- Safety glasses w/ Side Shields
- Chemical Splash Goggle (Monogoggle) and Hard Hat (Class C), as appropriate
- Hearing Protection, as appropriate
- Leather Palm or Cotton Work Gloves

OPTIONAL:

- Gloves (Nitrile)
- Tyvek Suit (Plain)
- Coveralls (Fire Resistant Coveralls or other protective clothing may be worn to prevent exposure to poison oak)
- Face shield

PROTECTION PROVIDED:

- Level D provides minimal skin protection for splashes or chemical contact. Modified Level D provides increased skin protection.

SHOULD BE USED WHEN:

- The atmosphere contains no known hazard.
- Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemical.
- Modified Level D should be used when no atmospheric hazards exist but potential for dermal exposure is expected.

LIMITING CRITERIA:

- Level D should not be worn in the exclusion or contamination reduction zone. (Unless deemed acceptable by SSHO/UXOSO).
- No respiratory protection provided.

TRIGGERS RESULTING IN UPGRADING PPE:

- Potential for dermal contact where Level D is no longer appropriate, and or protective suit is necessary.
- Modifications to scope of work or task where potential exposure is increased and PPE is no longer appropriate.
- Entrance into exclusion or contamination reduction zone.
- When atmospheric conditions change and respiratory protection is necessary.
- New monitoring information indicating that suspected dermal or inhalation hazard mandates upgrading PPE.

9.2 Activity Hazard Assessment Procedures

The AHAs for the project task have been conducted by the APP preparer and reviewed by the CSHM. Each project task has been assigned a PPE Level in the AHA's which are included in Appendix A. According to the site specific conditions, the TM and SSHO/UXOSO shall determine the appropriate PPE requirements for the given task and modify the AHA's accordingly. Documentation of PPE Level modifications will be made by the SSHO/UXOSO and retained in the project file.

Activity Hazard Assessments will typically be conducted by task assessment and air monitoring to determine the appropriate action level of PPE for each task outlined at the onset of each task. However, based on the individual task and potential exposure routes, the hazard assessment method or air monitoring media will be modified to provide applicable data.

9.3 Certifications of Personnel using PPE

KEMRON employees performing tasks requiring the use of respiratory protective equipment must pass a yearly physical examination which includes a pulmonary function test as set forth under OSHA CFR 1910.134 and USACE EM 385 1-1 Sec. 5(G). Results from annual physical

examinations are maintained by KEMRON. Subcontractors must provide current medical records for employees requiring PPE. The SSHO/UXOSO shall determine the capabilities of subcontractor employees to don PPE.

9.4 PPE Training

All KEMRON employees, subcontractors, and site visitors will be appropriately trained by the SSHO/UXOSO regarding the site specific/task specific PPE requirements. The PPE selection will be discussed with all employees, subcontractors, and site visitors during daily safety meetings. The following shall be discussed during the daily safety meetings:

- When PPE is required;
- Scope of Work and what types of PPE are required;
- Proper donning, doffing, and use;
- Limitations of PPE; and
- Care, inspection, testing, maintenance, useful life, storage and disposal of PPE.

If the KEMRON SSHO/UXOSO or TM has reason to believe that any trained employee, subcontractor, or site visitor does not have an appropriate understanding of the use and care of PPE, then that individual will be retrained. The KEMRON SSHO/UXOSO shall ensure that every individual receives the necessary training, or retraining, to utilize PPE properly.

KEMRON will document all PPE training conducted, onsite and offsite. Each employee, subcontractor, or site visitor will receive written training documentation which indicates;

- The name of the employee;
- Date of training; and
- Subjects taught.

SECTION 10 PLANS AND PROCEDURES REQUIRED BY THE USACE SAFETY AND HEALTH REQUIREMENTS MANUAL

This section provides a list of plans and procedures that may apply to the project as required by Section 9 of Appendix A in EM 385-1-1 (USACE, dated July 2011 including changes and errata).

10.1 Site Layout Plans

Site layout plans are included in the applicable SSHP (Appendix A). The site layout plans for the project include the following:

- Location of temporary construction buildings;
- Location of facilities;
- Location of fencing;
- Location of access routes;
- Design of anchoring systems for temporary structures;
- Requirements of temporary facilities spacing according to International Building Code;
- Requirements for temporary power distribution in accordance with all applicable regulations; and
- Requirements for temporary ramps, trestles, scaffolds, and platforms.

10.2 Emergency Response Plans

In the event of an emergency, the appropriate emergency service organization shall be contacted by the PM and/or SSHO/UXOSO. Lists of emergency contacts are provided in Section 8.0 of this APP. A map to the nearest emergency medical facility will be posted at the work site and be maintained in all KEMRON and subcontractor vehicles at all times. Prior to commencing work at the site, the Emergency Response Plan will be tested by conducting appropriate drills. Employees will be briefed on the content of this APP and employees shall become familiar with information. The SSHO/UXOSO must be notified of any situation as soon as possible to help lead the appropriate actions. The PM, TM, and CSHM shall be notified of any accident or injury which occurs on a job site. Emergency Meeting locations (rally points) for the former Fort Ord Project Sites are illustrated on Figure 2.

10.2.1 Emergency Response Plan (Spills)

This Spill and Discharge Control Plan has been developed to prevent the contamination of soils, water, atmosphere, uncontaminated areas, equipment or material by the uncontrolled release of

hazardous waste and materials during field operations involved in this project. If hazardous or unknown potentially hazardous materials are unexpectedly spilled during project work activities; evacuate and secure the area (to keep out all personnel). KEMRON will follow the spill response procedures below:

1. Immediately report ALL spills (no matter how small) to the POM Fire Department and the CESPK Fort Ord COR.
2. Safety of personnel & protection of life take precedence over environmental protection and equipment damage.
3. Stop the release, if safe to do so.
4. Contain the spill with absorbents, booms, and pads

Offsite medical and emergency response support will be coordinated with the POM Fire Department prior to the commencement of field work. Non-emergency correspondence to the POM Fire Department shall be maintained throughout the contract by the SSHO/UXOSO for integration of emergency services.

Emergency Contact Information

KEMRON will post emergency contact information at each jobsite, typically in the office trailer or other designated area. KEMRON may also post this information on the visor(s) of each truck. In the event that an emergency situation arises at the jobsite, this posting shall expedite the emergency medical treatment, reporting, and response. This posted information will include the following:

- KEMRON Emergency Coordinator Contact Information
  - PM
  - TM
  - SSHO/UXOSO
- Emergency Contact Telephone Numbers and Reporting Instructions
  - Ambulance/ Emergency Medical Support
  - Hospital
  - Doctor/Physician
  - Fire Department
  - Police Department
  - CHEMTREC
  - National Response Center
  - Poison Control Center

  - Other Appropriate Agencies
- Location of Emergency Response Equipment
  - Fire Extinguishers
  - Spill Control Equipment and Materials
  - Special Equipment

Accountability

In the event of an evacuation, all employees, subcontractors, and site visitors will be accounted for by the SSHO/UXOSO. The sign in log will be used to accurately account for all personnel. The SSHO/UXOSO, along with the TM, will coordinate activities with all subcontractors to account for all onsite personnel. All subcontractor personnel are required to sign-in on the daily work log.

Responsibilities

The emergency response plan will include an evaluation of the AHA's developed under the direction of a certified industrial hygienist, or other competent person. AHA's include hazard controls.

The KEMRON emergency responses responsibilities are as follows:

- SSHO/UXOSO shall be available for all KEMRON employees, subcontractors, and site visitors to contact for information and clarification of the emergency response plan.
- The SSHO/UXOSO will be responsible conducting the daily safety meetings at the projects site. During these meetings, KEMRON employees will be assigned roles and duties for emergency response activities. If an evacuation if necessary, the SSHO/UXOSO will identify evacuation routes in the daily meeting held in an up wind location, based on the location of work. The SSHO/UXOSO is also responsible for posting all emergency contact phone numbers and addresses. The SSHO/UXOSO shall be responsible for communicating the location of this information with all KEMRON employees, subcontractors, and site visitors and conducting a test of the emergency procedures to ensure effectiveness.
- The PM will ensure that the USACE Ordnance and Explosives Safety Specialist (OESS) approves the emergency response procedures and reviews the hazard evaluation program for each work plan.
- A CIH or other competent person will evaluate the operations, materials, and equipment that may involve potential exposure to site workers and develop appropriate hazard evaluation and emergency response plans. AHA's for operations, activities, and any other hazards are included in Appendix A of the

SSHP. AHA's are reviewed or approved by qualified personnel as indicated on the AHA forms.

For large spills of hazardous materials, a Hazardous Materials Response Team may need to be contacted to limit exposures to site personnel and/or the surrounding area or community. In order to minimize the likelihood or severity of a hazardous materials spill, the following measures will be implemented:

- The use of hazardous materials will be minimized to the extent practicable.
- Hazardous materials will be stored in a specified location within secondary containment;
- Spill response kits will be stored wherever hazardous materials are used, shipped, or stored;
- Workers will be trained to use the spill kits by conducting scale tests to ensure their effectiveness; and
- Workers will be trained on the proper steps to follow in case of a hazardous material spill.

The SSHO/UXOSO will conduct annual "spill response drills" to mimic an actual event as a means of determining the proper personnel training and response. The former Fort Ord project site illustrating a current emergency assembly location or rally point is included in Figure 2. The emergency routes and assembly locations may be updated as site conditions change. The SSHO/UXOSO will identify evacuation routes at the daily meeting in an upwind location, based on the location of the work.

Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities. Regardless of the type of spill (liquid or solid), the following measures will be taken to isolate the spilled material:

- The TM and/or SSHO/UXOSO will be notified immediately when a spill, or the threat of a spill, is observed.
- The SSHO/UXOSO will assess the situation and determine the appropriate response.
- The TM and./or SSHO/UXOSO will evaluate the situation to ensure it is safe for personnel to begin cleanup operations;
- The SSHO/UXOSO, will assign the level of protection to be worn by the spill response personnel;
- All required supplies will be assembled and positioned such that they are readily available to the spill response personnel;

- Spill response personnel will take measures to stop the spill and will, if applicable, use an absorbent or adsorbent to collect the spilled material;
- Isolate and contain the spill area;
- Restrict access of unauthorized personnel;
- Prevent contact with the spilled material;
- Relocate personnel upwind and up gradient of the spilled material;
- Take air, soil, or other appropriate samples to determine if cleanup is complete; and
- Prepare a Spill Report containing;
    - Description of the material spilled including identity, quantity, and a copy of any waste manifests or bills of lading. Identify the cause of the spill. (If possible, SDS sheets for spilled material and material used to clean it up will be included in any Spill Reports generated.);
    - Exact time and location of the spill and a description of the area involved;
    - Containment procedures utilized;
    - A description of the corrective actions implemented during the spill including the disposal of the cleanup residues; and
- A summary of the communications between KEMRON and the CESPK Fort Ord COR.

In the event of a spill or release of a solid material, KEMRON will remove and place contaminated materials in an appropriate drum with a cover. The container should be appropriately labeled and disposed of as soon as possible. In the event of a spill or release of a liquid KEMRON will absorb the liquid utilizing an appropriate absorbent material. The absorbent material will be placed in an appropriate drum with a cover. The container should be appropriately labeled and disposed of as soon as possible.

In the event of a discharge of liquid into the soil, the TM and/or SSHO/UXOSO or their designee will immediately identify the location of the discharge and take appropriate remedial actions to eliminate further spillage. The discharged liquid material will be controlled and disposed of as described above. In all other situations (you say this again below under fires) or catastrophic incidents beyond their level of training and competency, employees will be trained in/ how to take the following actions:

- Notify Emergency Personnel;
- Activate any alarm system(s);
- Follow evacuation procedures, specified routes, proceed to the agreed upon meeting places, and assure accountability for all personnel;

- Use of - and when to use - a fire extinguisher;
- Use of first aid/CPR; and
- Rescue operations as necessary.

10.2.2 Emergency Response Plan (Fires)

This Fire Response and Prevention Plan has been developed to prevent personal injury and site or equipment damage during field operations involved in this project. The SSHO/UXOSO shall be responsible for reviewing the emergency response procedures with all affected employees. Emergency response escape routes for the site and protocols during and after emergency situations will be discussed during the daily tailgate safety meetings. Chemical inventories developed under the project-specific hazard communication program will be reviewed with all site personnel.

The SSHO/UXOSO will conduct annual "fire response drills" to mimic an actual emergency event as a means of determining the proper personnel training and response. The former Fort Ord project site illustrating a current emergency meeting location, or rally point, is included in Figure 2. The emergency routes and meeting locations may be updated as site conditions change. The TM along with the SSHO/UXOSO will identify evacuation routes at the daily meeting in the upwind direction, based on the location of the work.

Emergency Contact Information

KEMRON will post emergency contact information at each jobsite on a bulletin board at the location of the daily safety meeting, typically adjacent to a KEMRON truck or other designated area. KEMRON may also post this information on the visor(s) of each truck. In the event that an emergency situation arises at the jobsite, this posting shall expedite the emergency medical treatment, reporting, and response. This posted information will include the following:

- KEMRON Emergency Coordinator Contact Information
  - TM
  - SSHO/UXOSO
- Emergency Contact Telephone Numbers and Reporting Instructions
  - Ambulance
  - Hospital
  - Doctor/Physician
  - Fire Department
  - Police Department
  - CHEMTREC

  - o National Response Center
  - o Poison Control Center
  - o Other Appropriate Agencies
- Location of Emergency Response Equipment
  - o Fire Extinguishers
  - o Spill Control Equipment and Materials
  - o Special Equipment

Accountability

In the event of an evacuation, all employees, subcontractors, and site visitors will be accounted for by the SSHO/UXOSO. The sign in log will be used to accurately account for all personnel. The SSHO/UXOSO will coordinate with all subcontractors to account for all their on-site personnel. All subcontractor personnel are required to sign-in on the daily work log.

Responsibilities

The emergency fire response plan will include an evaluation of the AHA's developed under the direction of a certified industrial hygienist, or other competent person. AHA's include hazard controls. The KEMRON emergency responses responsibilities are as follows:

- SSHO/UXOSO shall be available for all KEMRON employees, subcontractors, and site visitors to contact for information and clarification of the fire emergency response plan.
- SSHO/UXOSO will be responsible conducting the daily safety meetings at the projects site. During these meetings, KEMRON employees will be assigned roles and duties for emergency response activities due to fire. If an evacuation if necessary, the PM and the SSHO/UXOSO will identify evacuation routes in the daily meeting held in an up wind location, based on the location of work. The SSHO/UXOSO is also responsible for posting all emergency contact phone numbers and addresses. The TM and/or SSHO/UXOSO shall be responsible for communicating the location of this information with all KEMRON employees, subcontractors, and site visitors and conducting a test of the emergency procedures to ensure effectiveness.
  - o The PM will ensure that the USACE OESS approves the emergency response procedures and reviews the hazard evaluation program for each work plan.
  - o A CIH or other competent person will evaluate the operations, materials, and equipment that may involve potential exposure to site workers and develop appropriate hazard evaluation and emergency response plans. AHA's for operations, activities, and any other hazards are included in Attachment 2.

AHA's are reviewed or approved by qualified personnel as indicated on the AHA forms.

Emergency fire response equipment will be inspected and maintained as necessary to replace any materials used in fire response activities. The following measures will be taken to isolate fires and protect personnel:

- The TM and/or SSHO/UXOSO will be notified immediately when a fire, or the threat of a fire, is observed.
- The TM will assess the situation and determine the appropriate response. KEMRON will only attempt fire suppression or extinguishing activities in the event that the situation is manageable for onsite personnel and equipment. In the event of a large fire or uncontrollable situation, KEMRON will evacuate personnel and contact the POM Fire Department.
- The SSHO/UXOSO will evaluate the situation to ensure it is safe for personnel to begin fire suppression or appropriate response operations; or notify the Fire Department;
- The SSHO/UXOSO will assign the level of protection to be worn by the fire response personnel;
- All required supplies will be assembled and positioned such that they are readily available to the fire response personnel;
- Fire response personnel will take measures to isolate and suppress the fire;
- Restrict access of unauthorized personnel;
- Relocate personnel to the emergency meeting location and/or upwind of the fire; and
- Prepare an Incident Report that contains the following information:
    - Identify the cause of the fire. (If possible, SDS sheets for material used during response will be included in any Incident reports generated.);
    - Exact time and location of the fire and a description of the area involved;
    - Isolation and suppression procedures utilized;
    - A description of the corrective actions implemented; and
    - A summary of the communications between KEMRON and the CESPK Program Manager.

In situations such as fires or other catastrophic incidents beyond their level of training and competency, employees will be trained to take the following actions:

- Notify Emergency Personnel;
- Activate any alarm system(s);

- Follow evacuation procedures, use specified routes, proceed to the agreed upon meeting places, and assure accountability for all personnel;
- Use of and when to use, a fire extinguisher;
- Use of first aid/CPR; and
- Rescue operations as necessary.

Offsite medical and emergency response support will be coordinated with the Presidio of Monterey Fire Department prior to the commencement of field work. Non-emergency correspondence to the POM Fire Department shall be maintained throughout the contract by the SSHO/UXOSO for integration of emergency services.

A list of emergency contacts and the hospital is provided above in Section 8.0. In the case of a medical emergency the SSHO/UXOSO shall determine the nearest appropriate facility. The SSHP, included as Appendix A, provides driving directions to the nearest hospital.

All emergency contact phone numbers and addresses shall be posted onsite. The SSHO/UXOSO shall be responsible for communicating the location of this information with all KEMRON employees, subcontractors, and site visitors.

10.2.3 Emergency Response Plan (Marine Emergencies)

Marine activities are not associated with the tasks to be performed under this contract.

10.3 Hazard Communication Program

The intent of this program is to inform KEMRON personnel of any chemical hazards to which they may be exposed during site work. The Hazard Communication Program will provide education to all KEMRON employees, office workers and field personnel on how to interpret and use information provided on labels, pictograms, Safety Data Sheets (SDS) if available, and how to protect themselves from chemical hazards in the workplace. The program is intended to comply with OSHA's Hazard Communication Program requirement, 29 CFR 1910.1200, the Resource Conservation and Recovery Act, the United Nations' Globally Harmonized System (GHS) of Classification and Labeling of Chemicals and 40 CFR 260 et seq.

Information on the hazards of chemical agents present on project sites and in the work place will be communicated to employees, and employees will be trained in the recognition, location and protective measures appropriate for those chemical hazards.

Hazardous Materials Inventory

The SSHO/UXOSO shall be responsible for preparation of the hazardous chemical (physical or health hazard) inventory for each project site. The inventory will be reviewed by the SSHO/UXOSO or designated representative. The hazardous materials list inventory will be conducted using the following process.

- Each work area will be surveyed for all hazardous or potentially hazardous materials.
- Purchasing records may be reviewed for additional hazardous materials information.
- A list of the hazardous materials will be compiled by recording the vendor, chemical name, common name, work area and/or process, and the primary hazards.
- Products found during the inventory that cannot be identified, through labeling or other means, will be evaluated as to their usefulness. These products, along with hazardous materials that are not in current use, will be disposed of properly and not included in the initial inventory.
- An SDS for each product listed on the Hazardous Materials Inventory must be obtained. All hazardous materials removed from the work area that will not be used in the future, will have the corresponding SDS removed from the file. These SDSs will be placed in an inactive file and will be retained until the completion of the field work from the last date of known use.

Once the inventory is completed, it must be maintained in a central location, accessible to employees. The inventory must contain the following information.

- Location of the hazardous material
- Chemical name referenced on the SDS
- Product name (name used in process or application)
- Manufacturer's name
- Date of the most current SDS

A copy of the Hazardous Chemical Inventory Form is included in Appendix E.

The storage location for all hazardous materials will be determined by the KEMRON SSHO/UXOSO representative prior to mobilization. At this time the current location of any site storage area has not been established. The locations of chemical storage will be identified on the site map upon commencement of fieldwork.

Labeling

Manufacturers are required to label their containers of hazardous materials. Therefore, KEMRON will use the product label as the primary means of warning employees about the hazards of the products. The SSHO/UXOSO, working with the PM will be responsible for reviewing materials used which may be hazardous. The SSHO/UXOSO will ensure that labels and warnings that are present on products received by KEMRON are left on the product. Employees are prohibited from removing or defacing labels on in-coming products. Labels may include words, pictures symbols or combinations thereof to specify methods to address hazard warnings.

If hazardous chemicals are placed into other containers for individual use, the SSHO/UXOSO will assure that appropriate labeling is applied to the new container. All containers of hazardous chemicals in the workplace will be labeled or tagged. Labels must include:

- The product name or identity of the hazardous chemical contained therein
- Signal word – Danger or Warning
- Hazard Statement(s)
- Precautionary statement(s)
- Pictogram(s)
- Name, address, and telephone number of the chemical/material manufacturer, importer or other responsible party

Every person who works with or around chemicals must understand the Labeling System. There are four basic hazards:

- Health Hazards are those that can affect the immediate or long term health of an employee if exposed to a specific chemical. Acute effects of exposure are those that present symptoms when exposure occurs, such as when skin is exposed to an acid. Delayed or long term health effects can also occur from chemical exposure, such as cancer. Health effects for any given chemical will depend on the toxicity, duration of exposure and level of exposure.
- Fire Hazard ratings range from *non-flammable* to *highly flammable.* The National Fire Protection Association (NFPA) ratings are based on the material flashpoint—the temperature at which the chemical *vapors* will ignite.
- Reactivity ratings describe the hazards of the material stability - some chemicals will explode or react violently if exposed to heat or shock
- Other Hazards - special markings are required if the material is radioactive, an oxidizer, acid or base, or will react when exposed to other materials.

Hazard Controls include:

- Labeling of all chemicals
- Proper chemical storage containers & areas
- Segregation of incompatible chemicals
- PPE
- Use of chemicals by trained and authorized employees
- Use of minimum amount necessary

- Bonding & Grounding of flammable liquid containers

Pictograms are graphic symbols used to communicate specific information about the hazards of a chemical. On hazardous chemicals being shipped or transported from a manufacturer, importer or distributor, the required pictograms consist of a red square frame set at a point with a black hazard symbol on a white background, sufficiently wide to be clearly visible. A square red frame set at a point without a hazard symbol is not a pictogram and is not permitted on the label. The pictograms OSHA has adopted improve worker safety and health, conform to the GHS, and are used worldwide. GHS uses a total of nine pictograms, illustrated below:

Labels and pictograms will be legible and written in English. Should non-English speaking employees be employed by KEMRON in a position that is subject to the Hazard Communication Program, the SSHO/UXOSO will ensure that information is provided in the employee's native language.

Safety Data Sheets (SDSs)

The SSHO/UXOSO will obtain SDSs when possible for all commercially acquired substances from manufacturers and/or vendors of all hazardous chemicals used in the workplace or at the job sites, and maintain the SDS File. The SSHO/UXOSO is responsible for communicating KEMRON's HAZCOM program, including new and updated SDSs, to employees based at or from his/her location on a continuing basis. Employees will be instructed on where to locate the hazardous chemical inventory and corresponding SDSs, and methods/observations that may be used to detect the presence or release of any hazardous chemicals that may be encountered, including monitoring devices, visual appearance or odor.

The SSHO/UXOSO will use SDSs to determine chemical names and hazardous chemicals identified in each product. He/she will complete the Hazardous Chemical Inventory and update new materials as they are received or removed and as operational changes are made. The SDS will provide comprehensive information about the chemical product that allows employers and workers to obtain concise, relevant and accurate information that can be put in perspective with regard to the hazards, uses and risk management of the chemical product in the workplace.

The following 16 sections are mandatory under the GHS standard:

1. Identification
2. Hazard(s) identification
3. Composition/ information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure control/ personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

Where required by state or local regulation, copies of SDSs will be submitted to regulatory agencies. The CSHM will determine the local requirements and complete any required submittal(s).

If a product is received for which KEMRON does not have an SDS, one must be requested from the manufacturer/vendor. Employees will not be permitted to use any hazardous chemical for which an SDS has not been received.

Any new or updated SDS received by any KEMRON employee must be immediately transmitted to the SSHO/UXOSO. Upon receipt of a new or updated SDS the following steps will be implemented.

- The SSHO/UXOSO will review the SDS and, if complete, add it to both the project and office SDS File. If there is no primary job site, the HAZCOM for the job will be sent with the employee(s) and a copy placed in the project file.
- Employees will be notified of any additions to the SDS File concerning their projects, and associated hazards, applicable protection measures, PPE, emergency measures and other applicable health and safety factors related to materials identified on the SDSs.

Non-routine Tasks and Unlabeled Containers

When conducting non-routine tasks, the TM and SSHO/UXOSO will ensure that all hazards have been properly identified and communicated to employees through the project-specific health and safety plan and associated activity hazard analysis.

Additionally, should unlabeled materials be encountered during a project, such as unlabeled drums, containers, or pipes potentially containing chemicals, employees will notify the SSHO/UXOSO, who will confer with the TM and/or other KEMRON experts to determine the appropriate course of action. No unlabeled containers will be handled or managed by KEMRON personnel without first conferring with appropriate health and safety personnel, knowledgeable client personnel, and other appropriate subject-matter experts to determine appropriate safe means of completing the work tasks.

Employee Information Requests

Employees have the right to request a copy of any SDS for the hazardous chemicals that are present in their work area (in accordance with 29 CFR 1910.1200(e)). KEMRON will not deny, or require any employee to waive, this right. Employees who wish to obtain copies of SDSs should submit a written request to the SSHO/UXOSO. It is the responsibility of the SSHO/UXOSO to ensure that employees receive information pertaining to the chemical(s) requested.

Employee Training

All KEMRON employees who work in areas where hazardous chemicals are used, handled or stored will complete Hazard Communication program training. Employees are to be trained in accordance with applicable federal and state requirements. The training program will inform employees of the requirement of the law, the employee's responsibilities and the employee's rights. Employees must be trained to know the chemicals they work with, the associated physical and health hazards, the appropriate protective measures to be taken, and the steps to be taken in a medical emergency. Each person, at each session, will sign an attendance sheet distributed by the instructor. Records of attendance will be maintained in employee files.

At a minimum, training must include:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area;
- The physical and health hazards of the chemicals in the work area;
- Measures employees can take to protect themselves from the physical and health hazards in the work area, including company or project specific procedures and work practices such as PPE, emergency procedures, etc.;
- Explanation of the labeling system and SDS; and
- How the employee can obtain and use the hazard information.

The following levels of Hazard Communication Training will be performed:

- New Employees - Within 3 months after hire, new employees at KEMRON will receive instructions on the overall requirements of the Hazard Communication Standard, and the hazardous chemicals that they may use or may be exposed to in the course of their work activities.
- Employee Transfers - Whenever an employee is transferred to a job that exposes the employee to hazardous materials previously not used, the employee will receive instructions on the new material and safe handling procedures, within 30 days of transfer.
- Introduction of New Materials - Whenever a new hazardous material is introduced into the workplace, employees will be notified and will receive instruction on the associated hazard(s) and precautions via a memo issued by the PM.
- Annual Update Training - A general overview of the Hazard Communication Standard, SDS and labels will be provided annually for all affected employees.

Training records will be kept on all initial and Hazard Communication Standard training update sessions. A copy of the log will be placed in each employee's personnel file.

Contractors/Subcontractors

KEMRON personnel working on a site where there are other contractors present must provide a copy of the SDSs for chemicals that they bring to the site. Every firm working in close proximity to a KEMRON operation must be asked if they want a copy of the KEMRON SDSs. This discussion must be documented in the daily observation sheets.

Site contractors, subcontractors and/or non-employees will be advised of the hazards associated with materials being used in KEMRON work areas. No assumptions will be made about contractors and/or non-employees knowledge of the potential hazards associated with working in KEMRON work areas. The contractor, subcontractor, and/or non-employee will be notified about the location of the SDSs for hazardous materials which may be used by KEMRON in their assigned work area. Non-essential personnel will not be permitted in areas where hazardous chemicals are in use.

10.4 Respiratory Protection Plan

This written respiratory protection program has been prepared to provide requirements, standards and guidance for the proper training on, selection, fitting, use and care of respiratory protective equipment. Engineering controls will be used to the extent possible to prevent contamination of the work place atmosphere and removal of hazards. When engineering controls are not feasible, or while engineering controls are being put in place, appropriate respirators must be used. Respiratory protection equipment is used when working with materials that can be toxic, harmful or nuisance when encountered as a gas, dust, fume, mist or vapor, or when insufficient oxygen is present.

Qualification

Only qualified and trained personnel are authorized to use respiratory protective equipment. To qualify, an employee must have received:

- Medical clearance.
- Instruction from qualified safety personnel in the selection, use and care of the equipment.
- Training and fit testing that conforms to government standards on NIOSH-approved equipment.

Qualification automatically terminates when anything prevents a mask-to-skin seal, including facial hair, or use of a respirator type for which the employee has not been qualified and/or trained.

Administration and Responsibilities

KEMRON's CSHM is responsible for overall administration of the respiratory protection program, as a component of KEMRON's corporate health and safety program, outlined in Section 1 of this manual. The CSHM is supported in the implementation of the respiratory protection program by PMs, and SSHO/UXOSOs.

Administrator Responsibilities (CSHM)

The CSHM administrates the respiratory protection program for KEMRON employees. The CSHM is assisted in the implementation of elements of the program by the SSHO/UXOSO. Responsibilities of the CSHM include:

- Compliance and documentation of exposure monitoring activities
- Respirator selection
- Worker training
- Quality control reviews
- Medical monitoring and medical examinations
    - Maintenance of written programs and procedures

Supervisor Responsibilities (SSHO/UXOSO)

The supervisor (SSHO/UXOSO) will consider designing processes that eliminate or minimize the need for respiratory equipment. When engineering controls or other measures are not feasible or effective in mitigating the hazard, or emergency situations with exposure potential occur, respiratory equipment may be necessary. If situations or conditions mandate the use of respiratory protective equipment, the SSHO/UXOSO must adhere to and assume the following responsibilities:

- Be knowledgeable in the application and use of all respiratory protective equipment requirements including its limitations.
- Perform an exposure/hazard assessment as part of the project activity hazard analysis prior to initiating any field work, to ensure appropriate respirator selection based on current site conditions.
- Ensure assigned personnel are medically approved, trained and fit tested prior to wearing and/or assisting in the use of respiratory protective equipment.
- Review work assignments for accidental exposur10e and/or equipment limitations.

KEMRON provides required respiratory equipment to employees at no cost. Employee-owned respirators are NOT to be used on any KEMRON project.

Employee Responsibilities

The employee is required to always inspect and ensure that respiratory protective equipment is in proper working condition prior to using it, and must use the equipment as instructed. Employees who are assigned respiratory protective equipment are responsible for completing the following steps during and after each use:

- Prior to each use, inspect and fit check to ensure the equipment is operable and will provide proper protection.
- Follow instructions for proper selection, use, care, cleaning, and storage of respiratory protective equipment. This includes thoroughly cleaning and disinfecting the respirator after each use, and storing the respirator in a clean, sealed bag or container in an appropriate area.
- Promptly report respirator problems to the supervisor.
- Return equipment to the respiratory protection program manager for needed servicing.

Selection of Respiratory Protective Equipment

Selection of all respiratory protective equipment will be made by the SSHO/UXOSO. Respiratory protective equipment requirements will be described in the SSHP. Only NIOSH-certified respirators will be used.

Respirators will be selected on the basis of hazards to which there is a potential for exposure. To accomplish this, information must be collected and carefully evaluated. The environment will be sufficiently evaluated to ensure that the level of protection afforded is adequate. As with all PPE selection, respiratory protection will be selected based upon the results of a project activity hazard assessment, and the basis of PPE selected will be documented in the project file.

For the former Fort Ord project site, it is anticipated that the majority of the work will occur in Level D or Modified Level D without the need for respiratory protection. However, the SSHO/UXOSO will review the site conditions prior to initiation of each task and determine the proper level of PPE.

Respiratory Hazards

There are three basic classifications of respiratory hazards: oxygen deficiency; dusts & mists (particulate matter); and gases and vapors.

Normal ambient air contains an approximate oxygen concentration of 20.8% by volume. When the oxygen level falls below 19.5%, the air is considered oxygen deficient. Oxygen concentrations below 16% are considered unsafe for human exposure due to effects on bodily functions, mental processes and coordination.

Particle Contaminants

Particle (dust & mist) contaminants can be classified according to their physical and chemical characteristics and their physiological effect on the body. Particles <10 microns (µ) in diameter have a greater chance to enter the upper and central respiratory system, and particles <5 µ in diameter can reach the deep lung (bronchiole or alveolar region). The various types of airborne particulate matter can be classified as follows:

- Fumes – An aerosol created when solid material is vaporized at high temperatures and then cooled. As it cools, it condenses into extremely small particles (<1 µ). Fumes can be generated from operations such as welding, cutting, smelting or casting molten metal.
- Dusts – An aerosol consisting of mechanically produced solid particles derived from the breaking up of larger particles. Dusts generally have a larger particle size when compared to fumes. Operations such as sanding, grinding, crushing, drilling, machining, or sand blasting produce dust. Dust particles often range in size from 0.5 to 10 µ.
- Mists – An aerosol formed by liquids which are atomized and/or condensed. Mists can be created by such operations as spraying, plating or boiling, and by mixing or spray cleaning activities. Aerosols are usually found in the size range of 5 to 100 µ.

Gas and Vapor Contaminants

Gas and vapor contaminants can be classified according to their chemical characteristics. True gaseous contaminants are similar to air in that they possess the same ability to diffuse freely within an area or container. Nitrogen, chlorine, carbon monoxide and carbon dioxide are examples of gases. Gases may be classified as inert, acidic or alkaline

Vapors are the gaseous state of substances at a temperature where it can co-exist with its liquid or solid state at room temperature. They are formed when the solid or liquid evaporates. Gasoline, Stoddard solvent and paint thinner (mineral spirits or turpentine) are examples of liquids that evaporate easily, producing vapors. Vapors are classified as organic, acidic, basic or organometallic (poison).

Types of Respiratory Protective Equipment

The basic purpose of any respirator is to protect the wearer from inhalation of hazardous materials/atmosphere. Respirators provide protection either by removing contaminants from the air before inhalation or by supplying an independent source of clean air. These principles delineate the two basic respirator types.

A device that provides a source of clean or approved breathable air independent of ambient air is called an air-supplying respirator (ASR). These devices operate under positive pressure

created by the external air source. Both can be sub classified by the type of inlet covering and the mode of operation.

The inlet covering serves as a barrier against contaminated atmospheres and as a framework to which air-purifying or air-supplying elements are attached.

Tight-Fitting Respirators

Tight-fitting coverings or face pieces are made of flexible materials such as butyl rubber, silicone, or neoprene. The face pieces are held on by the use of rubber or elastic straps which buckle at the back of the head.

These face pieces are of three basic configurations. The first type is a quarter-face covers just the mouth and nose and the lower sealing surface rests above the chin. These are typically used for protection against nuisance particulates or very low concentrations of known contaminants.

The second type is a half-face mask which covers the nose, mouth and chin. These provide a larger sealing surface than the quarter-mask and are preferred for use against more toxic materials. Both of the above devices provide no eye protection.

The third type of tight-fitting device is the full-face respirator. This mask covers the area from the hairline to below the chin.

Because of this large sealing surface they provide the greatest degree of respiratory protection, provide some degree of eye protection and are the most commonly used of the three types.

Mouthpiece respirators are the most basic types of device and consist of a nose clamp and mouthpiece that is held in the teeth. These devices prevent verbal communication, may cause fatigue of the jaw and provide no eye protection. Therefore they are restricted for use as escape devices.

Loose-fitting Respirators

These devices include hoods, helmets, suits and blouses. At a minimum, they must enclose the head and when the neck and shoulders are included consist of a hood. A helmet incorporates a rigid headgear into the design and a blouse extends down to the waist and may include wrist-length sleeves. These are typically used for abrasive blasting and hood/helmet materials are designed to withstand rebounding particles. Compressed air breathing sources are normally used and headgear includes an impact resistant eye/face-shield for protection against abrasive particles.

Air Purifying Respirators (APRs)

A device that removes contaminants from the ambient air is called an air-purifying respirator (APR). These devices operate under negative pressure created through inhalation. This

negative pressure allows contaminated air to move through purifying elements and into the face piece.

Particle Filtering APRs

These are used for protection against dusts, fibers, mists, radon daughters and fumes. A dust is a mechanically generated solid particle, a mist is an aerosol or a liquid condensation particle and a fume is a solid condensation particle usually produced from vaporized solids.

Most particle filtering respirators use fibrous materials to remove the contaminant. As a particle is drawn into the filter through inhalation, the filter media traps it. The efficiency of the filter depends on the size, velocity and composition of the particle. As particles are captured in the media it becomes clogged. This loading process can potentially increase the collection efficiency of the filter, but also increases the breathing resistance eventually requiring replacement of the filter cartridge.

The filter media for particle capture includes three basic types. The most common is the flat disk of random laid, non-woven fiber material which is designed to provide maximum natural collection with minimum resistance. Other types include natural wool or synthetic blend felt to which an electrostatic charge is applied. A disadvantage to this type is the loss of the charge due to oily atmospheres, high humidity and age.

A sticky resin can also be applied to the fiber material causing particles to adhere to the filter pad. Finally a high efficiency particle air filter has been developed for protection against radioactive particles, toxic dusts and mists, asbestos fibers, and other carcinogenic particles considered respirable (<10 um).

Gas and Vapor Removing APRs

These devices are used for protection against the other major class of airborne contaminants; gases and vapors. APRs are commercially available for specific gases/vapors (i.e. ammonia gas and mercury vapor) and classes of gases/vapors (i.e. acid gases and organic vapors).

Unlike particle filtering devices which are effective against particles as a whole, the cartridges used in gas/vapor removal are designed to be specific for known contaminants. These respirators are fitted with cartridges or canisters containing a granular material commonly referred to as sorbent. The general method by which removal occurs is called sorption, although some gas cartridge or canisters may be equipped with a catalyst for removal of contaminants. Such cartridges have a relatively short lifespan and are subject to damage from moisture buildup.

Since the majority of workplaces involve more than one type of respiratory hazard, respirators are usually equipped with combination (or piggyback) cartridges. These cartridges are capable of removing both particulate and gas/vapor air contaminants and are available from most manufacturers.

Powered Air-Purifying Respirators (PAPR)

These devices remove airborne contaminants through the same mechanisms as non-powered APRs but utilize a small blower to provide a degree of positive pressure in the face piece. The purifying element may be filter to remove particulates, a cartridge to remove gases/vapors or a combination cartridge to remove both.

PAPRs come in several configurations including those with belt-mounted cartridges and blower on chin mounted cartridges and blower. A third type of PAPR consists of a loose fitting helmet or hood and face piece. Purified air is circulated over the face and out under the face piece. These devices utilize a small, rechargeable battery pack usually worn at the belt to power the blower.

PAPR's are sometimes preferred over APR's because they supply a source of positive pressure and allow use in higher contaminant concentrations. They also tend to keep the wearer cooler and less fatigued. This is due to the increased air movement in the mask and the decreased effort required for inhalation. However, one disadvantage of PAPR's is the potential for shorter cartridge life spans also due to the positive pressure aspect.

Advantages and Disadvantages of APRs

- APRs are generally small and easily maintained.
- APRs can restrict the wearer's movements but not as much as other protective devices. Communications and visual field are restricted which can result in decreased ability to accomplish job functions and increase the probability for accidents.
- APRs cannot be used in oxygen deficient atmospheres (<19.5%) nor in atmospheres IDLH.
- The limits of airborne contamination are listed on the cartridge and should not be exceeded as breakthrough can occur.
- This means that the type and properties of the contaminants must be known and that air monitoring may be required to confirm these conditions before a respirator can be used.
- Negative pressure created in the face piece of an APR during inhalation. This would allow contaminants inside the mask should a leak or improper fit occur. Care should be taken to provide a respirator that is fitted to the wearer and training to ensure proper donning and adjustment.
- Gas/Vapor removing APRs have the same advantages as particle filtering devices in size and weight. However, certain cartridges/canisters have higher breathing resistance than filters and therefore cause an increased burden on the wearer. Like filters, cartridges/canisters are subject to degradation from the environment.

Extremes in humidity can cause clogging and interrupt the chemical reactions occurring in the cartridge.

- Unlike particle filters, gas cartridges/canisters have a sorbent material which becomes saturated or "spent" with use. This can occur rapidly in high concentrations and allow contaminants into the face piece. For this reason, it is crucial that the wearer be familiar with the type of contaminant, its warning properties and that a proper cartridge change out schedule be maintained.
- PAPRs have the advantage of providing a constant flow filtered air supply to the wearer. This tends to provide a cooling effect and decreases breathing resistance thereby making the respirator more comfortable to wear.
- Disadvantages of PAPRs include those common to all APR's such as bulkiness, decreased visibility and communications. PAPRs also have additional considerations of battery replacement and mechanical failure. If the blower should stop, the user should leave the work area and proceed to a clean area for repairs/replacement.

Air Supplying Respirators (ASRs)

ASRs are designed to provide a clean source of air regardless of the working environment and are specially designed to protect employees from hazardous atmospheres at greater concentrations than APRs. Because of this distinct advantage the use and care of these devices are more restrictive.

For the former Fort Ord project site, it is not anticipated that Air Supplying Respirators will be utilized for any of the tasks.

Exposure Assessment

All areas where respiratory protection is required shall be assessed for exposure potential. Examples of when to consider assessments include but are not limited to:

- When there is potential for exposure to a substance in excess of an acceptable limit: including OSHA Permissible Exposure Limit (PEL), NIOSH recommended explosure limits (REL), or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) (whichever is more stringent).
- When a hazard evaluation determines the presence of a hazardous environment
- When the workplace contains visible emissions (e.g., fumes, dust, aerosols).

Specific characteristics of the airborne hazard must be established in order to select an appropriate respirator.

- Is the airborne contaminant a particle (dust, fibers fumes, mist, and aerosol) or a gas/vapor?

- Is the airborne contaminant a chemical - and are material safety data sheets available?
- Is the airborne contaminant biological (bacteria, mold, spores, fungi, and virus)?
- Are there any mandatory or recommended occupational exposure levels for the contaminant?

Many approaches for estimating worker exposures to respiratory hazards may be used including:

- Sampling - Personal exposure monitoring is the preferred method for determining employee exposures because it is the most reliable approach for assessing how much of a given contaminant or exposure potential is present and what type of respiratory protection is required in a given circumstance.
- Sampling should utilize methods appropriate for the known or suspected contaminants(s) based on the method(s) for analysis and the laboratory protocols.
- Sampling should represent the worst case exposures; or enough full shifts and specific operations to determine the range of exposure(s).
- Objective Information - You may rely on information and data that indicate that use or handling methods of a product or material cannot, under worst-case conditions, release concentrations of a respiratory hazard above a level that would trigger the need for respirator use - or require use of a more protective respirator.
- You can use data on the physical and chemical properties of air contaminants, combined with information on room dimensions, air exchange rates, contaminant release rates, and other pertinent data (including exposure patterns and work practices) to estimate the maximum exposure(s) that could be anticipated in the workplace.
- Data from industry-wide surveys by trade associations for member use, and stewardship programs operated by manufacturers for their customers, are often useful in assisting employers (particularly small-business owners) to obtain information on employee exposures in their workplaces.
- Variation - You should account for potential variation in exposure by using exposure data collected using a method that recognizes exposure variability, or by using worst-case assumptions and estimation techniques to evaluate the highest potential employee exposure levels. The use of safety factors may be necessary to account for uneven dispersion of the contaminant in the air and the proximity of the worker to the emission source.

If adequate information is not available to assess exposure potential, air monitoring is required. If air monitoring is justified, sampling parameters and pertinent exposure data shall be recorded.

Copies of air monitoring records shall be maintained in project files and in employee records. Re-evaluations will be necessary when process or task changes are made. Selection of appropriate respiratory protection devices will be accomplished using a hazard assessment. The hazard assessment process will include the following:

- Identify the processes, equipment and chemicals or substances that may create an exposure hazard.
- Determine the oxygen content of the atmosphere and the airborne concentration of the particulate, vapor, or gaseous contaminants suspected of causing employee overexposure.
- The potential for engineering or administrative controls to maintain exposures below acceptable limits.
- The estimated average, maximum and peak potential exposure expected during normal operations. Compare these results to the applicable exposure limits of the ACGIH, OSHA and/or NIOSH.
- Determine if the contaminant has adequate warning properties.
- Determine if the substance presents a skin or eye hazard. If so, additional precautions, such as the use of gloves or chemical resistant clothing and face shield may be required.
- Determine the type of respiratory protection required for the specific operation and other applicable PPE based on the air monitoring results.
- The monitoring frequency of impact substances shall be based on changes in process or task, substances involved, and will include specified monitoring schedules where required by OSHA standards.

Respirator Decision Logic Sequence

After completion of the exposure assessment and evaluation of the task specific information the assigned protection factor (APF) for the recommended respiratory protective device, as listed in the following table, will be used in the following equation to determine a Maximum Use Concentration (MUC).

APF x (PEL or REL or TLV [whichever is lower]) = MUC
PEL = Permissible Exposure Limit (OSHA)
REL = Recommended Exposure Limits (NIOSH)
TLV = Threshold Limit Value (ACGIH)
MUC = Maximum Use Concentration

For each contaminant, the most conservative established value - PEL, REL or TLV - will be used in the equation. OSHA has published a Respirator Decision Logic Tree which may be

helpful in selecting the proper respirator. The Decision Logic Tree may be found on line at the OSHA website: http://www.osha.gov/SLTC/etools/respiratory/decisionlogic/flowcharti.html

APR type respirators may only be used in conditions where airborne concentrations of contaminants do not exceed the MUC or specified cartridge limitations. In addition, APRs are prohibited from use in IDLH conditions and oxygen deficient environments.

Information used to support the selection of respiratory protective devices will be documented in project files.

Cartridge/Canister Change-out Schedule

A cartridge's useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including environmental conditions, breathing rate, cartridge filtering capacity, and the concentration of contaminants in the air as determined by the exposure assessment. Safety factors will be incorporated into the service life estimate to assure that the change schedule is a conservative estimate.

Cartridge/canister change schedules will be based on available data or information and documentation of the method used will be retained in the project file. If the chemical identity and exposure level are known, then an estimated respirator cartridge service life can be prepared and safety factors applied. Cartridge service life may be estimated in one of three ways.

1. Conduct Experimental Tests – This is the most reliable and accurate method and can be used to validate an existing change schedule; however it takes time and money.
2. Use the Manufacturer's Recommendation – This method results in an accurate estimate for a particular brand, but manufacturer recommendations are not available for all applications. The recommendation may not account for all workplace and user factors adequately.
3. Use a Mathematical Model – Mathematical Models are inexpensive and require little time. They generally produce conservative service life estimates and are generally limited to a single contaminant situation. OSHA provides a downloadable tool and the "Advisor Genius" for calculating contaminant breakthrough time for an activated carbon respirator cartridge using physical and environmental parameters specific to the contaminant and the workplace. These tools and other mathematical model assistance for establishing cartridge change schedules for organic vapors can be found at: http://www.osha.gov/SLTC/etools/respiratory/advisor_genius_wood/advisor_genius.html

Experimental work can allow for a generalized estimate or "rule of thumb" that broadly defines the service life of cartridges exposed to chemicals. One such Rule of Thumb for estimating

organic vapor cartridge service life is found in chapter 36 of the American Industrial Hygiene Association publication "The Occupational Environment – Its Evaluation and Control."

It suggests that:

- If the chemical's boiling point is > 70 ° Celsius and the concentration is less than 200 parts per million you can expect a service life of 8 hours at a normal work rate.
- Service life is inversely proportional to work rate.
- Reducing concentration by a factor of 10 will increase service life by a factor of 5.
- Humidity above 85% will reduce service life by 50%
- These generalizations should only be used in concert with one of the other methods of predicting service life for specific contaminants.

Reliance on odor thresholds and other warning properties will not be permitted as the *primary* basis for determining the service life of gas and vapor cartridges and canisters. OSHA emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presence of other potential interfering chemicals in the workplace can all have a serious effect on the effective service life of an air-purifying cartridge or canister.

Medical Evaluation

Prior to assignment of tasks requiring the use of a respirator, employees will be medically evaluated in accordance with the requirements of 29 CFR 1910.134(e), including completion of the Mandatory Appendix C: OSHA Respirator Medical Evaluation Questionnaire. Such evaluations will include work history, medical questionnaire, physical exam and pulmonary function tests and other tests as deemed necessary by the occupational physician.

The employee will be provided opportunity to discuss the results of the medical review with the occupational physician. The medical questionnaire and examination will be administered confidentially and resulting medical records maintained in confidential record files.

Fit Testing

Improper respirator adjustment and fit will negate all the efforts provided in assuring employee protection. The face-to-face piece seal between the respirator and the wearer must be maintained at all times to ensure maximum respiratory protection.

There are two primary conditions that must be met in respirator fitting. These are choosing the proper size face piece for the individual and ensuring that the wearer knows when the proper fit is attained. These can best be achieved by means of a fit test which is required by this respiratory protection program and OSHA.

The basic requirement of fit testing is that the wearer be allowed to determine the seal in a test atmosphere. It is important to remember that during this test the wearer must adjust the straps to a comfortable point. Tightening the straps beyond this may decrease leakage, but can make the respirator unbearable to wear.

Each time a respirator is donned, the wearer should conduct a quick fit check. This ensures the respirator is adjusted properly and sealed against the face. The advantages are that the wearer can do this alone in the field and the test can be repeated any time the seal is in question. There are two types of quick fit checks, the negative fit check and the positive fit check.

- Negative Pressure Check - Close off the air inlet opening(s) of the mask with the palm of your hand. Inhale gently so that a vacuum occurs inside the mask. Hold your breath for 10 seconds. If the vacuum remains and no inward leakage is detected, the respirator is properly sealed.
- Positive Pressure Check - Close off the exhalation valve with your hand. Breathe gently into the mask. The face piece seal is satisfactory if some pressure can be built up inside the mask without any air leaking out between the mask and the face of the wearer.
- If leakage is detected during either quick fit check, the straps should be readjusted, and the check repeated.

On a minimum annual basis (or more frequently if required by regulation) a more stringent fit test shall be conducted. This can be either a quantitative or qualitative fit test. Annual employee fit test records shall be updated annually as amendments to the APP.

Qualitative Fit Testing

General respirator use warrants qualitative fit testing. Qualitative fit testing will be performed for any respirator use at the former Fort Ord project site. This should be conducted prior to entering a contaminated atmosphere and is especially prudent if respirator use is infrequent. It involves exposing the wearer to a test agent that can be easily detected by odor, irritation, or taste. If an APR is being tested, the proper cartridge must first be chosen. If the wearer is unable to detect the test agent upon exposure, then the respirator is considered to have a proper fit. If a sensation or smell (depending on the test challenge agent) is detected upon exposure, then the fit is adjusted or another face piece size/ respirator manufacturer is chosen.

The following procedures should be followed in selecting a respirator for fitting.

- The subject should understand that they are being asked to select a respirator that it is the most comfortable for them as they may have to wear the unit for extended periods. Each respirator represents a different size and shape, and if fitted properly, will provide adequate protection for the anticipated conditions.

- The subject should be allowed to select the most comfortable respirator from three sizes and two manufacturers.
- The subject should hold the unit up to the face and eliminate those which will obviously not fit.
- The subject should be shown how to put on the respirator, how to position it on the face, how to adjust the strap tension and how to assess a comfortable fit. A mirror may aid the subject in evaluating the positioning and fit of the mask.
- After the most appropriate respirator has been chosen, it should be donned and worn for at least five minutes to assess comfort. If the subject has never worn a respirator before the donning procedure should be repeated to ensure ease of handling and adjustment.
- Assessment of comfort should include the following:
    - chin positioned in the mask properly
    - positioning of the unit on the nose
    - strap tension
    - fit across the bridge of the nose (if a half-mask)
    - room for safety glasses (if a half-mask)
    - distance from the nose to the chin
    - ability to talk
    - tendency of the unit to slip
    - cheeks “puffed out”
    - adequate time for assessment has been allowed.

The subject is now ready for the quick fit checks described above and should seat the mask by moving the head rapidly from side to side and taking a few deep breaths.

The following procedures shall be implemented in conducting the qualitative fit test.

- The test should be conducted in a specially designed hood hung above the subject’s head to surround them and contain the test atmosphere or a similar enclosure in a well-ventilated room to maintain the test atmosphere and prevent the test administrator from continually being exposed to the test agents. This also prevents exposing test subjects to the agents prior to testing causing sensory fatigue/recall during testing.
- Use of common agents available from the respirator supplier, such as isoamyl acetate (banana oil). When fit testing APRs, organic vapor cartridges are required

for the banana oil test. However it is important to replace these elements with ones designed to remove the contaminants in the work setting following the test.

- After selecting, donning and properly adjusting the respirator, the subject shall wear the unit into the chamber and be provided with a copy of the following instructions.

Test Exercises

- Normal breathing.
- Deep breathing. Be certain breaths are deep and regular.
- Turn the head from side-to-side and inhale at each side. Be certain motions are complete and assertive. Do not bump the respirator on the shoulders.
- Nod the head up-and-down with complete determined motion and inhale while head is up. Do not bump the respirator on the chest.
- Talk aloud and slowly for several minutes. The following passage known as the "Rainbow Passage" can be used and is designed to simulate the majority of potential facial movements during speech. Other passages can be used which will serve the same purpose. (ex: "When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long arch, with its path high above the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one has ever found it. When a person looks for something beyond their reach, friends say they are looking for the pot of gold at the end of the rainbow.")
- Normal breathing.
- Each subject shall wear a respirator for at least 10 minutes before starting the fit test.
- Upon entering the test chamber the subject is informed of the reasons for the fit test, the test procedures and demonstrations. In the meantime, the banana oil is introduced by ampoule or a treated paper towel allowing the vapors to fill the chamber.
- The exercises in number 3 above are now performed for at least one minute. If irritant smoke is used as the test agent, then it is introduced by squeeze bulb at this time. The smoke should be directed at the face-to-face piece seal of the respirator.
- If at any time during the test, the subject detects the banana odor or has an involuntary sensation to cough, they shall exit the chamber and leave the area with the respirator on to avoid sensory fatigue.
- The subject shall then remove the respirator and do one of the following:
    - adjust the fit of the current unit,
    - try another size,

- o try another brand.

- These actions shall be repeated, in order, until a satisfactory fit is obtained.
- It may be necessary for the subject to wait 5-10 minutes before repeating the test to ensure odor sensitivity has returned.
- Once the subject passes the test, the fit can be demonstrated by breaking the face-to-face piece seal in the chamber and allowing the subject to experience the odor/sensation.
- Employees who have passed this test procedure and obtained a satisfactory fit can be assigned a protection factor of no greater than 10 with the test respirator. This means that the unit shall not be used in atmospheres where the contaminant concentration exceeds 10 times the PEL.

Each time a qualitative fit test is conducted, a Fit Test Record form will be completed and a copy placed into the employee's training files.

Quantitative Fit Testing

For the former Fort Ord project site, it is not anticipated that Quantitative Fit Testing will be conducted. If Level A or B respiratory protection is conducted at the former Fort Ord project site, then personnel that will don Level A or B respiratory protection will be quantitatively fit tested.

Procedures for Proper Use of Respirators

Employees whose work assignments require the use of respiratory protective equipment will be trained in the proper use of the equipment. The procedures for proper use of respirators will be provided at initial training, during annual refresher training, and during daily safety briefings. Training will include all items listed in this program. Procedural training will include details of this respiratory protection program, and any project specific requirements listed in the SSHP.

Inspection, Maintenance and Care of Respiratory Protective Equipment

Compressed breathing air cylinders shall be inspected monthly for wear, cracks, or dents. Cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level.

SCBAs, air compressors and booster pumps utilized for breathing air shall be inspected annually andSCBA Monthly Inspection Checklist should be amended each month to document that each individual SCBA is fit for operation. Annual inspection and servicing of breathing air equipment shall be conducted by qualified personnel.

The maintenance and care of all respirators (other than disposable units) will normally be performed by the employee to whom the device is assigned. The employee must identify any

damaged or defective respiratory protection equipment immediately, contacting the SSHO/UXOSO. The SSHO/UXOSO will ensure that the respiratory equipment is promptly repaired or replaced.

The SSHO/UXOSO will coordinate with the CSHM to ensure adequate funding is allocated for acquisition and maintenance of respiratory protective supplies.

Each respirator will be inspected by the employee before each use. Respirator inspection will include:

- Assuring that the type of equipment and its associated parts are adequate and appropriate for the contaminant(s) and concentration.
- Checking that the following are working properly and in good condition:
    1. Valves
    2. Face piece seal
    3. Head straps
    4. Cartridge fit
    5. Hoses
    6. Connections on all hoses
    7. Cartridge retainer gaskets
    8. Battery for PAPR

Cleaning, Disinfection and Storage

Respirators will be decontaminated after each use where there has been entry into a contaminated environment, such as a hazardous material work area. Respirators should be cleaned after each use.

Cleaning Negative Pressure Respirators:

- Remove the cartridges and headbands and disassemble all respirator parts.
- Wash all respirator parts (except cartridges and elastic headbands) in a cleaner-disinfectant solution or use soap and water. The water should be warm but not hot. Use a hand brush if the respirator is exceptionally dirty.
- Rinse completely in clean, warm water.
- Air-dry in a clean area.
- Inspect all parts. Any defective parts must be replaced before entering the work area.

- Re-assemble the respirator and place it in a clean plastic bag and seal it for storage.

Disposable wipes or washing solutions will be made available for cleaning respirators. The cleaned respirator must be stored in a clean, sealed plastic bag dedicated for respirator storage.

Breathing Air Supply Procedures

For the former Fort Ord project site, it is not anticipated that Air Supplying Respirators or Breathing Air Supply will be utilized.

Training

Initial and annual refresher training will be provided to all employees who are assigned respiratory protective equipment. Additional training for the former Fort Ord project site specific tasks will be conducted by the SSHO/UXOSO during daily safety briefings.

Employees assigned APRs will be trained using the follow outline:

1. Identify the limitations of APRs
2. Recognize eight limitations to the use of air purifying respirators.
3. Recognize how to select an appropriate air purifying respirator.
4. Identify the operating principles of positive pressure, self-contained breathing apparatus.
5. Demonstrate the donning and doffing and servicing of a self-contained breathing apparatus.
6. Identify the operating principles of APR's. An APR selectively removes contaminants by:
7. Filtration
8. Absorption
9. Adsorption
10. Chemical Reaction
11. The cartridges used for contaminant removal are product or chemical group specific.
12. Title 29 CFR 1910.134 specifies a standard color code for APR cartridges.
13. The user should refer to cartridge labeling for specific information regarding applicability for a specific product and concentration.

- Air purifying respirators may be negative pressure devices.
    - Air flow through the cartridge results from the negative pressure created inside the face piece on inhalation.

  - Negative pressure respirators such as a full face purifying respirator provide a lower protection factor than a positive pressure self-contained breathing apparatus.
  - Personnel wearing negative pressure APRs must be fit-tested in accordance with the appendices to Title 29 CFR 1910.1001, 1025, or 1028.

- Air purifying respirator cartridges have no end of life warning. The end of life is indicated by:
  - BREAKTHROUGH: The product may break through the cartridge filtration media and permit entry into the face piece.
  - LOADUP: The cartridge may load up (become plugged) with contaminated moisture or dirt making breathing more difficult.
- Recognize respiratory hazards and limitations to the use of APRs
  - Atmospheres which are IDLH. OSHA defines IDLH as "an atmospheric concentration of any toxic, corrosive or asphyxiate substance that poses any immediate threat to life or would cause an irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.
  - Oxygen deficient atmospheres.
    - OSHA defines oxygen deficiency as less than 19.5% oxygen by volume in the atmosphere.
- Unknown products.
  - In that air purifying respirators are product or product group specific, it is essential that potential contaminants be identified prior to selection.
- Unknown concentrations.
  - Air purifying respirator cartridges are suitable for a specific concentration range; if the concentration exceeds this range protection will be compromised.
- A concentration of a known substance which exceeds the protective capability of the cartridge.
- Products which present a health risk at concentrations below their odor or taste threshold.
  - These products have poor warning properties.
  - This is critical as air purifying respirator cartridges have no end of life warning other than load up and breakthrough.
- High moisture concentration which may cause excessive load up.

- Unavailability of the proper cartridge
  - Cartridges are product or chemical group specific.
  - Cartridges made by different manufacturers may not be interchanged.

10.5 Health Hazard Control Program

The hazards for the site and related tasks are addressed in the KEMRON Site Safety and Health Plan (SSHP) for former Fort Ord which is included in Appendix A. AHAs documenting the hazard analysis and evaluation of site specific tasks are included in the SSHP. The SSHO/UXOSO will update the AHAs when site conditions or potential hazards change. Updated AHAs will be reviewed with all site employees during the daily tailgate safety meeting.

10.6 Lead Abatement Plan

Lead Based Paint abatement activities are not associated with the tasks to be performed under the scope of this contract.

10.7 Asbestos Abatement Plan

Asbestos abatement activities are not associated with the tasks to be performed under the scope of this contract.

10.8 Radiation Safety Program

Project tasks may include the use of an electromagnetic radiation machine for analysis of potential MEC including radium dials. KEMRON will obtain and implement a site specific Radiation Safety Program in the event radiological waste is encountered. When there are any radiation devices utilized at a project site the following procedures will be implemented.

- All site operations involving radiation hazards or equipment will be conducted under the direct supervision of a trained Radiation Safety Officer (RSO). Mr. Leland Meadows, Certified Hazardous Materials Manager (CHMM) of KEMRON, will serve as the RSO, or may designate an onsite RSO that is qualified per the requirements for an RSO as found in EM 385-1-1, Section 06.E.02. The RSO and associated training certifications/qualification will be provided to the CESPK Fort Ord COR prior to any tasks where radiation hazards exist or equipment is utilized. Training certifications will also be maintained onsite.
- Manufacturer trained personnel are required to operate, transport, or store such devices;
- Appropriate PPE will be worn at all times. PPE levels will be designated by the device manufacturer and/or the SSHO/UXOSO;

- Radiation dosimeters will be used to monitor operating personnel and site background levels;
- Radiation devices will be stored in a safe and secure location when not in use; and
- Emergency protocols for broken or damaged devices will be established by the SSHO/UXOSO according to manufacturer's recommendations.

10.9 Abrasive Blasting Plan

Abrasive blasting activities are not associated with the tasks to be performed under the scope of this contract.

10.10 Crystalline Silica Monitoring Plan (Assessment)

Crystalline Silica activities are not associated with the tasks to be performed under the scope of this contract.

10.11 Confined Space Plan

Work within a confined space is not anticipated under the scope of this contract.

10.12 Hazardous Energy Control Plan (Lockout/Tagout)

The purpose of the LOTO Program is the control of hazardous energy to prevent injury and property damage from the accidental energizing of equipment and electrical circuits or production of another type of hazardous energy from an unexpected source while such equipment or circuits are being serviced by employees or contractors. This program establishes the requirements for isolation of potential hazardous energy sources, including electrical, chemical, thermal, kinetic, potential, hydraulic, pneumatic and gravitational energy prior to equipment repair, adjustment or removal. Reference: OSHA Standard 29 CFR 1910. 147 (the control of hazardous energy).

This procedure will be followed by any employee when that employee's duties include performing service or maintenance of machines and equipment in which the unexpected energizing or start-up of the machines or equipment, or release of stored energy could cause injury to employees. This includes but is not limited to: electrically powered, steam powered, pneumatic, and hydraulic equipment. KEMRON contractors will also follow this procedure when duties include servicing or maintenance of machines or equipment.

Hazards

Improper or failure to use LOTO procedures may result in:

- Electrical shock

- Chemical exposure
- Thermal & chemical skin burns
- Lacerations & amputation
- Crush injuries
- Fires & explosions
- Chemical releases and exposure
- Eye injury
- Death

Hazard Controls

- Only authorized and trained employees may engage in tasks that require use of lockout-tagout procedures
- Lockout procedures have been developed for all equipment and processes
- Restoration from Lockout is a controlled operation

Definitions

Authorized Employees are the only ones allowed to lock and tagout equipment or machinery. Whether an employee is considered to be authorized to operate or shut down equipment will depend upon various circumstances in the workplace. An individual may be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered to be "qualified" to be considered authorized for the performance of those duties.

Affected Employees are those employees who operate machinery or equipment upon which lockout or tagging out is required under this program. Training of these individuals will be less stringent in that it will include the purpose and use of the lockout procedures.

Other Employees are identified as those that do not fall into the authorized, affected or qualified employee category. Essentially, it will include all other employees. These employees will be provided instruction in what the program is and not to touch any machine or equipment when they see that it has been locked or tagged out.

Block - Isolation of a process line to prevent the movement of energy past the isolation point. Examples are the closure of a valve, installation of a blank flange, blocking the press die.

Bleed - Eliminating the stored energy downstream of a process block. Examples are opening a downstream vent valve, gagging a relief valve open, discharging electrical capacitors.

Energy Isolating Device - A mechanical device that physically prevents the transmission or release of energy including, but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a line valve; a block; and any similar device used to block or isolate energy.

Energy Source - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other hazardous energy.

Lockout - The placement of a lockout device on an energy isolating device, in accordance with established procedures,ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Safety Lock - Distinctively identifiable locks used for securing energy isolating devices. The safety lock is used for "lockout" only. An acceptable lockout device utilizes a key or combination to hold the energy isolation device in a safe position.

Servicing and/or Maintenance - Workplace activities such as, constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment.

Tagout - The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed. An acceptable tagout device is a warning tag, standardized in color, size, and wording (e.g. DO NOT START; DO NOT ENERGIZE; DO NOT OPEN; etc.), which is chemical and weather resistant.

Conditions which require LOTO

29 CFR 1910.147 - "The Control of Hazardous Energy (LOTO)" covers the servicing and/or maintenance of machines and equipment.

Situations which would require LOTO in order to prevent injury to employees include:

a. Potential for the unexpected energizing or start-up of the machinery or equipment.
b. When there may be a release of stored energy in machinery or equipment.

Types of Hazardous Energy Sources

1. Mechanical energy can be in the form of potential or kinetic energy.
2. Potential energy is associated with the mass of a body and its height.
3. When a body mass is taken out of its "resting" position and held in a "tensioned" position.

4. Potential exists that this body mass can be released and the energy that will be released is the potential energy.
5. Kinetic energy is associated with the mass of a body and its speed. Kinetic energy is often referred to as the "Energy of Motion".
6. Examples of hazardous potential energy sources are:
7. A press not lowered to its "at rest" position.
8. A compressed gas line which has not been bled.
9. A car on a jack stand.
10. A valve held open by a mechanical trip latch.
11. Examples of hazardous kinetic energy sources are:
12. A rotating saw blade.
13. A spinning motor, pump, turbine or fan.
14. A conveyor belt

Electrical Energy

Electricity is present in virtually every industrial, manufacturing, office and home environment. Electrical energy is the energy source that powers equipment, computers and lights to which we are all accustomed. It is invisible, odorless, and colorless. Electrical energy cannot be detected by normal body senses unless we come in close contact with, or touch it.

Electrical current coming in contact with the body can cause uncontrolled muscle contraction, failure of the respiratory system, vital organs (heart), or severe burns. Some electrical components, such as capacitors, store energy, and must be discharged prior to commencing work. Many electrical devices have more than one source of power.

Examples of Equipment that uses Electrical Energy:

- Motors
- Fans
- Programmable Logic Controllers
- Electric Heaters
- Compressors
- Generators

Hydraulic Energy

Hydraulic energy is energy associated with a fluid (water, oil) under pressure. Hydraulic energy is used to operate heavy machinery or remote components.

Examples of Hydraulic Energy:

- Fork lifts
- Automotive power steering systems
- Valve operators
- Front-end loaders
- Car lifts
    - Airplane flaps

Pneumatic Energy

Pneumatic energy is the energy associated with pressurized (compressed) air.

Examples of Pneumatic Energy:

- Air bottles for SCBA
- Air in tires
- Air operated valves or actuators
    - Air compressor receivers and storage tanks

Chemical Energy

Corrosive and/or irritant chemicals may destroy body tissues. Toxic materials may cause acute or chronic physiologic effects. Flammable and/or combustible materials are potential fire hazards.

Thermal Energy

Thermal energy pertains to the presence or absence of heat - and the hazards associated with either condition.

Examples of Thermal Energy Sources:

- Steam
- Fire
- Heaters
    - Liquid nitrogen, helium, and Carbon Dioxide (CO_2)

Protective Materials and Hardware

Protective materials and hardware that might be required to perform LOTO procedures:

- Locks
- Tags
- Chains
- Wedges
- Key Blocks
- Adapter Pins
- Self-Locking Fasteners
- Flange Blanks

Lockout and tagout devices will be:

- Durable - environmentally sound
- Standardized - color, shape, size
- Substantial - prevent removal
    - o Identifiable - identify employee applying the device, warning statement, legend (DO NOT REMOVE, DO NOT OPEN, DO NOT START, etc.)

Lockout/Tagout (LOTO) Procedure for an Authorized Employee

- The following steps and actions will be done in sequence. Information must be recorded on the LOTO Permit.

Preparation for shutdown

- Identify type and magnitude of energy.
- Identify hazards of energy to be controlled.
- Identify energy control methods.

Shutdown

- Effect an orderly shutdown using standard operating procedures.
- An improper shutdown may introduce additional hazards.

  Verify that affected employees are notified in advance of the shutdown.

Isolation

- All energy isolation devices are physically located and operated to isolate energy sources.

Lockout or Tagout Devices Applied

- The authorized employee will affix lockout and/or tagout devices to all energy isolating devices. If a lockout system can be used, this method will be selected. If the energy system cannot be locked out, a tagout device will be employed.
- A lockout device will be attached to hold the energy isolating device in the "safe" or "off" position.
- Tagout devices will be placed in such a manner that clearly indicates that any operation or movement of the energy isolating device is PROHIBITED.
- Place tagout device in lockout device location, if so equipped.
- If tag cannot be affixed directly to the energy isolating device, locate the tag as close as safely possible to be immediately obvious.

Stored Energy

- All potentially hazardous stored (or residual energy) is relieved, disconnected, restrained, or otherwise rendered harmless.
- Verification of isolation will continue if the possibility of energy accumulation is present.

Verification of Isolation

- Before starting work, verify that the isolation of energy is effective. This may be performed by operating the equipment's "start" switch or other normal operating controls to ensure the equipment will not operate.
- Check electrical circuits with measuring devices to assure absence of voltage. Observe indications of other parameters.
- Always return operating controls to the "neutral" or "off" position after this test.

Extended Lockout - Tagout

Should the shift change before the machinery or equipment can be restored to service, the lock and tagout must remain. If the task is reassigned to the next shift, those Employees must lock and tagout before the previous shift may remove their lock and tag.

Table 10-1 Sequence of Events

Authorized Employee	Obtain LOTO permit Observe equipment looking for specific hazards. Completes Sections 1, 2 and 3 of LOTO permit. Signs Section 4 of LOTO permit Takes completed LOTO permit to SSHO/UXOSO and PM
SSHO/UXOSO	Reviews LOTO form. If complete, SSHO/UXOSO and PM signs LOTO form. If incomplete SSHO/UXOSO and PM returns form to authorized employee for completion. Signs and issues completed LOTO form.
Authorized Employee	Notifies Affected Employee of work. Examines area ensuring that deenergizing will create no hazard. If the machine or equipment is operating, shut it down by the normal stopping procedure (push-button, switch, etc.) De-activate the energy isolating device so that the machine or equipment is isolated from the energy source(s). Lockout the energy isolating device with assigned individual lock. Stored or residual energy must be dissipated or restrained by grounding, blocking, repositioning, etc. Ensure that the equipment is disconnected from the energy source by operating the normal operating control in a safe manner. Be sure to turn control back to the off position. The machine or equipment is now locked out. Performs "tryout" to ensure zero energy level. Begins work. Completes task. Seeks Supervisor's approval.
Supervisor	Approves work done
Authorized Employee	Notifies supervisor that equipment is to be energized
Supervisor	Clear area and orders authorized employee to energize

Requirements for Using Group Lockout/Tagout (LOTO)

a. The level of protection for a group performing work must be equal to that afforded to an individual performing work.

b. The following steps will be followed when a crew, department or other group is involved in work.

- Each authorized employee will place their personal lockout device on the group energy isolation device.
- A multiple lockout may be used to accept more than one lock if needed.
- For lockouts, a single lockout may be used with the key being secured in a lockout box, or, cabinet which allows for multiple locks. Each employee will secure their lock to the SSHP on the lockout box, or cabinet. As an employee completes their work, their authorized locking device will be removed from the key box, or cabinet, multiple SSHP.
- No one will begin work until the supervising individual deems the lockout is complete and work may safely begin.
- The supervisor is responsible for ensuring all personnel are clear of the equipment.
- The supervisor is also responsible for ensuring all steps of the lockout procedure are complete.

Temporary Removal of Lockout/Tagout (LOTO)

Should temporary removal of LOTO devices be required, the following mandatory procedures will be followed in the order listed.

- The supervisor will assure that all tools have been cleared from the area.
- The supervisor will remove all affected employees from the area.
- Authorized employee(s) performing the maintenance activity will remove his/her LOTO device(s).
- The supervising authorized employee will energize and proceed with testing.
- The supervising authorized employee will de-energize and authorized employees performing the maintenance activity will reapply control measures and verify isolation before proceeding.

Release from Lockout/Tagout (LOTO)

a. The authorized employee who initiated LOTO will inspect the area to ensure the machine or equipment serviced is free from tools and other items that may interfere with proper operation. Verify all machine guards are replaced properly and secured.

b. The authorized employee will ensure all affected and other employees are safely positioned or removed from the area.

c. Removal of LOTO devices

- Each LOTO device is to be removed by the employee who applied the device.
- If the employee who applied the device is unavailable (off-site) and cannot be contacted, only an employer - authorized person may remove the device after personally assuring that it is safe to do so.
- The authorized employee must be made aware of the device removal before resuming work at the facility.
- Check the work area to ensure that all employees have been safely positioned or removed from the area.

Verify that the controls are in neutral.

- Remove the lockout devices and reenergize the machine or equipment. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

Steps That Will Be Used by the SSHO/UXOSO to Audit This Procedure

The lockout procedure will require authorized employees to submit a completed lockout permit to the SSHO/UXOSO.

Upon completion of service or repair, the form will be returned to the Health & Safety Officer. This will allow the SSHO/UXOSO to review forms and see that all work that requires LOTO utilizes LOTO. At least annually, the LOTO program will be reviewed and an inspection performed of an actual LOTO in progress to ensure procedures and requirements are being followed.

Training

Energy isolation and LOTO are to be applied by trained employees authorized to perform service or maintenance.

Personnel to be Trained and Timing

a. Training will be provided to employees affected by the energy control program.

b. Retraining will be provided as follows:

- Retraining will be provided for all authorized employees and affected employees whenever there is a change in their job assignments; a change in machines, equipment, or processes that presents a new hazard; or when there is a change in the energy control procedures.

- Additional retraining will also be conducted whenever a periodic inspection under 29 CFR 1910.147(c)(6) reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.
- The retraining will reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

c. When tagout systems are used, employees will be trained in the limitations of tags set forth in "Topics to be Covered"

Topics to be covered

The training will ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of energy controls are acquired by employees. The training will include the following:

a. Each authorized employee will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

b. Each affected employee will be instructed in the purpose and use of the energy control procedure.

c. All other employees whose work operations are or may be in an area where energy control procedures may be utilized, will be instructed about the procedure, and about the prohibition relating to attempts to restart or energize machines or equipment that are locked out or tagged out.

d. When tagout systems are used, employees will also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy-isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy-isolating device, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

- Tags must be securely attached to energy-isolating devices so that they cannot be inadvertently or accidentally detached during use.

Recordkeeping Requirements

Documentation of employee training will be maintained, certifying conformance to current regulatory and KEMRON requirements. The certification will contain each employee's name, signature, trainer signature, and dates of training.

10.13 Critical Lift Procedures (Cranes)

Critical lifting activities are not associated with the tasks to be performed under this contract.

10.14 Contingency Plan for Severe Weather

All personnel must be aware of the possibility for severe weather, such as thunderstorms, lightening, high winds, rain, and tornados. KEMRON employees, subcontractors, and site visitors must know the correct exits to use from all areas of the site and emergency assembly locations. Necessary precautions will be taken in the event of severe weather which shall be coordinated by the SSHO/UXOSO. Local weather shall be monitored by the SSHO/UXOSO during suspected occurrences of severe weather in order to communicate with site personnel prior to the initiation of severe weather events.

In the event of severe weather, the following procedures will be followed:

- All personnel shall shut down field operations and take shelter in a vehicle or permanent structure;
- Upon notification that an evacuation is in progress, all company personnel and visitors will immediately use the nearest available exit and/or stop and proceed to their designated assembly location for a head count by the SSHO/UXOSO.
- If lightning is occurring, stop outdoor work and move indoors, or stay inside a vehicle. Shut down and move away from heavy equipment.
- In the event of tornado conditions, seek out low ground such as a ditch or basement, and shield yourself from falling objects.
- All outdoor activities will be suspended for 30 minutes following thunderstorms and lightning producing weather events.

It is important to recognize that all severe weather events are not the same and the use of accepted practices, common sense and good judgment may be required. Therefore, site personnel must be cognizant to changing situations and be ready to adapt to potential emergency situations.

10.15 Float Plans

Work above or adjacent to water is not associated with the tasks to be performed under this contract.

10.16 Access and Haul Road Plan

KEMRON will use the established roads on the former Fort Ord for access routes. Site vehicles will be operated by KEMRON, subcontractor's personnel and vendors using safe driving and parking practices.

Advance notifications will be made before any extraordinary activity, such as chemical handling or shipment, road closures, or hauling of contaminated materials on public roads is conducted. These notifications include:

- Notification to the BRAC Community Relations Manager, who will determine the need for notification to the general public.
- Notification to the POM Fire Department for any activity where there is a potential need for rescue personnel.
- Notification to agencies and organizations potentially affected by road closures or detours.

The list of notifications will be identified in the site-specific work plan.

Attention will be paid to the potential impacts of activities on nearby residences, businesses, and especially schools. To the extent possible, traffic will be routed to avoid schools. As necessary, work may be conducted when schools or other businesses are closed.

10.17 Demolition Plan (Engineering and Asbestos Survey)

Structure demolition activities are not associated with the tasks to be performed under this contract.

10.18 Emergency Rescue (Tunneling)

Tunneling emergency rescues activities are not associated with the tasks to be performed under this contract.

10.19 Underground Construction Fire Prevention and Protection Plan

Underground construction activities are not associated with the tasks to be performed under this contract.

10.20 Compressed Air Plan

Compressed air use activities are not associated with the tasks to be performed under this contract.

10.21 Formwork and Shoring Erection and Removal Plans

Formwork and shoring activities are not associated with the tasks to be performed under this contract.

10.22 Lift Slab Plans

Slab lifting activities are not associated with the tasks to be performed under this contract.

10.23 SHP and SSHP

The Site Safety and Health Plan is included as Appendix A.

10.24 Blasting Plan

Blasting activities may be conducted if MEC is encountered during the former Fort Ord Project and include blown in place (BIP) or consolidate disposal by detonation. All BIP operations and consolidated disposal by detonation will be conducted in accordance with the former Fort Ord Explosive Safety Plan (ESP).

10.25 Diving Plan

Diving activities are not associated with the tasks to be performed under this contract.

10.26 Plan for Prevention of Alcohol and Drug Abuse

This program establishes KEMRON's policy of maintaining a drug-free workplace, and provides procedures for substance screening and detection in KEMRON employees. The substance free workplace program has been established out of a commitment to employee safety and health, productivity, and accident prevention. This program applies to all personnel and covers employees of contractors and subcontractors. All contractors and subcontractors are informed of the drug-free workplace and substance detection program and are responsible for compliance with and administration of the program.

It is KEMRON's policy to establish and maintain a drug-free workplace. The unlawful manufacture, distribution, dispensing, possession, or use of narcotics, drugs, alcohol or controlled substances while on the job or on company property is prohibited. Employees will be subject to disciplinary action, up to and including termination of employment, for bringing illegal, non-prescribed drugs, narcotics, or alcoholic beverages to work; being under the influence of such substances while working; using them while working; or dispensing, distributing, or illegally

manufacturing or selling them on company premises and work sites. Employees, their possessions, and company-issued equipment and containers under their control are subject to search and surveillance at all times while on company premises or while conducting company business.

Over the counter drugs and drugs prescribed by a physician for an employee's personal use within the last 12 months from the date of drug testing and in quantities not exceeding reasonable or specified dosage requirements are not subject to this policy. Any employee who is taking medication prescribed by a physician must be able to provide a record of the prescription, including the name of the medication, the prescribing physician's name, the reason it was prescribed, and any limitations the prescription may place on the employee's ability to perform assigned duties.

Management Responsibilities

KEMRON corporate management is responsible for: establishing an ongoing drug-free awareness program to inform KEMRON employees of the dangers of drug abuse in the workplace; implementing KEMRON's policy of maintaining a drug-free workplace; assuring conformance to KEMRON's Corporate Environmental, Health and Safety Manual drug-free workplace program. KEMRON regional management at each operating location is responsible for notifying each employee of this program and KEMRON's procedures for establishing and maintaining a drug-free workplace.

KEMRON Project and Site managers are responsible for informing employees working on KEMRON sites of the requirement for conformance to the drug-free workplace program and the substance detection program. KEMRON Site managers are responsible for evaluating and determining whether FAR 23.5, Drug-Free Workplace requirements are applicable to each project. For those projects subject to FAR 23.5, only those employees who have been tested within 90 calendar days prior to being directly engaged in executing the scope of work and whose test results were negative for the presence of the controlled substances specified by FAR 23.5 will be permitted by the project manager to be directly engaged in executing the scope of work.

Site managers are also responsible for documenting reasonable suspicion and initiating reasonable suspicion or post-accident testing in accordance with company guidelines. The Project Manager will further ensure that any employee determined to have used a controlled substance in violation of applicable law or federal regulation will be prohibited from working on the site or being directly engaged in executing the project scope of work.

Responsibilities of Contractors/Subcontractors

It is the responsibility of contractors and subcontractors to inform their employees of requirements of the drug free workplace and substance testing program and to ensure that employees participate in the program. Where required by contract, contractors and

subcontractors will be subject to all aspects of the drug-free workplace standards of FAR Subpart 23.5. Documentation of employee participation must be maintained by contractors and subcontractors. Within 24 hours of learning that an employee has failed a substance test, contractor and subcontractor management must take action as described in this program.

Responsibilities of Employees

Employees are responsible for compliance with the requirements of this policy and program, and for submission to substance screening during routine physical examinations, if randomly requested, or when requested for reasonable suspicion or post-accident, as scheduled by management.

Further, employees taking non-prescription or physician prescribed medications are responsible for being aware of any potential effect such drugs may have on their reactions, judgment, or ability to perform their duties and if impairment is possible, to report such use to their supervisor prior to reporting to work. Employees must notify the medical attendant present at substance testing of any prescription or over-the-counter medication he/she is currently taking.

Each employee is individually responsible for notifying his/her office's KEMRON regional management in writing within 5 days of being convicted under a criminal drug statute for a violation occurring in the workplace. The regional management will forward this information to the KEMRON Corporate Health and Safety Manager. If applicable, the Health and Safety Manager will provide notice of the conviction to the contracting officer for any federal project in which the convicted employee is working, as required by FAR 23.504(a)(6). Any employee who is convicted under a criminal drug statute for a violation occurring in the workplace will be subject to disciplinary action as described in this procedure.

Recordkeeping

Appropriate records will be maintained on: employee screening at hire; random screening program results; screening for reasonable suspicion or post-accident results; employee information and education programs; employee criminal drug statute convictions for violations occurring in the workplace; and disciplinary procedures for employees who fail to comply with the requirements of this procedure. All such program information will be maintained as confidential and shared only on a need to know basis, to ensure privacy rights of employees. Each employee is required to sign an acknowledgment of KEMRON's Drug Free Workplace and Substance Detection Program indicating receipt of the written program. The signed form will be incorporated into the employee's personnel file.

Prohibitions/Inspections

No employee will report for work or will work impaired by any substance, drug, or alcohol (lawful or unlawful) except with management's approval; such approval will be limited to lawful medications and based strictly on an assessment of the employee's ability to perform his/her

regular or other assigned duties safely and efficiently. Any violation of this program may result in summary discipline, up to and including discharge.

No employee at any work site will possess any quantity of any controlled substance, drug, or alcohol, (lawful or unlawful) which in sufficient quantity could result in impairment, except for authorized substances. Authorized substances include only:

- Lawful over-the-counter drugs (excluding alcohol) in reasonable amounts.
- Other lawful (prescription) drugs or alcohol, the possession of which management has been advised and approved in advance.

Any violation of this program may result in summary discipline, up to and including termination of employment. For purposes of assuring compliance with the above, both applicants for employment and employees may be subject to substance testing under the circumstances described below.

For purposes of assuring compliance with the prohibition of possession, employees may be subject to inspections of the kinds and under the circumstances described below. Any refusal to submit to such an inspection will be treated as an act of insubordination, with attendant disciplinary consequences.

An employee's locker, closet, work area, desk, files, company motor vehicle, and similar areas are subject to inspection at any time, on a random or any other non-discriminatory basis for purposes of this program. Similarly, an employee's own car, lunch box, and the like personal containers are subject to such inspection when brought onto the work site.

Employee Education and Assistance

KEMRON management will assure that each employee receives the appropriate orientation to KEMRON's DFWP program and substance detection procedures. The orientation will include an explanation of the policy and program, responsibilities, and procedures to be followed prior to entry and during assignment on a project where a substance detection program is in place. New employees will be provided DFWP program information within the first six weeks of employment.

Employee education and assistance will include the following.

- Educational awareness of substance issues
- Information about KEMRON's program and policy
- Copy of KEMRON's written policy
- Basic information on alcohol and other drugs, signs, symptoms, effects and dangers
- List of helping resources in the community for professional substance assessment, counseling, and treatment

KEMRON employee assistance for self-referral contact information is as follows:

Danie Penenburgh
Human Resources Manager
KEMRON Environmental Services, Inc.
8521 Leesburg Pike, Suite 175
Vienna, VA 22182
Office (703) 893-4106

KEMRON's human resources manager will accommodate self and supervisory referrals to treatment and/or counseling while maintaining the privacy and confidentiality of the affected employees.

Employees will sign and return an acknowledgement form indicating his/her receipt of KEMRON's policy and orientation.

Supervisor Training

In addition to receiving information provided to employees during DFWP training, supervisors will be trained to identify and address potential drug use including the following:

- Recognizing possible alcohol/drug problems
- Documenting behaviors that demonstrate alcohol/drug problems
- Employee confrontation techniques for observed behaviors
- Initiating reasonable suspicion and post-accident testing

Drug and Alcohol Testing

Each employee who participates in the education program on substance detection will sign a statement, Drug-free Workplace and Substance Detection Program, confirming that he/she has been given the information and understands KEMRON's drug-free workplace program and that pre-employment/new hire, routine, random, reasonable suspicion, and post-accident testing will be required. Failure to pass a drug and/or alcohol test will result in disciplinary action in accordance with the program. The signed statement is included in the individual's departmental personnel file.

The drug and alcohol testing of employees will be determined by KEMRON. KEMRON will cover the financial costs of any drug test required under the program. If the employee requests a retest, the employee is responsible for the cost of such a test. Refusal to submit to testing will be considered to be a violation of this program and/or an act of insubordination, with attendant disciplinary and employment consequences, up to and including discharge. An adulterated specimen will be viewed as a positive result, and will be treated as such.

Prior to assuming any job, during the initial 90 day probationary new hire period, and/or as requested in accordance with this program, applicants and employees will be asked complete a consent and release form authorizing the laboratory to perform the substance test(s) and release the results. Refusal to submit to such consent and testing will result in termination of employment and/or hiring. All employees will be tested either through pre-employment or new hire testing within the first 90 days of employment.

Employees whose job responsibilities require them to participate in medical monitoring programs in accordance with OSHA, state, local, contractual or other requirements will be required to participate in routine substance testing on a minimum annual basis, or as otherwise specified by regulation or contract. Refusal to submit to such testing will be considered a violation of this program and/or an act of insubordination, with attendant disciplinary and employment consequences.

When there is reasonable suspicion and/or evidence to suspect any employee has reported to work or is working impaired, he/she may be subject to substance testing. Refusal to submit to such testing will be considered a violation of this program and/or an act of insubordination, with attendant disciplinary and employment consequences. Employees required to submit to reasonable suspicion testing will have transportation to the collection facility provided by KEMRON.

Any employee involved in either a job-related accident or job-related incident involving the apparent violation of any safety rule or standard or which results in death, serious injury requiring off-site medical treatment, or vehicular or property damage in excess of $250.00, will be subject to substance testing. Refusal to submit to such testing will be considered a violation of this program and/or an act of insubordination, with attendant disciplinary and employment consequences. Employees required to submit to post accident testing will have transportation to the collection facility provided by KEMRON.

Employees holding safety critical or environmentally sensitive jobs, or where otherwise required by contract, may be subject to substance testing at any time on a random or other non-discriminatory basis, as a term and condition of holding such jobs. Incumbents of such jobs will be so notified.

Upon request, such employees will be considered for reassignment to a non-safety critical job that may be available, providing they are qualified and such reassignment is consistent with applicable personnel policies and/or contractual requirements. Any refusal by an incumbent of a safety critical job to submit to substance testing will be considered a violation of this program and/or an act of insubordination, with attendant disciplinary and employment consequences.

Upon reasonable evidence to suspect a violation of the prohibition on possession, an employee's wallet, purse, outer clothing; and the areas and containers above listed are subject to inspection for purposes of the program when brought onto the work site. The results of any

program testing will be considered a medical record, disseminated only in strict compliance with the KEMRON medical records procedures, to insure employee confidentiality.

The program will be administered so as not to interfere with the rights of handicapped applicants and employees, except to the extent any substance-related handicap would directly interfere with job performance.

Minimum substance testing requirements are summarized in the following table.

Table 10-2 Drug and Alcohol Testing Requirements

Type of Testing Required	Categories to be Tested	Explanation
Pre-employment*	Drug test only	Conditional to hire or before beginning work activity.
New hire evaluation*	Drug test only	Unannounced within the probationary 90 day new hire period.
Routine	Drug test only	Scheduled on a routine or recurring basis in accordance with regulatory or contractual requirements.
Reasonable suspicion	Drug and/or alcohol (Drug <32 hours; alcohol<8 hours following documentation of reasonable suspicion)	Required when there is evidence that employee is using drugs or alcohol in violation of KEMRON's policy. Based upon observation and documentation.
Post-accident	Drug and alcohol (Drug <32 hours; alcohol<8 hours following accident)	Required immediately following an accident/incident involving fatality, injury requiring off-site medical treatment, vehicular or property damage in excess of $250.00.
Random	Drug test only	Unannounced testing for those in safety sensitive positions or where required by contract.
Follow up to treatment or assessment **	Drug and/or alcohol	Unannounced testing during treatment and following treatment for a designated period of time.

** 100% of all employees will be tested either through pre-employment or new hire testing within the first 90 days of employment.** Treatment and return to duty will be evaluated and determined on a case-by-case basis by KEMRON management.*

Regulated Drug Categories to be Tested For

The minimum forms of substance testing to be conducted will be urinalysis (enzyme multiplied immunoassay technique screen, plus a Gas Chromatography/Mass Spectrometry confirmatory test) for a panel of 5 drugs, and/or a breath or saliva test with a confirmatory Evidentiary Breath Test. Should client or contractual requirements specify, additional substances may be included in the testing (such as 9 panel, or other as specified). To ensure integrity of testing and for protection of employee confidentiality, procedures and chain-of-custody guidelines

recommended by the US Department of Health and Human Services (DHHS) and required by United States Department of Transportation Federal Motor Carrier Safety Administration will be followed. All substance testing will be conducted by a laboratory certified by DHHS.

The following table lists the minimum drug categories to be tested and the cutoffs.

Table 10-3 Drug Screening Cutoffs

Drug Name	Screening Cutoff	Confirmation Cutoff
Cannaboids	50 nomogram/milliliter (NG/ML)	15 NG/ML
Cocaine Metabolites as Benzoylecgonine	300 NG/ML	150 NG/ML
Phencyclidine	25 NG/ML	25 NG/ML
Opiates (codeine, morphine)	2000 NG/ML	2000 NG/ML
Amphetamines	1000 NG/ML	500 NG/ML
Methamphetamines*	1000 NG/ML	500 NG/ML
Alcohol	0.02 grams of alcohol per 210 liters of breath	0.02 grams of alcohol per 210 liters of breath

**Specimen must also contain amphetamine at a concentration greater than or equal to 200 NG/ML.*

Pre-employment and New Hire Substance Testing

Potential employees or contingent new hires who fail to pass substance testing during pre-employment physicals or during the new hire 90 day probationary period will be ineligible for employment.

Routine and Random Substance Testing

If an employee's routine or random substance test is confirmed to be positive (in excess of levels listed in the above table), the testing laboratory will notify the KEMRON Human Resources (HR) Manager. The KEMRON HR Manager, and/or other company designated representative or Medical Review Officer will contact the employee to determine if there is a legitimate explanation for the confirmed positive result. Current employees who fail to pass substance testing during one routine physical or one random testing event will be immediately placed on administrative leave with pay during this initial review period.

An employee may be suspended with pay until a full evaluation has taken place and an appropriate course of action is determined. An employee who tests positive and is determined to be in violation of this program will be subject to disciplinary action, up to and including termination of employment.

Post-Accident and Reasonable Suspicion Testing

Employees involved in accidents/incidents on the job which result in fatality, bodily injury requiring off-site medical treatment, or vehicular or property damage exceeding $250 will be subject to immediate (within 24 hours) confirmatory drug and alcohol testing. If an employee's test is confirmed to be positive (in excess of levels listed in the above table), the testing laboratory will notify the KEMRON HR Manager. The KEMRON HR Manager, and/or other company designated representative or Medical Review Officer will contact the employee to determine if there is a legitimate explanation for the confirmed positive result. An employee may be suspended with pay until a full evaluation has taken place and an appropriate course of action is determined. An employee involved in an accident, incident, or injury on the job that tests positive and is determined to be in violation of this program will be subject to disciplinary action, up to and including termination of employment.

Reasonable suspicion testing will occur when: KEMRON observes behavior or performance problems which could adversely affect an individual's personal safety, or the safety of others; has reason to believe that an employee is under the influence; if the employee's supervisor has reasonable cause to suspect that the employee is in violation of this DFWP program and policy; or if the employee's job performance is deficient in a manner which suggests a possible violation of this DFWP program or policy. Where reasonable suspicion testing is necessary, the employee will be suspended with pay until a full evaluation has taken place and an appropriate course of action is determined. If an employee's reasonable suspicion test is confirmed positive, the testing laboratory will notify the KEMRON HR Manager. The KEMRON HR Manager, and/or other company designated representative or Medical Review Officer, will contact the employee to determine if there is a legitimate explanation for the confirmed positive result. If an employee tests positive and is determined to be in violation of this program, the employee will be subject to disciplinary action, up to and including termination of employment.

An employee discharged for positive results on routine, random, reasonable suspicion or post-accident drug or alcohol test will not be eligible for rehire. Only those persons with a "need-to-know" will be provided information regarding a drug or alcohol test and/or its results, consequences and status.

10.27 Excavation and Trenching

Excavation and/or trenching activities will be conducted in accordance with the applicable former Fort Ord site specific work plan. All excavation locations will be evaluated for underground utilities. The Regional Utility Notification Center (811 or 800-227-2700 USA North) will be notified at least two days prior to the start of excavation, as appropriate. All locations will be evaluated for aboveground and overhead utilities. Hand excavation must precede equipment use within 2 ft. of all marked utilities.

General Trenching and Excavation Plan

The trenching and excavation plan provides employees on KEMRON premises with procedures for trenching and excavation processes. Employees and contractors performing trenching/excavation do so in accordance with the following requirements. Trenching and excavation activities must be documented using the attached Trenching and Excavation Checklist in Appendix F.

For all future project tasks which include trenching and excavation, details will be submitted within the site specific work plans. The approved work plans will be submitted to the appropriate government authorities and will include the following:

- Names and qualification of competent person(s)
- Figures illustrating the aerial and cross section of excavation areas.
- Estimated dimensions of the trench or excavation
- Soil type within the excavation area, and method for determination (described in Sloping section).
- The location of underground and overhead utilities
- Associated digging permits
- Certified UXO clearance and/or UXO safety plan
- Waste Management Plan
- Erosion and Sedimentation Control Plan

Preparation

The following understandings apply prior to initiating any trenching or excavation activity:

- Employees and contractors will not initiate excavations without an approval of the Project Manager.
- Underground lines, equipment and electrical cables will be identified and located prior to beginning work.
- While any excavations are open, underground installations will be protected, supported or removed as necessary to safeguard employees.

Personnel

A competent person on site will perform the soil characterization and inspect the sloping, shoring, and/ or other appropriate safeguards. KEMRON Excavation, Trenching, and Shoring procedures will be used if required.

Access and Egress

- Structural ramps that are used solely by employees as a means of access or egress from excavations will be designed by an engineer or competent person. Structural ramps used for access or egress of equipment will be designed by a competent person qualified in structural design, and will be constructed in accordance with the design.
- Structural members will be connected together to prevent displacement.
- Structural members will be of uniform thickness.
- Cleats or other appropriate means used to connect runway structural members will be attached to the bottom of the runway or will be attached in a manner to prevent tripping.
- Structural ramps used in lieu of steps will be provided with cleats or other surface treatments on the top surface to prevent slipping.
- Means of egress from trench excavations such as a stairway, ladder, ramp or other safe means will be located in trench excavations that are 4 ft. 1.22 meter (m) or more in depth so as to require no more than 25 ft. (7.62 m) of lateral travel for employees.

Protection From Hazards Associated With Water Accumulation

- Employees will not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.

Emergency Rescue Equipment

- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, will be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment will be attended when in use.
- Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, will wear a harness with a life-line securely attached to it. The lifeline will be separate from any line used to handle materials, and will be individually attended at all times while the employee wearing the lifeline is in the excavation.

Testing and Controls

To prevent exposure to harmful levels of atmospheric contaminant and to assure acceptable atmospheric conditions the following requirements apply:

- Where oxygen deficiency (atmospheres containing less than 19.5% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in areas where hazardous substances may be present, the atmospheres in the excavation will be tested before employees enter excavations greater than 4 ft. (ft.) (1.22 m) in depth.
- Adequate precautions will be taken to prevent employee exposure to atmospheres containing less than 19.5% oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation.
- Adequate precautions will be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20% of the lower flammable limit of the gas.
- When controls are used to reduce the level of atmospheric contaminants to acceptable levels, testing will be conducted as often as necessary to ensure that the atmosphere remains safe.

Exposure to Vehicular Traffic

- Employees exposed to public vehicular traffic will be provided with and wear warning vests or other suitable garments marked with or made of reflectorized or high-visibility material which conforms to DOT Class II requirements.
- Active traffic will be diverted away from the excavation area.
- If it is necessary to cross an open trench then a plate or ramp will be utilized.

Utilities

- Investigation of a work area must be conducted before any work is to begin. Proper clearances must be maintained at all times. Equipment shall not deviate from established travel ways or work areas where clearances are unknown/ insufficient.
- All buried utilities shall be identified before any intrusive work in the work area. At no time shall a buried utility be attempted to be located by mechanically powered excavating equipment. Buried utilities shall be located by hand excavation.

Excavation Near Existing Features

Investigation of a work area must be conducted before any work is to begin. To prevent damage to existing features, including structures and utilities, hand digging will be performed within two ft. of existing features.

Exposure to Falling Loads

- No employee is permitted underneath loads handled by lifting or digging equipment. Employees will be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped to provide adequate protection for the operator during loading and unloading operations.

Warning Systems for Mobile Equipment

- When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system will be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

Protection of Employees from Loose Rock or Soil

- Adequate protection will be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection will consist of scaling to remove loose material; installation or protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.
- Employees will be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection will be provided by placing and keeping such materials or equipment at least 2 ft. (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Confined Spaces

Employees and contractors will not enter trenches and excavations deeper than 4 ft. without specific approval from location management.

Backfilling

Backfilling and removal of support systems may only be performed after employees have cleared the area.

Inspections

- Daily inspections of excavations, the adjacent areas, and protective systems will be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection will be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections will also be made after every rainstorm or other hazard increasing occurrence.
- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- The competent person will ensure that any crossings or walkways will be designed to protect against falls.
- Competent person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Requirements for Protective Systems; Sloping and Shoring

Sloping

For the any excavation and trenching activities at the former Fort Ord project sites, soils will be considered Type C unless existing conditions demonstrate greater competency in soil.

In addition: It is not anticipated that any excavation will exceed 4 ft. in depth at any former Fort Ord project site.

Excavations will be sloped at an angle not steeper than one and one-half horizontal to one vertical (1 1/2 H:1V) (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

- Maximum allowable slopes, and allowable configurations for sloping and benching systems
- Sloping and benching system is designed by a registered professional engineer.

Allowable configurations for sloping and benching systems:

- Excavations made in Type A soil.

- Definition: Type A Soil

Type A means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) or greater.

Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and in some cases silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

a. The soil is fissured; or

b. The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or

c. The soil has been previously disturbed; or

d. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or

e. The material is subject to other factors that would require it to be classified as a less stable material.

Requirements:

All simple slope excavations 20 ft. or less in depth will have a maximum allowable slope of 3/4 H:1V. However, it is not anticipated that any excavation will exceed 20 ft. in depth at any former Fort Ord project site.

Simple Slope - General

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 ft. or less in depth will have a maximum allowable slope of 1/2H:1V.

Simple Slope - Short Term

All benched excavations 20 ft. or less in depth will have a maximum allowable slope of 3/4H:1V and maximum bench dimensions as follows:

Multiple Bench

All excavations 8 ft. or less in depth which have unsupported vertically sided lower portions will have a maximum vertical side of 3 ½ ft.

Unsupported Vertically Sided Lower Portion - Maximum 8 Ft. In Depth

All excavations more than 8 ft. but not more than 12 ft. in depth which have unsupported vertically sided lower portions will have a maximum allowable slope of 1H:1V and a maximum vertical side of 3 ½ ft.

Unsupported Vertically Sided Lower Portion - Maximum 12 Ft. In Depth

All excavations 20 ft. or less 10in depth which have vertically sided lower portions that are supported or shielded will have a maximum allowable slope of 3/4H:1V. The support or shield system must extend at least 18 inches above the top of the vertical side.

Supported or Shielded Vertically Sided Lower Portion

All other simple slope, compound slope, and vertically sided lower portion excavations will be in accordance with the other options permitted under Section 1926.652(b).

The KEMRON Excavation and Trenching Standard Operating Procedure (SOP) should be referenced in the event that Type B or Type C soils are encountered. This SOP is included in Appendix H.

Shoring

It is not anticipated that any excavations at any former Fort Ord project site will require shoring. The KEMRON Excavation and Trenching SOP should be referenced in the event that Shoring is required. This SOP is included in Appendix F.

10.28 Site Specific Fall Protection and Prevention Plan

The following fall protection and prevention plan is provided to address common fall protection for building and grounds maintenance situations which may arise at the project site.

The fall protection plan, including elevated work and ladder safety, is designed to protect employees performing elevated work from falls and injuries. Fall protection is required for construction or demolition related work performed at an elevation of 6 ft. or more above a lower level. Work on flat roofs and other flat fixed surfaces is not considered elevated work unless employees are: Within 15 ft. or less of a roof edge which is greater than 6 ft. in height; if employees can fall more than 6 ft. to a lower level through a hole or opening which is greater than 6 ft. in height, and protection must be provided to prevent employees from tripping or stepping into holes as long as they are at least 2 inches or more in size in their smallest dimension.

All operations where there are potential fall hazards will be conducted under the supervision of a trained competent person. The KEMRON Fall Protection SOP is included as Appendix G, and shall be referenced in the event that elevated work is required. KEMRON employees and contractors performing work on KEMRON job sites will adhere to the work practices outlined in the KEMRON Fall Protection SOP regarding the safe work practices.

Responsibilities

SSHO/UXOSO and/or TM Responsibilities

The SSHO/UXOSO and/or TM will ensure that elevated work hazards are properly identified in the project specific health and safety plan, and employees involved in performing elevated work have been properly trained in accordance with this section.

The SSHO/UXOSO and/or TM will ensure that a competent person is assigned to conduct the following activities as a monitor:

- Recognize fall hazards
- Warn employees if they are unaware of a fall hazard or are acting in an unsafe manner
- Be on the same working surface and in visual sight of employees performing elevated work
- Stay close enough for verbal communication

  Have no other assignments that would take the monitor's attention from his/her monitoring function.

Employee Responsibilities

Each employee is responsible for following the project specific health and safety plan, implementing this elevated work procedure, and following verbal and written direction of the SSHO/UXOSO and PM regarding safe work practices.

Procedures

A Fall Protection Checklist located in Appendix G, will be completed for each elevated work activity. Employees performing elevated work must be protected from falls with one or more of the following types of protection:

- Fixed work platforms with approved guardrail systems
- Safety net systems, or
- Personal fall arrest systems
- Safety belts or harnesses.

All equipment and raw materials for use in fall protection systems will conform to applicable American National Standards Institute and American Standard Test Method standards.

Scaffolds

It is not anticipated that scaffolding will be utilized at any of the former Fort Ord project site.

Vehicle mounted elevating and/or rotating work platforms.

It is not anticipated that vehicle mounted platforms will be utilized at any of the former Fort Ord project site.

Training

Employees must be trained in elevated work practices and related equipment. Training will be provided by Marilyn Zumbro, KEMRON's CSHM, or a qualified person designated by the CSHM. Training requirements identified in 29 CFR 1926.503 are as follows:

Training Program

a. The employer will provide a training program for each employee who might be exposed to fall hazards. The program will enable each employee to recognize the hazards of falling and will train each employee in the procedures to be followed in order to minimize these hazards.

b. The employer will assure that each employee has been trained as necessary, by a competent person qualified in the following areas:

c. The nature of fall hazards in the work area;

d. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;

e. The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;

f. The role of each employee in the safety monitoring system when this system is used in lieu of other alternate methods;

g. The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;

h. The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection; and

i. The role of employees in fall protection plans;

j. The standards contained in this subpart.

Certification of training.

a. The employer will verify compliance with paragraph (a) of this section by preparing a written certification record. The written certification record will contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer.

b. If the employer relies on training conducted by another employer or completed prior to the effective date of his section, the certification record will indicate the date the employer determined the prior training was adequate rather than the date of actual training.

c. The latest training certification will be maintained.

Retraining.

a. When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (a) of this section, the employer will retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

b. Changes in the workplace render previous training obsolete; or

c. Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or

d. Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

Ladders

Ladder will likely be used during project activities at the former Fort Ord project site. All operations where there is potential for ladder use will be conducted under the supervision of the SSHO/UXOSO. An activity hazard analysis will be completed by a trained competent person prior to any activity involving ladders. The KEMRON Ladder Safety SOP protocol is included as Appendix G, and shall be referenced in the event that elevated work is required. KEMRON employees and contractors performing work on KEMRON job sites will adhere to the work practices outlined in the KEMRON Ladder Safety SOP regarding the safe use of ladders.

10.29 Steel Erection Plan

Steel erection activities are not associated with the tasks to be performed under this contract.

10.30 Night Operations Lighting Plan

Night operation activities are not associated with the tasks to be performed under this contract. In the event that night operations will be performed, then a qualified person will prepare a lighting plan. The plan will be provided to appropriate representatives for review and night work will not proceed until plan approval.

10.31 Site Sanitation Plan

A portable toilet and washroom facilities will be available for the project. Sanitary facilities, permanent or temporary will be provided at the former Fort Ord project site. The placement of sanitary facilities will be approved by KEMRON representatives, prior to delivery onsite. The requirements for sanitary facilities on site will meet all applicable standards found in CFR 29 1910.120 (n)(3) and the KEMRON operating procedure.

TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One
More than 20, fewer than 200 employees	One toilet seat and one urinal per 40
More than 200 employees	One toilet seat and one urinal per 50

For this project, one sanitary facility shall be provided for every 20 employees.

Adequate lavatory facilities will be provided for employees to wash their hands at each break, before eating, drinking or smoking, and at the end of the work day. For the former Fort Ord project site a lavatory facility will include tepid running water, soap and disposable hand drying towels. The work site will be equipped with water, soap and towels for hand washing. Safe drinking water shall be provided to all KEMRON employees, subcontractors, and site visitors during active projects.

10.32 Fire Prevention and Protection Plan

KEMRON maintains superior standards of fire protection to safeguard against damage to property and to prevent interruption of operations that may result from fires.

SSHO/UXOSO Responsibilities

The SSHO/UXOSO responsibilities with regard to fire prevention and control are summarized in these three general points:

1. Maintain an awareness of fire hazards and assure the installation of positive safeguards
2. Conduct regular, periodic inspections of work areas to assure that they remain in a fire-safe condition
3. Indoctrinate each employee to develop a fire-conscious attitude for elimination of hazards and observance of safe practices and check their subsequent performance

Fire Prevention Plan

Good housekeeping is a principle factor in preventing fires. The supervisor can exercise direct control by:

- Eliminating accumulations of rubbish and unnecessary combustible materials
- Keeping doors, exits and aisles clear
- Storing flammable liquids in safety cans
- Preventing leaks and spills of flammables
- Neatly piling stock and other materials

Flammable and Combustible Materials

KEMRON employees will be provided with a list which identifies and combustible materials on site. The list will also include the quantities, locations and storage methods, for the listed material.

Electrical Equipment

Approved electrical equipment will be utilized in all areas of the facility. Electrical circuits will utilize circuit breakers as a means of preventing overload. All electrical circuit breaker boxes will be Underwriters Laboratories listed and the wiring will meet the requirements of the National Electric Code.

Smoking Regulations

Supervisors are responsible for rigidly enforcing NO SMOKING regulations among their own employees and others who enter their area of responsibility. Signs must be posted and smoking prohibited near flammable liquids and gases, and in areas where combustibles are stored or used. Appropriate receptacles must be provided and used where smoking is permitted.

Fire Protection Equipment

The use of fire protection equipment for other than fire emergencies is prohibited.

Fire Hose and Fixed Fire Equipment

- Fire hose and fixed firefighting equipment used on KEMRON sites must meet applicable governmental and NFPA standards and be approved by location management
- No part of a fire protection system will be closed nor operated without prior notice and approval of the SSHO/UXOSO. This includes fire sprinkler control valves,

sectional control valves, hydrants, hose standpipes, fixed extinguisher systems or any other type fire protection system. Special tags will be issued by the SSHO/UXOSO for fire protection equipment when it must be closed, tested, or temporarily altered in any way

Fire Extinguishers

Site fire extinguisher protection shall be provided as follows:

- A fire extinguisher rated not less than 2A is provided for every 3000 square ft. of building area. Travel distance to the nearest extinguisher must be 75 ft. or less.
- Fire extinguishers are located on each floor and adjacent to stairwells on multistory buildings.
- Fire extinguisher users are identified and trained in accordance with applicable governmental requirements.
- A fire extinguisher rated not less than 10B shall be provided within 50 ft. of flammable or combustible liquids or flammable gases in quantities of more than 5 gallons or 5 pounds.
- Fire extinguishers are listed by a nationally recognized testing laboratory.
- Fire extinguishers are inspected monthly in accordance with NFPA No. 10, "Portable Fire Extinguishers".
- Fire extinguishers receive an annual maintenance check in accordance with 29 CFR 1910.157(e)(3).
- Fire extinguishers receive a hydrostatic test in accordance with 29 CFR 1910.157(f), "Hydrostatic Testing".
- Fire extinguishers are selected in accordance with 29 CFR 1926.150, Table F-1, "Fire Extinguisher Data".

Four classes of fires:

- **Class A** - involving paper, wood, cloth and similar combustibles. Extinguishment is usually by cooling; generally with water
- **Class B** - involving flammable liquids and similar materials where exclusion of air is most effective for extinguishment
- **Class C** - electrical fire where cooling and/or exclusion of air is effective. However, non-conductive extinguishing agents must be used to avoid electric shock
- **Class D** - metal fires

Types of Extinguishers

1. Pressurized Water - This type of extinguisher is for use only on Class A fires.
2. Dry Chemical - This type of extinguisher is the most effective on Class B and Class C fires.
3. CO_2 - This type of extinguisher will handle Class B and Class C fires but is less effective than the dry chemical. However, it leaves no residue to clean up or contaminated equipment and is therefore desirable for use on small electrical fires.
4. Special extinguishing agents - In certain cases, an unusual fire hazard will be present, e.g., magnesium machining. When such situations arise, special fire extinguishing agents will be provided.

Flammable Liquids and Gases:

Indoor storage of flammable and combustible liquids

Requirements for indoor storage of flammable and combustible liquids:

- Not more than 25 gallons stored outside approved cabinets.
- Quantities of 25 gallons or more are stored in approved cabinet.
- Cabinets are labeled "Flammables - Keep Fire Away".
- Not more than 60 gallons of flammable or 120 gallons of combustible liquids are stored in any one cabinet and not more than 3 cabinets in a single storage area.

Outside storage areas

Outside storage areas must meet the requirements of 29 CFR 1926.152 (c), "Storage Outside Buildings".

- Flammable and combustible liquids are dispensed in accordance with 29 CFR 1926.152 (e), "Dispensing Liquids".
- Areas in which flammable or combustible liquids are transferred in quantities greater than 5 gallons from one tank or container to another tank or container, shall be separated from other operations by 25 ft. distance of by construction having a fire resistance of at least 1 hour. Drainage, ventilation or other means shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.
- Transfer of flammable liquids from one container to another shall be done only when the containers are electrically interconnected (bonded).

- Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or tanks within a building or outside only through a closed piping system or from safety cans. Flammable liquids shall be transferred by means of an approved device drawing through the top of a container, or from portable tanks, by gravity or pump, through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks is prohibited.
- The dispensing units shall be protected against collision damage.
- Dispensing devices and nozzles for flammable liquids shall be of an approved type.
- There shall be no smoking or open flames in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing of flammable or combustible liquids.
- Flammable liquids must be kept in closed containers when not in use and are not allowed, under any circumstances, within 50 ft. of an open flame or ignition source.
- Tank trucks for refueling meet the requirements of the standard for tank vehicles for flammable and combustible liquids, NFPA No. 385, "Flammable and Combustible Liquid Tank Vehicles".
- Service and refueling areas must meet the requirements of 29 CFR 1926.152 (g), "Service and Refueling Areas".
- Temporary heating devices must be used in accordance with 29 CFR 1926.154, "Temporary Heating Devices".

Hot Work Procedures

Hot work is any operation that involves flame or spark-producing operations. A hot work permit is defined as the employer's written authorization to perform operations which could create a source of ignition, including:

- Riveting
- Welding
- Torch Cutting
- Grinding
- Brazing
- Burning
- Heating
- Use of any open flame
- Use of spark producing tools

Where possible, hot work should not be conducted in the presence of flammable gases, vapors, liquids, or dusts (where an ignitable or explosive concentration can develop). Atmospheric testing prior to work commencement, and periodically thereafter, will be conducted if the atmosphere in the work area has the potential to become hazardous.

Atmospheric testing will include percent by volume of the lower exposure limit (%LEL), percent by volume of oxygen (%$O_{2)}$, and toxicity (organic vapors using a Photoionization Detector). Any employee responsible for conducting atmospheric testing will be appropriately trained in the use of the equipment prior to initiation of Hot Work. All equipment used for atmospheric testing will be calibrated following manufacturer's instructions prior to use and the results of such calibration noted in the instrument(s) log book, and appropriately noted on the Hot Work Permit.

Fire hazards must be removed from the area of the hot work whenever feasible. If the object requiring the hot work cannot be moved and all fire hazards cannot be removed, guards will be used to confine the heat, sparks and slag, and to protect the immovable fire hazards.

If Hot Work must be performed, the following permit procedures must be observed. Hot Work performed in a confined space is subject to the additional requirements of KEMRON's Permit Required Confined Space program.

Permit Writer

The permit writer is responsible for:

Inspecting the work area for a distance of at least 35' around the hot work area site, specifically locating and addressing flammables/combustibles in the work area

- Documenting survey results and fire prevention/site preparation activities on the permit form
- Ensuring equipment and area are properly prepared and are safe for the performance of the work
- Ensuring that air monitoring has been completed
- Checking for proper placement and availability of fire extinguishers and other safety equipment
- Reviewing emergency procedures with persons conducting the hot work
- Informing fire watch of fire hazards
- Signing the hot work permit after permit conditions are met
- Monitoring work progress
- Stopping work if an unsafe condition occurs

- Immediately upon completion of work, inspecting work area(s) to determine they are safe for use by others.

Fire Watch

The fire watch responsibilities are:

- Observing an area of at least 35' around and above the hot work area and maintaining the area free of combustibles and tripping hazards
- Performing no other duties while assigned on watch
- Understanding and following the conditions listed on the Hot Work Permit
- Must be trained in the use of fire extinguishing equipment provided
- Understanding the alarms and where/how to activate them
- Notifying the person doing the work if any sparks are not contained in the work area
- Sounding the alarm for assistance and extinguish any small fires started by sparks
- Remaining on the scene from the start of work until 60 minutes after completion of all hot work

Persons Doing the Work

Persons doing the work must:

- Read, understand and follow all conditions listed on the Hot Work Permit
- Advise other workers of any special conditions or precautions
- Survey the work area to confirm safe working conditions. Know the location of the nearest telephone, fire alarm, emergency communication device, fire extinguisher, safety shower, first aid kit, etc., before starting work, and know how to use all such safety devices
- Confine all sparks as close to the work area as possible
- Be aware of conditions in the work area and stop work if conditions change. Work will not resume until approved by the Permit Writer
- Clean up and secure work area upon completion of job.

Procedure

- The Permit Writer will obtain a hot work permit by advising the SSHO/UXOSO in advance of expected hot work operations. Hot Work Permits are valid only for one work shift and for only those persons who are assigned and listed on the permit to perform the work.

- The Permit Writer will complete the information on the Hot Work Permit as accurately as possible. Include the date work is to be performed, a description of the work to be performed, name of persons performing the work, location where the work will be performed and the time work will be performed. Complete the checklist on the Hot Work Permit (Appendix H).
- Complete and record results of initial air monitoring per the permit form. Initial monitoring will include %LEL, Toxicity and %O2.
- If %LEL readings exceed 10%, or other unsafe atmospheric conditions are identified, hot work may not be performed until explosive/dangerous conditions are mitigated.
- The completed Hot Work Permit will be returned to the SSHO/UXOSO for review prior to commencement of the hot work.
- Post the permit in a conspicuous place while the work is in progress.
- Periodic air monitoring must be performed and results recorded on the permit form.
- Return the permit to the SSHO/UXOSO when work is completed. Permits will be valid for one shift only.
- When any alarm sounds, stop all work, disconnect all electrical equipment, and secure all gas cylinders. Work will not resume until notification from the Permit Writer.

Fire Watch

In addition to the above requirements, a fire watch shall be present when any hot work is performed, as required.

- Fire watchers shall be required whenever hot work is performed in locations where other than a minor fire might develop.
- Fire watchers shall be required when appreciable flammable or combustible material is closer than 35 ft. (10.7 m) to the point of operation.
- Fire watchers shall be required when appreciable combustibles are more than 35 ft. (10.7 m) away but are easily ignited by sparks.
- Fire watchers shall be required when wall or floor openings within a 35 ft. (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.
- Fire watchers shall be required when combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

- Fire watchers shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least one hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

Training and Record keeping

Affected personnel will be trained in fire-suppression techniques upon initial assignment and at least annually thereafter. They shall be instructed in:

- Locations and proper use of the fire extinguishers supplied on site.
- Emergency notifications procedures.
- Respiratory protective equipment that is required in the near vicinity of a fire.
- Techniques for smothering fires using available noncombustible materials.
- Emergency evacuation procedures in the event fires reach an out-of-control condition.

All personnel will be instructed in the Site Safety and Health Plan emergency notification procedures.

Any employee responsible for conducting atmospheric testing will be appropriately trained in the use and proper calibration of the equipment prior to initiation of work conducted under the Hot Work Permit.

Records will be maintained by the company whose employees have been trained for at least three years or until facility closure for current employees. Records for former employees will be retained for at least three years in appropriate personnel files at KEMRON offices.

Records of annual fire extinguisher maintenance will be retained for one year after the last entry or life of the shell.

10.33 Wild Land Fire Management Plan

Prescribed burn plans will be required for the controlled burns that will be conducted based on the SOW. These plans will be developed by POM Fire Department in conjunction with the former Fort Ord BRAC Office, USACE and additional stakeholders and will be submitted as prescribed burn plans for applicable areas.

10.34 Pre-Cast Concrete Plan

Pre-cast concrete activities are not associated with the tasks to be performed under this contract.

10.35 Heat/Cold Stress Monitoring Plan

The heat and cold stress plan is designed to protect employees from the effects of heat and cold stress by supplying information and training on recognition, symptoms, and control of heat and cold stress.

SSHO/UXOSO Responsibilities (Heat Stress)

Each SSHO/UXOSO is responsible for:

- Being aware of work areas which could be a potential source of heat stress to workers.
- Requesting or taking temperature readings.
- Determining stay times as necessary for work in hot environments.
- Using these stay times as guidelines for the length of time workers may work in hot environments.
- Ensuring the appropriate engineering controls are used to reduce the heat load.
- Encouraging workers who are beginning work in hot environments to acclimatize themselves to the heat. Twenty percent more work each day in a hot environment is recommended to properly acclimatize.
- Encouraging workers to self-pace in hot environments.
- Ensuring personnel working in hot environments have been trained as required by this procedure.
- Providing cool rest areas and sufficient break times.
- Ensuring cool drinking water or electrolyte replacement is provided.
- Closely monitoring employees working in hot environments for signs and symptoms of heat stress.
- Monitoring progress and status of workers in hot environments and limiting their stay times based upon worker response, physical status, and activity level.
- Using the checklist (Appendix I) when the WBGT index exceeds 110 degrees Fahrenheit.
- Rescheduling work in hot environments to cooler times of the day if feasible and practical.

Employees Responsibilities

Employees who must work in hot environments are responsible for practicing common sense preventive measures to further reduce the chance of developing heat related disorders. These measures include the following:

- Being aware of the symptoms of heat stress and the condition of those workers around them when working in a high temperature area.
- Drinking water or other approved fluids frequently (every 20 minutes).
- Keeping themselves in good physical condition and informing the SSHO/UXOSO if their physical condition changes with regards to susceptibility to heat stress (for example, heart condition or taking prescribed medications).
- Wearing appropriate clothing.
- Working at a pace consistent with the work environment.
- Using the stay times determined by the SSHO/UXOSO as guidelines for determining the length of time able to work in a hot environment and taking breaks in accordance with these times.
- Leaving the hot work environment if any symptoms of heat stress develop and immediately notifying their SSHO/UXOSO.

General Requirements for Working in Hot Environments

Work Area Evaluation

To effectively control heat stress, the work place environment must be monitored for temperature, humidity, airflow, radiant heat sources, the type of work to be performed and the radiological and non-radiological clothing requirements. The proper evaluation of these parameters and conditions forms the basis for determining stay times and the proper work/rest schedules.

Wet Bulb Globe Temperatures (WBGT)

Proper determination of WBGT will provide an estimate of body heat losses/gains through convection, radiation, and evaporation. The WBGT will be used to determine stay times and the WBGT values are calculated using one of the following equations (based on the work conditions):

With DIRECT exposure to sunlight:

$$WGBT_{out} = 0.7\ T_{nwb} + 0.2\ T_g + 0.1\ T_{db}$$

With OUT direct exposure to the sun

$$WGBT_{in} = 0.7\ T_{nwb} + 0.3\ T_g$$

Evaluation of Work Activity

Although work area temperature and humidity are important, the intensity of work is also important in determining stay times. For the purpose of heat stress, work can be divided into three types:

- **Light work** - Sitting or standing while monitoring a gauge, leisurely walking to take readings or inspections, sorting materials or calibrating instruments, desk work, operating powered equipment.
- **Moderate work** - Light or moderate arm work at a machine or bench, mopping and sweeping, welding, decontamination work, pump and valve rebuilding, most material handling and work not requiring continual motion, fast walking, light lifting.
- **Heavy work** - Demanding work as intermittent heaving lifting, pushing, pulling or climbing ladders or stairs, work requiring continual motion.

When considering what stay time is appropriate for various work types at the same location, the most demanding work type should be used when determining stay times. For example, a job requiring 40% of the time climbing and 60% welding, the stay time should be calculated using the heavy work of climbing as the basis for determining stay time. This determination should be tempered by supervisory judgment and not have an entire job classified as heavy work when less than 10% of the job involves heavy work. Additionally, the effort (walking or climbing) to reach the rest area should be considered in stay time, not rest time.

Evaluation of Clothing Requirements

Clothing that does not allow free air exchange severely limits the amount of cooling available from evaporation. Generally the thicker and more impermeable the clothing, the more it will interfere with the transfer of heat from the body. To compensate for the loss of an important source of body heat removal if workers are wearing impermeable clothing (welding leathers, paper suits, plastics, rubber lined clothing) or heavy cotton coveralls, then 7^{o}F must be added to the WBGT index. If double layers of breathable clothing are used, add 4^{o}F to the WBGT index.

Stay Times

The stay time is a guideline that provides an estimate of how long workers may be able to work in a hot environment. Since everyone reacts to heat differently, some employees may not be able to work the entire stay time and may need more frequent breaks. Other workers will be able to work in the hot environment for a longer period of time.

SSHO/UXOSOs shall use the stay time as an estimate of how long employees can work in a hot environment. They must check with their workers as the elapsed time approaches the stay time. This is especially important at higher WBGT temperatures or with acclimatized workers.

Workers must not be forced to work beyond or even up to the stay time if they feel they are not capable of continued safe work or if they begin to show any symptoms of heat stress. Employees may continue to work beyond the stay time if they feel comfort and show no symptoms of heat stress. Job Supervisors must ensure the workers maintain a constant watch on one another to make sure no one shows any symptoms of heat stress. Table 11.35-1 shall be used by the Job Supervisor to determine the recommended stay time. The stay time must take into account the WBGT, the type of work being performed and the clothing required.

The calculated stay time should be balanced by a recommended rest period of 1 hour or until the workers show no signs of heat stress in an environment with a temperature range of 73^{o}-76^{o}F.

Table 10-4 Work Rest Regimen - Action Limit (WBGT values in °C) 2010 ACGIH TLV

Work-Rest Regimen	Light	Moderate	Heavy	Very Heavy
Continuous Work 75 – 100%	28.0°C 82.4°F	25.0°C 77.0°F	--	--
50% Work- 50% Rest, each hour	29.5°C 85.1°F	27.0°C 80.6°F	25.5°C 77.9°F	24.5°C 76.1°F
25% Work- 75% Rest, each hour°	30.0°C 86.0°F	29.0°C 84.2°F	28.0°C 82.4°F	27.0°C 80.6°F

Table 10-5 Work Rest Regimen – Threshold Limit Value (WBGT values in °C) 2010 ACGIH TLV

Work-Rest Regimen	Light	Moderate	Heavy	Very Heavy
Continuous Work 75 – 100%	31.0°C 87.8°F	28.0°C 82.4°F	--	--
75% Work- 25% Rest, each hour	31.0°C 87.8°F	29.0°C 84.2°F	27.5°C 81.5°F	--
50% Work- 50% Rest, each hour	32.0°C 89.6°F	30.0°C 86.0°F	29.0°C 84.2°F	28.0°C 82.4°F
25% Work- 75% Rest, each hour°	32.5°C 90.5°F	31.5°C 88.7°F	30.5°C 86.9°F	30.0°C 86.0°F

Clothing-Adjustment Factors for some Clothing Ensembles*

Clothing Type	Addition to WBGT (°C)
Work Clothes (long sleeve shirt and pants)	0
Cloth (woven material) coveralls	0
Double-layer woven clothing	3
Spunbound Melt-Blown Synthetic polypropylene coveralls	0.5
Polyolefin coveralls	1
Limited-use vapor-barrier coveralls	11

** These values must not be used for fully encapsulated ("Level A") suits. Clothing Adjustment Factors cannot be added for multiple layers. The coveralls assume that only modesty clothing is worn underneath, not a second layer of clothing.*

Controlling Exposure to Heat

There are several ways to effectively reduce the risk of heat stress in hot environments, including work rescheduling, permitting workers to gradually acclimate to the heat, modifying clothing and equipment, or through the use of engineering controls.

Work Scheduling

The most effective way to reduce heat stress is to reschedule the job when heat loads are lower or to physically move the job to a cooler location.

- Hot work should be scheduled during the cooler hours of the morning or off shifts. Since the body burden from heat is cumulative, double shifts and overtime work should be discouraged in hot environments.
- Whenever possible, work should be rescheduled for a day when the ambient temperature is expected to be lower.
- If possible, work should be relocated away from operating equipment to a cooler area. If working outside, move the job to a shady spot.

Self-Pacing

When workers are properly trained to recognize the signs and symptoms of heat stress, they are in the best position to judge how long they can work in a hot environment. In self-pacing, workers are encouraged to exit the work area whenever they feel they are not capable of continued safe work or if they begin to show any symptoms of heat stress.

Preparing for the Heat Acclimatization

The process of becoming accustomed to work in a hot environment is called acclimatization, the adaptation of the body to tolerate heat. Acclimatization of workers is essential to preventing heat related illness. Job Supervisors should ensure that workers are adequately acclimatized to the heat, using the guidelines below:

- For workers entering a hot work environment for the first time, 7-10 days with gradual increasing duration of heat exposure is necessary to complete the acclimatization period.
- Every unacclimatized worker shall be permitted to determine their own working time. Daily exposure required to start the acclimatization process is at least 2 hours unless the WBGT is extremely high.
- Job Supervisors shall encourage workers to gradually increase their stay time and work load during acclimatization. Although many people think it is "tough or macho" to be able to work in the heat; this attitude should be discouraged.
- Workers who are absent from the hot work environment for a week or more (training, vacation, etc.) will notice a significant loss of their ability to tolerate heat. These workers may require a re-acclimatization period and Job Supervisors should remind workers of the necessary gradual introduction into the workforce. The acclimatization period for these workers upon return to work is usually 2-3 days.

Proper Clothing

Workers working in hot environments should wear loose fitting clothing. Clothes should preferably be made from natural fiber material such as cotton or light wool, if the work situation allows. These absorb sweat and dry more quickly allowing for better cooling.

Rest Areas and Breaks

Providing cool rest areas during breaks helps to reduce the heat stress from working in hot environments. Workers should be allowed to take breaks in cooler areas. Although there is no standard for how cool the rest area should be, approximately 73-76 ^{o}F should be the lower temperature range.

Break times provide a work-rest cycle and can be as long as one hour for high heat stress areas. The break time must be sufficient to allow the worker to cool down to near pre-exposure conditions.

Drinking Water/Fluids

In a heavy day's work, a worker can produce up to two gallons of sweat. Since heat-related illnesses are often the result of dehydration, it is essential that workers take in a sufficient amount of water. The thirst drive is not adequate to ensure enough water has been consumed. Ideally, a worker should drink approximately every 20 minutes.

- Job Supervisors shall ensure that cool drinking water is available to workers working in hot environments.
- Water is the best fluid to drink. However, some workers will drink more liquid if physiologic electrolyte replacement fluid (e.g., Gatorade) is available. This type of drink may be made available to workers to encourage them to consume a sufficient amount of fluids.

Administrative Control

The establishment of a work, rest regimen shall be done to protect workers exposed to extremes in temperatures. KEMRON has revised our corporate work/rest regimen. The new corporate policy is based on the current American Conference of Governmental Industrial Hygienists Permissible Heat Exposure Threshold Limit Values. This work/rest regimen table will be included with the APP and prior to any work conducted at the project sites where applicable.

Engineering Controls

Engineering controls are the most effective way to control heat exposure in that the heat source is removed or isolated from the work area. These controls may include:

- **Heat Shields and Insulation:** Reflective heat shielding can reduce the radiant heat load by as much as 80%. Proper insulation of steam lines and equipment can also reduce the radiant heat load.
- **Fans/Blowers:** These units can increase the air velocity over the workers and increase the evaporative heat loss in humid environments; however, fans are not always effective, especially in hot/dry environments. Fans should be provided to increase air movement whenever possible.
- **Portable Air Conditioning Units:** The benefits from these units are obvious. However, power and size constraints do limit their effectiveness.
- **Power Tools:** The use of power tools will lower workers metabolic energy expended and should be used whenever possible.
- **Personal Cooling Devices:** Cooling vests and air cooled suits reduce the overall worker heat load and should be used as necessary. Proper use of these garments is essential. Cool vests shall be donned as follows:
- Do not put the vest directly on your skin; wear a shirt.
- Don the garment with the ice packs on the outside.
- Make sure the vest is loaded and the ice packs are completely frozen.
- When you enter the hot environment, note the time of entry.
- While working in the hot environment, if body temperature increases, discomforts arise or complete melting of the ice packs occur, leave the area immediately.
- Once outside the hot environment, take time to readjust to the cooler temperature before removing the vest.
- Once the vest is removed, place it back in the freezer. If it was worn in a radiological area, have Radiation Safety frisk it first to ensure it is clean.

Special Considerations

There are many factors that affect worker's ability to tolerate heat. For example, workers who have had a previous heat related illness are more susceptible to the heat during subsequent exposures. Other factors include age, sex, physical condition, weight, use of prescription medications, alcohol consumption, medical conditions, and diet. Employees shall inform medical of any heart conditions breathing problems or other conditions which they believe may affect their ability to tolerate the heat.

Heat Stress Checklist

The Heat Stress Checklist, included as Appendix I, shall be completed for all work planned in areas with 110 degrees Fahrenheit. WBGT or greater. This form shall be completed by the SSHO/UXOSO or TM prior to the start of the job.

A copy of the completed checklist will be maintained by KEMRON for one year prior to discarding it.

Cold Stress

Workers should be protected from exposure to extreme cold temperatures so that the body temperature does not fall below 36 degrees Celsius (98.6 degrees Fahrenheit). Lower body temperature may result in reduced mental alertness, in irrational decision making or loss of consciousness.

When the air temperature is below 40 to 45 degrees Fahrenheit, workers shall have warm clothing, gloves and heavy socks, such as whole-body thermal underwear, wool socks, or insulated gloves and knit caps. If it is anticipated that the worker's clothing will become wet due to conditions on the job site, then outer impermeable layers will be worn. When the worker's underclothing becomes wet, the worker will change into dry clothing. The following provisions may also be made as necessary:

- Hot liquids shall be provided in the break area, but the intake of coffee shall be limited because of the diuretic and circulatory effects.
- Workers observed shivering shall leave the cold area immediately.
- Workers shall wear multiple layers of clothing with the thinner clothing next to the body and the heavier clothing on the outside.
- Overdressing that could lead to heat stress will be avoided.
- Work shall be arranged to avoid long periods of sitting still or standing.

Symptoms of cold stress may include shivering, numbness, low body temperature, drowsiness and weakness. Treatment for Cold Stress Include the Following:

- Move victim into warm room as soon as possible.
- Be alert for breathing difficulties.
- Remove wet or frozen clothing; immediately rewarm victim by wrapping in blankets.
- Give victim hot liquids to drink, only if conscious.
- Follow treatment for frostbite.
- Consult professional medical help, if required.

Treatment for Frostbite:

The treatment of frostbite will depend on the severity of skin damage. Hospitalization may be necessary in some severe cases. It's important to seek an evaluation by a medical professional as soon as possible. All types of frostbite require re-warming of the affected area, usually by gently warming the exposed skin in lukewarm water. If blisters occur, they should be left intact whenever possible. Elevating the affected part may be necessary if swelling occurs.

Training

An effective Heat/Cold Stress Program requires training and awareness on the part of the SSHO/UXOSO, Supervisors and workers. All workers who work in hot environments must receive annual training from the Safety Department or Industrial Hygienists in the prevention of heat stress, recognizing the signs and symptoms of heat stress, first aid treatment for heat related illnesses and use of cooling equipment.

SECTION 11 RISK MANAGEMENT PROCESSES

The KEMRON SSHPs include AHAs for individual project tasks and shall be considered equivalent to the AHAs. These activity hazard analyses identify the physical, chemical, and environmental hazards associated with each project task and provide the appropriate protective measures for the employees conducting the task the environment.

Activity hazard analyses have been prepared for all tasks for the projects and are included in the KEMRON SSHP, Appendix A of this APP. The activity hazard analyses will be modified by the SSHO/UXOSO and TM based on observed field conditions and when safety requirements change. The modified activity hazard analyses will be reviewed with all KEMRON employees, subcontractors, and site visitors.

If the activity hazard analyses are modified to provide more stringent protective measures, then the TM, CSHM, and the SSHO/UXOSO shall determine the most appropriate upgrades to PPE. Employees will be notified of any PPE modifications by the SSHO/UXOSO.

If the activity hazard analyses are modified to provide less conservation protective measures then the TM, CSHM, and SSHO/UXOSO shall determine the appropriate downgrades based on observed site conditions. Employees will be notified of any PPE modifications by the SSHO/UXOSO.

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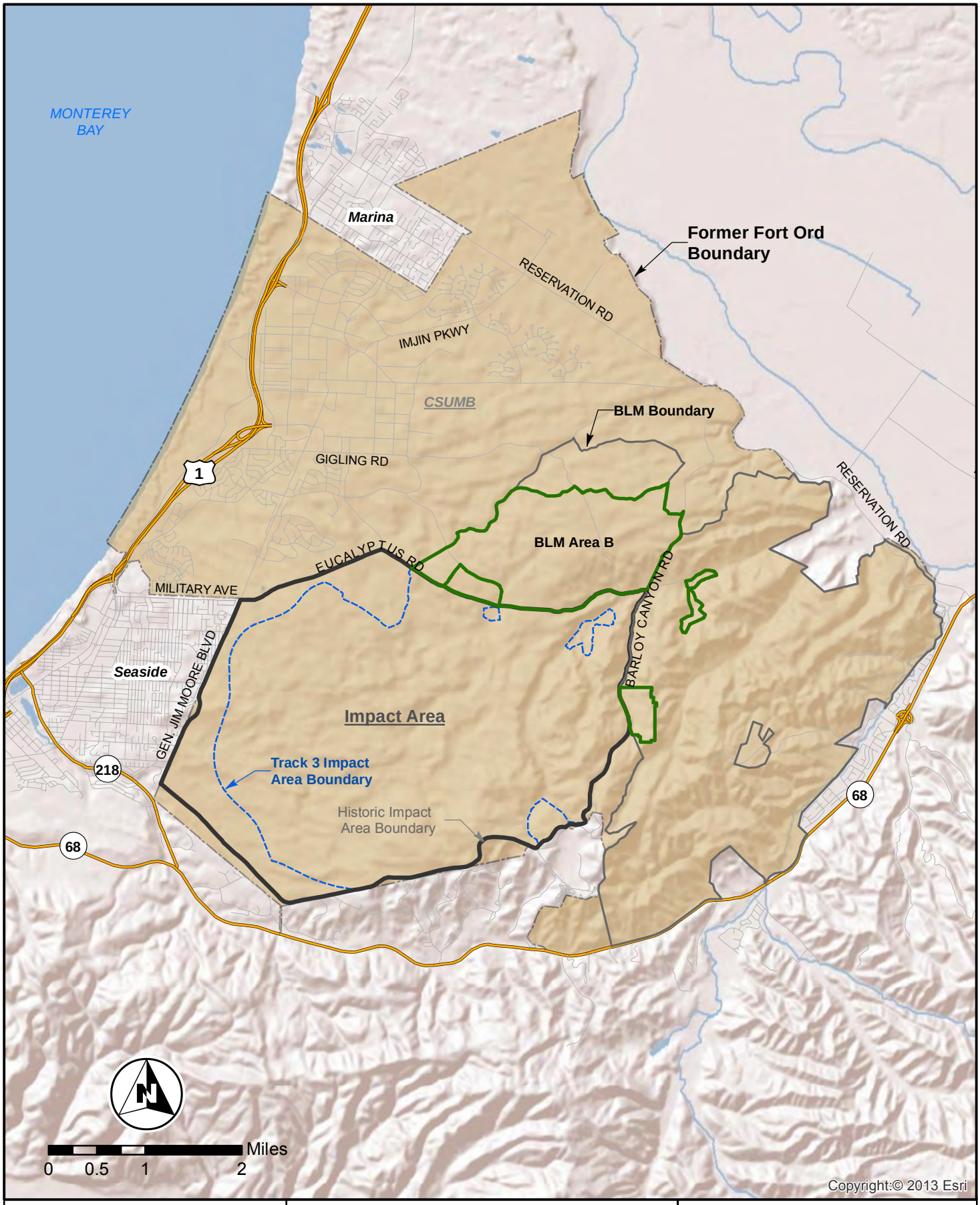

KEMRON ENVIRONMENTAL SERVICES

ACCIDENT PREVENTION PLAN
MEC REMOVAL AND SOIL INVESTIGATION
FORMER FORT ORD
MONTEREY COUNTY, CALIFORNIA

FIGURE 1

LOCATION MAP

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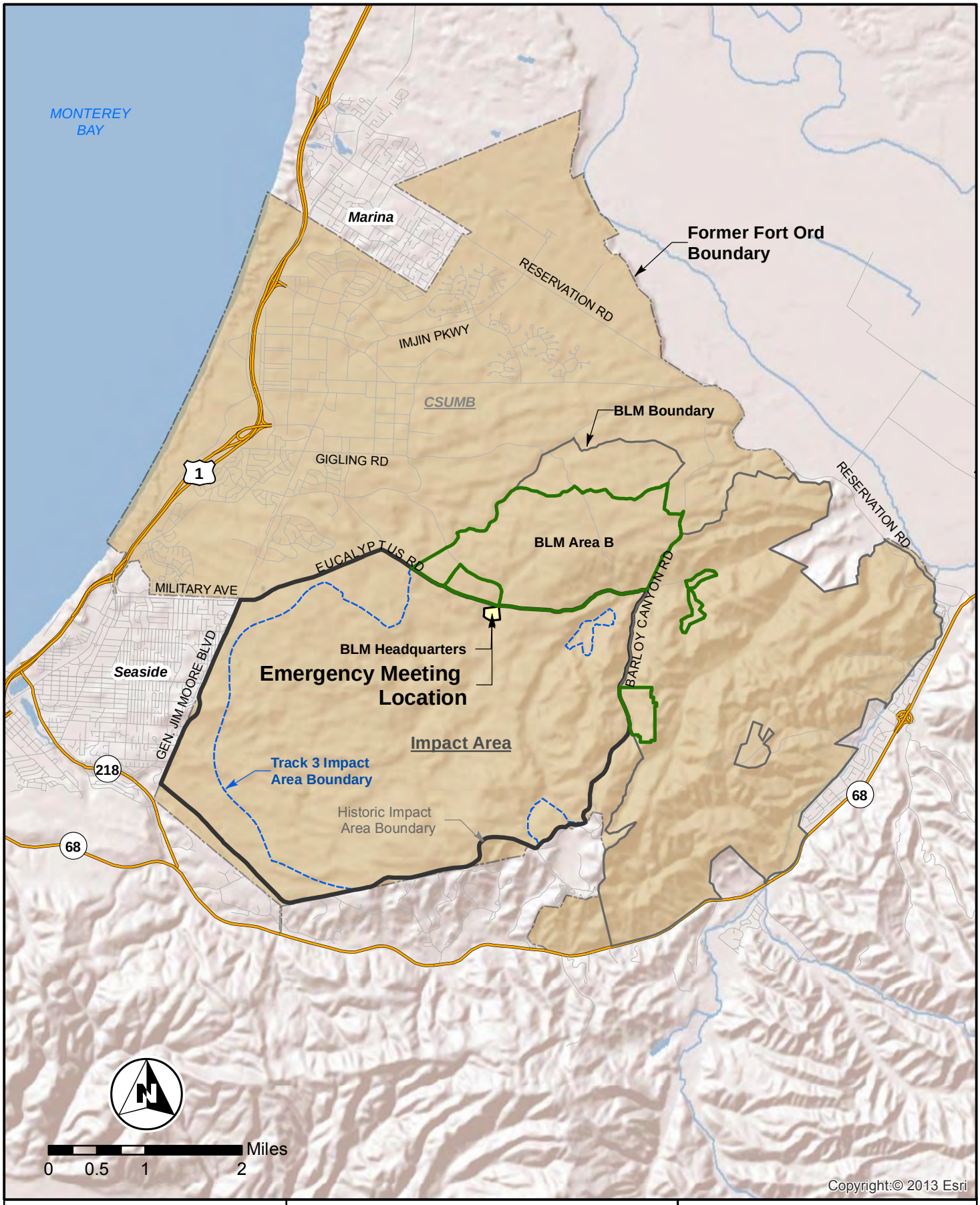

KEMRON ENVIRONMENTAL SERVICES

ACCIDENT PREVENTION PLAN
MEC REMOVAL AND SOIL INVESTIGATION
FORMER FORT ORD
MONTEREY COUNTY, CALIFORNIA

FIGURE 2
FORT ORD LOCATION MAP AND EMERGENCY MEETING LOCATION

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Appendix A

Site Safety and Health Plan

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SITE SPECIFIC HEALTH AND SAFETY PLAN
Munitions and Explosives of Concern Removal and Soil Remediation
Former Fort Ord, California

Date: February 2016
Version: Final, Revision 1

Prepared for

U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814

Contract No. W912DY-10-D-0027 Task Order CM01

Prepared by

KEMRON Environmental Services, Inc.
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Atlanta, GA 30318
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SDS for Fort Ord contaminants and chemicals to be used of concern. Additional SDSs will be updated by KEMRON personnel as materials are used or inventoried onsite.

Acronyms and Abbreviations

Acronym	Definition
ags	Above Ground Surface
AMP	Air Monitoring Plan
APP	Accident Prevention Plan
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
CIH	Certified Industrial Hygienist
COC	Contaminant of Concern
COPC	Chain of Custody
COC	Contaminant of Concern
CRZ	Contamination Reduction Zone
CSHM	Corporate Safety & Health Manager
CSP	Certified Safety Professional
dBA	Decimals
DD	Decision Document
DDESB	Department of Defense Explosives Safety Board
DMM	Discarded Military Munitions
DoD	Department of Defense
ESS	Explosive Safety Submission
GPS	Global Positioning System
HFD	Hazard Fragmentation Distance
HTW	Hazardous, Toxic Wastes
IDLH	Immediately Dangerous to Life and Health
KEMRON	KEMRON Environmental Services, Inc.
MD	Munitions Debris
MDEH	Material Documented as an Explosive Hazard
MEC	Munitions and Explosives of Concern
MGFD	Munitions with the Greatest Fragmentation Distance
MMRP	Military Munitions Response Program
MRA	Military Response Actions
NRMA	Natural Resource Management Area
OE	Ordnance and Explosives
PEL	Permissible Exposure Limit
POMFD	Presidio of Monterey Fire Department
PPE	Personal Protective Equipment
RD/RA	Remedial Design / Remedial Action
RDX	Cyclotrimethylenetrinitramine
RI	Remedial Investigation
RTK	Real Time Kinematic
SDS	Safety Data Sheets

Acronym	Definition
SSHP	Site Safety and Health Plan
SUXOS	Senior UXO Supervisor
TM	Task Manager
UXOSO	UXO Safety Officer
WERS	Worldwide Environmental Remediation Services
X-ray	Electromagnetic Radiation

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SECTION 1 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This Site Safety and Health Plan (SSHP) is intended to summarize and guide the site activities performed under the direction of KEMRON Environmental Services, Inc. (KEMRON) at the former Fort Ord, California Site for the Department of the U.S. Army. KEMRON's subcontractors will be required to develop, implement, and enforce site health and safety plans for their employees and subcontractors. KEMRON will review these plans to ensure conformance with the requirements of this SSHP. Additionally, KEMRON will maintain oversight of its subcontractors to ensure conformance with the requirements of this plan. All such plans are required to adhere to applicable requirements of 29 Code of Federal Regulations (CFR) 1910 and 29 CFR 1926, United States Army Corps of Engineers (USACE) EM385-1-1, and to KEMRON's SSHP.

Based on previous investigations completed by others, the former Fort Ord, California has been targeted for remediation activities as requested by the United States Department of the Army under the Worldwide Environmental Remediation Services Contract W912DY-10-D-0027 Task Order CM01. The scope of work includes the performance of prescribed burning in the Impact Area Military Response Actions (MRA) and Bureau of Land Management (BLM) Area B, vegetation clearance, boundary surveys, geophysical surveys, surface and subsurface Munitions and Explosives of Concern (MEC) removal, sifting operations, road improvements, and other preparatory activities.

1.1 Introduction

This document sets forth the health and safety guidelines and requirements developed for work to be performed by KEMRON at the former Fort Ord, California. The plan is designed to provide specific requirements and related measures necessary to protect on-site personnel, site visitors, and the public from physical harm and exposure to hazards resulting from the work to be conducted. The procedures and guidelines contained herein were based upon the best available information at the time of the plan's preparation. Specific requirements will be revised when new information is received, or site conditions change. A written amendment will document all changes made to the plan and amendments to this plan will be included as attachments. Where appropriate, specific Occupational Safety and Health Administration (OSHA), US Environmental Protection Agency standards and/or other sources of applicable guidance will be cited and applied.

Fort Ord is adjacent to Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Figure 1). The base consists of approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. Highway 1 passes through the western part of Fort Ord, separating the beachfront portions from the rest of the base. Laguna Seca Recreation Area and

Toro Regional Park also border Fort Ord to the south and southeast, respectively, as well as several small communities along Highway 68.

1.2 General Site Safety Rules

The following are standard safe work practices that apply to all site personnel and will be discussed in the safety briefing prior to initiating work on the site:

- All work will be performed in accordance with requirements and procedures described in the KEMRON Corporate Health and Safety Manual.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the work area.
- A "buddy system" will be used during all work activities. Hand signals will be established to maintain communication between work teams and personnel.
- Radio communication will be used to contact the KEMRON safety representative in the event of an emergency.
- During site operations, each worker will consider him - or herself as a safety backup to his or her partner. Off-site personnel will provide emergency assistance if needed.
- Visual contact will be maintained between "buddies" on site when performing hazardous duties.
- No personnel will be admitted to the site without having and wearing the proper personal protective equipment (PPE), all current and required training, and a medical surveillance certification.
- Authorized visitors must participate in a site-specific safety briefing and sign the visitor log prior to entering the work area. Unexploded ordnance (UXO)-related operations must cease prior to visitor entry to the work site. In the event emergency responders are called to the site, they will not require training or login; however, they will not be permitted into the Exclusion Zone (EZ) and they will only treat injured/contaminated workers outside of the EZ.
- All personnel must comply with established site safety procedures. Any staff member who does not comply with all site safety requirements, as established by the Site Safety and Health Officer (SSHO)/UXO Safety Officer (UXOSO), will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the site.
- Use of cellular telephones is prohibited in the work area with the exception of use as a backup means of communications for team leaders and managers only.
- All visitors must sign in and out of the site.

- All accidents and safety related incidents will be immediately reported to the designated SSHO/UXOSO.

1.3 Daily Safety Meetings

Daily meetings will be held at the start of each shift to ensure that all personnel understand site conditions and operating procedures, to ensure that required personal protective equipment is available and is being used correctly and to address any worker health and safety concerns. All new amendments to the SSHP, any accidents/incidents, and site/activity hazards will also be reviewed at these meetings. Each worker will sign the safety meeting form during the daily safety meeting. All visitors are to receive a site specific safety brief and sign the visitor's log. The daily safety meeting form and visitor's log, as well as other Fort Ord project appropriate forms are provided in Attachment 1.

1.4 Site Safety Plan Acceptance Acknowledgement

The Project Manager and/or the designated SSHO/UXOSO shall be responsible for informing all individuals entering the exclusion zone (EZ) of this plan and ensuring that each person reviews and signs the Safety Plan Acknowledgment Form. By signing the Safety Plan Acknowledgment Form, individuals are confirming that they have been made aware of the hazards present on-site, and the policies and procedures required to minimize exposure or adverse effects of these hazards.

1.5 Training Requirements

All personnel entering the EZ must have completed required training for hazardous site work in conformance to OSHA 29 CFR 1910.120, OSHA 29 CFR 1926 and in accordance with the employee's specific job assignments/tasks. Additionally, all employees working on remedial construction sites will receive Hazard Communication training per 29 CFR 1910.1200 prior to beginning work on the site. All KEMRON employees and subcontractors will receive company new employee and site orientation training, as listed in the Accident Prevention Plan (APP), along with a medical examination and clearance by a licensed health care professional or physician.

Additionally, all hazardous, toxic waste (HTW) field work performed by KEMRON and its subcontractors will be completed per the requirements of the approved SSHP. The SSHP will list the information needed and procedures required for the site work to be conducted safely and to ensure the health of all personnel working on site including subcontractors. Review and concurrence/approval of the SSHP will be coordinated with the local Fire & Emergency Services, the local hospital, and the Fort Ord Project Contact. MEC-related activities will be conducted in accordance with the Department of Defense (DoD) Ammunition and Explosives Safety Standards (DoD 6055.09-STD), Army Regulation 385-10, the Army Safety Program; Department of Army Safety Pamphlet 385-63, Range Safety; Department of Army Pamphlet

385-64, Ammunition and Explosives Safety Standards; and training and medical screening per 29 CFR 1910.120(e); and per the guidance set forth in DOD instruction 4140.62, OSHA 1910.120, and Department of Defense Explosives Safety Board (DDESB) Technical Paper 18.

Training will be conducted as shown in Table 1-1.

Table 1-1: Training Requirements

Training Requirements	Type of Training[1]	Personnel to be Trained
Site Health and Safety Plan	R	All
Pre-Job Start Health and Safety (H&S)/SSHP Briefing	F or C	All
H&S Tailgate Meetings	F	All
General Employee Training (new hire, annual, routine) – KEMRON provided	C	All on site for >10 consecutive days
40 hr. Hazardous Waste Operations and Emergency Response (HAZWOPER) Class and 24 hr. Supervised Fieldwork	C	General site workers per 1926.65(e)(3)(i).
8-hour HAZWOPER annual refresher	C	All – If about 1 year from the previous 40-hour HAZWOPER or 8-hour refresher training
Lead Awareness Training	C	All personnel working on sites where lead is a Contaminant of Concern (COC)
8-Hour HAZWOPER Supervisor	C	Project Manager, TM, and Corporate Safety & Health Manager (CSHM)
Fire Extinguisher	C	At least one field team member
First Aid/Cardiopulmonary Resuscitation (CPR)	C	At least two field team members
Bloodborne Pathogen (KEMRON Program)	C	First Aid/CPR Trained Personnel
Personal Protective Equipment (PPE) (Employer's Program and SSHP)	F	All
Employer Hazard Communication Program	R	All

[1] Types of Training: **R** = Read (Self) Training; **C** = Classroom Training; **F** = Field Training

All KEMRON employees, subcontractors' employees and site visitors must be trained in accordance with this SSHP prior to work assignment. In every case, appropriate training will include briefings by the Project Manager or SSHO/UXOSO on site hazards and work rules. In addition, the Project Manager or SSHO/UXOSO will require evidence of prior completion of mandatory training as applicable to the specific employee duties. KEMRON will maintain a file of training certificates or other documentation verifying that the applicable requirements have been met.

1.6 Medical Monitoring Requirements

All personnel entering the EZ must have completed appropriate medical monitoring requirements under OSHA 29 CFR 1910.120 (f). Subcontractors may be used for various segments of the work, and their medical requirements will be relative to their specific task, and subject to respirator use and fit testing. Documentation of medical monitoring is the responsibility of each employer. If there are additional medical monitoring requirements for the site, evidence of compliance for these requirements must also be included.

1.7 Fit Testing Requirements (Respiratory Protection)

Respiratory protection is not anticipated to be used during this project, as the action levels were established conservatively enough to maintain exposures to the site contaminants to well below their respective permissible exposure limit (PELs) through engineering and administrative controls.

1.8 Site Orientation Training

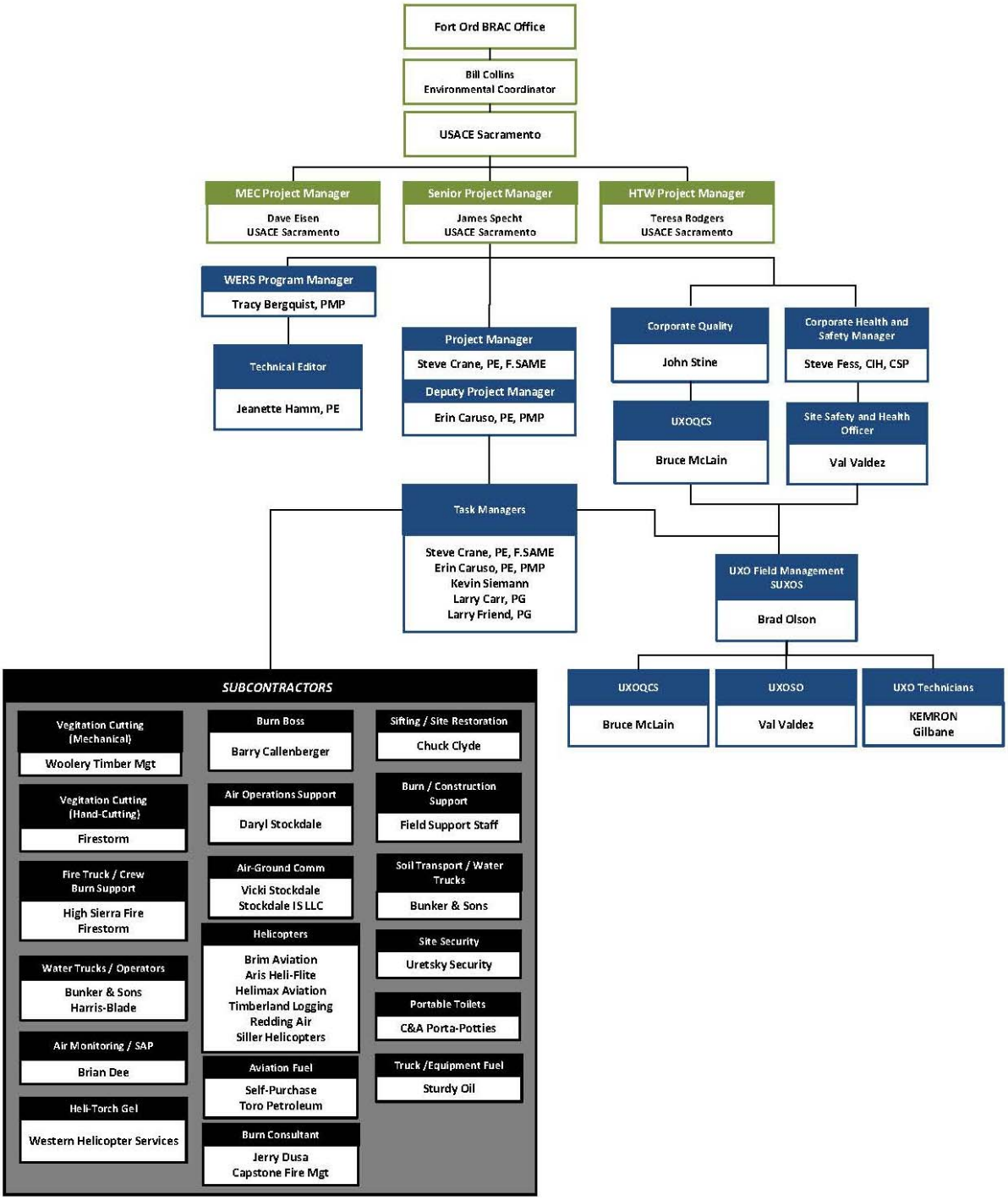
All personnel working on site shall attend site orientation sessions that include a review of the SSHP including site-specific safety rules and requirements, UXO items likely to be encountered on the site and UXO recognition (MEC Safety Awareness). Personnel accessing the site strictly for deliveries or administrative purposes are not required to attend this orientation training.

1.9 Delivery Personnel and Support Subcontractors

Personnel whose sole purpose is to deliver goods to the support zone shall not be required to meet the training and medical fitness requirements described in this section. Personnel performing site work strictly within the support zone and clean areas of the site or where safety and health hazards have been removed shall also not be required to meet the training and medical qualifications but shall attend the Site Orientation Training described in Section 1.6. The site orientation training shall cover the SSHP including site hazard communication information.

SECTION 2 RESPONSIBLE SITE AUTHORITY

2.1 Project Organizational Chart:



KEMRON project staff will include personnel from various departments within the organization. The following KEMRON and Gilbane employees will have critical roles in the safe execution of this project:

- KEMRON Program Manager: Tracy Bergquist, Project Management Professional (PMP)
- KEMRON Project Manager (PM): Steve Crane, PE, F.SAME
- KEMRON and Gilbane Task Managers (TMs): Steve Crane, PE, F.SAME; Erin Caruso, PE, PMP; Kevin Siemann; Larry Carr, PG; Larry Friend, PG
- KEMRON Corporate Quality Control Manager: John Stine
- KEMRON CSHM: Steve Fess, CIH, Certified Safety Professional (CSP)
- KEMRON Site Safety and Health Manager: Val Valdez (SSHO and UXOSO).
- KEMRON Senior UXO Supervisor (SUXOS): Brad Olson

KEMRON Program Manager: Tracy Bergquist

Tracy Bergquist is responsible for the progress of the work at the program level. She supervises all personnel to ensure appropriate employee performance for site work, health and safety compliance, completing accident/incident reports, and enforcing corrective actions. The program manager, or designee, will have work stoppage authority for the project. In addition, the Program Manager has the following responsibilities:

- Fostering an office-wide commitment to KEMRON's health and safety policy and goals;
- Supports the PM to ensure that safety and health requirements are met;
- Overall contract conformance to Army requirements and specifications, including technical, cost, and schedule;
- Allocation of sufficient resources to ensure successful completion of the project;
- Management of the project budget and schedule, with concurrence from the Army and regulators, thereby, ensuring project requirements are satisfied.

KEMRON Project Manager: Steve Crane, PE, F.SAME.

Mr. Crane is responsible for all day to day activities of the work at the project level and will have overall responsibility for project safety requirements. He supervises all project personnel to ensure that all on-site work is performed in compliance with the project specifications and maintains direct communication with the Program Manager and the CESPK Fort Ord COR. The PM will have work stoppage authority for the project. In addition, the PM directs the following:

- Communicating office-specific health and safety needs to the CSHM and SSHO/UXOSO, as appropriate;
- Directing audits of the administration of health and safety programs on job sites;
- Ensures compliance with the SSHP;
- Supports the Task Managers and SSHO/UXOSO to ensure that safety and health requirements are met;
- Reviews and approves the final reports and support files on the project activities;
- Overall responsibility for the success and proper execution of the project;
- Initiation of project planning and implementation of project.
- Management of the project budget and schedule, with concurrence from the Army and regulators, thereby, ensuring project requirements are satisfied.

KEMRON and Gilbane Task Managers: Steve Crane, PE, F.SAME; Erin Caruso, PE, PMP; Kevin Siemann; Larry Carr, PG; Larry Friend, PG

The Task Managers (TMs) are responsible for all day to day activities of the work at the task level. The TMs supervise all project personnel to ensure that all on-site work is performed in compliance with the project specifications and maintains direct communication with the PM. The TMs will have work stoppage authority for their respective projects. The TM, or competent temporary alternative, will directly supervise all on-site project activities and may be onsite during these of the project activities. In addition, the TM directs the following:

- Prepares and organizes the background review of the project specifications and WPs;
- Organizes the field team to ensure compliance with safety requirements;
- Ensures that project activities are defined and resulting hazards are identified along with control measures;
- Attempts to secure all resources necessary for the safe completion of assigned tasks;
- Obtains permission for the site access and coordinates activities with appropriate officials;
- Ensures compliance with the SSHP;
- Briefs the field teams on their specific assignments;
- Manages field operations;
- Executes the work plan and schedule;

- Enforces safety procedures and supports the SSHO/UXOSO to ensure that health and safety requirements are met;
- Coordinates with the SSHO/UXOSO in determining protection levels and potential upgrades/downgrades;
- Enforces site control;
- Documents field activities;
- Prepares the final reports and support files on the remedial activities;
- Management of all field construction activities, including the direction of project staff and subcontractors in accordance with project requirements;
- Tracking proposed changes to the project;
- Communicating directly with the PM regarding project execution and accountability;
- Coordination with the SSHO/UXOSO and Field Staff to ensure compliance with standard protocols and procedures and implementation of the task orders; and
- Procurement of equipment, material, and supplies.

KEMRON Corporate Quality Control Manager: John Stine

Mr. Stine is responsible for monitoring the progress of the work at the project level. He supervises all personnel to ensure appropriate employee performance for site work, health and safety compliance, completing accident/incident reports, and enforcing corrective actions. Directing audits of the administration of health and safety programs on job sites;

- Ensures compliance with the SSHP;
- Supports the CSHM and SSHO/UXOSO to ensure that safety and health requirements are met;
- Reviews and approves the final reports and support files on the project activities;
- Overall contract conformance to project requirements and specifications, including technical, cost, and schedule;
- Initiation of project planning and implementation of project.

KEMRON Corporate Safety and Health Manager: Steven K. Fess, Certified Industrial Hygienist (CIH), CSP

The CSHM is responsible for the development and administration of KEMRON's Corporate Environmental, Health and Safety Program. The CSHM will act as the Safety and Health Manager (SHM) for this project by providing continuous consultation with the PM, SUXOS, and UXOSO to maintain the proper implementation of the APP. The CSHM reports directly to the

Executive Vice President all health and safety issues. The CSHM is responsible for managing the SSHO/UXOSO and the development, oversight, and enforcement of the APP/SSHP. Corporate health and safety representatives may conduct site audits and inspections, but will not be on site during all project activities. Responsibilities of the CSHM include the following:

- Fostering a company-wide commitment to KEMRON's health and safety policy and goals;
- Develops and maintains health and safety standard operating procedures and policies;
- Reviews all accident/incident reports, and initiates additional investigation when necessary; and
- Obtains authorization to fund health and safety training and equipment.
- Provide safety and health support the project at the startup of the project, for major phases of work, and for task specific situations requiring additional oversight;
- Conduct, supervises, or directs periodic inspections/audits to determine if the APP is being followed;
- Supports the PM, TM, and SSHO/UXOSO during emergencies;
- Coordinates any modifications to the APP/SSHP with the SSHO/UXOSO and PM;
- Determines the appropriate PPE levels for each task, and works with SSHO/UXOSO on identifying appropriate downgrade/upgrade situations;
- Reviews and evaluates the air monitoring data and make decisions concerning engineering controls, work practices, and levels of PPE;
- Reviews the daily quality control reports and any accident/incident/near miss reports; and
- Serves as a member of the Contractor's quality control staff.

<u>KEMRON Site Safety and Health Officer and UXO Safety Officer: Val Valdez (SSHO and UXOSO).</u>

The SSHO/UXOSO is responsible for managing, implementing, and enforcing this APP. The SSHO/UXOSO role is considered equivalent to the SSHO role The SSHO/UXOSO will report site-specific safety issues and concerns to the PM, TM, and CSHM. The SSHO/UXOSO will be onsite at all times during project activities. He will be responsible for insuring daily compliance and implementation of the SSHP, including such issues as PPE, training, policy enforcement, health monitoring, and report preparation, among others. The SSHO/UXOSO is responsible for conducting the daily tailgate safety meetings, and also responsible for decontamination procedures, equipment, and supplies. As UXOSO, he will evaluate health and safety concerns

with respect to military munitions issues. He will provide information and help to develop specific guidance to ensure safe work practices on military munitions sites. Specific responsibilities include:

- Ensures that all personnel conduct project activities in accordance with the SSHP, and initiates disciplinary action for safety violations, in conjunction with PM and CSHM, as necessary;
- Informs KEMRON and subcontractor personnel of KEMRON health and safety policies and their application to potential hazards associated with specific site operations;
- Corrects work practices or conditions which may result in injury or exposure to toxic substances;
- Completes accident, injury, and illness investigation reports and notifies line management of all job-related illnesses or injuries;
- Coordinates on-site emergency response activities;
- Monitors all personnel performance for compliance with safe work practices, including the SSHP;
- Advises the CSHM of deviations from safe work practices and of methods to correct the problem;
- Continually evaluates environmental conditions: weather, chemical, physical, etc. and recommends necessary modifications, to the PM and CSHM, to ensure personnel safety;
- Conducts safety training and daily safety meetings;
- Ensures that all documentation necessary for health and safety programs is generated and maintained;
- May stop any activity on site and/or the entire operation when conditions immediately dangers to life and health are identified;
- Ensures protective clothing used is consistent with the requirements of the SSHP;
- Periodically inspects protective clothing and equipment;
- Ensures that PPE are properly stored and maintained;
- Controls entry and exit at the Access Control Points;
- Coordinates safety and health program activities with on-site essential personnel;
- Confirms each team member's suitability for work based on a physician's recommendations;

- Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue;
- Participates in the implementation of the SSHP;
- Enforces the "buddy" system;
- Set up decontamination lines and the decontamination solutions appropriate for the type of chemical contamination on site;
- Controls the decontamination of all equipment, personnel, and samples from the contaminated areas;
- Assists in the disposal of contaminated clothing and materials;
- Ensures that all required equipment is available. Advises medical personnel of potential exposures and consequences;
- Is aware of emergency procedures, evacuation routes, and the telephone numbers of the plant emergency services, ambulance service, local hospital, poison control center, fire department, and police department;
- Notifies, when necessary, local public emergency officials; and
- Coordinates emergency medical care.

KEMRON Senior UXO Supervisor: Brad Olson

The SUXOS will be responsible for overseeing and implementing MEC remedial operations and MEC avoidance operations. The SUXOS has the following responsibilities:

- Assist in the development of site-specific work plans
- Evaluate the sites to determine the level of support that is required to safely conduct the given operation
- Oversee UXO personnel that provide explosive ordnance recognition, escort, location, and safety functions during anomaly avoidance activities
- Make arrangements through the USACE for military munitions removal or disposal actions in the event that the work area is too contaminated with MEC/ Material Potentially Presenting an Explosive Hazard (MPPEH) to safely allow non-UXO personnel to work in the area
- Ensure that exact location of any military munitions related items encountered are accurately captured, with the aid of a digital global positioning system, and that those coordinates are properly reported and recorded in the geographical information system

- Ensure that suspect munitions response sites (MRSs) are clearly marked or delineated prior to HTW crews entering the area
- Ensure that MEC safety briefings are given to all site personnel and visitors
- Take operational control of a site until properly relieved, in the event hazardous MEC/MPPEH is encountered

Field Support Team

Depending on the size of the field team, any or all of the field team may be in the Work Party, but the Work Party should consist of at least two people. The field team members may consist of equipment operators, UXO technicians, environmental technicians, etc. The field team has the following specific responsibilities:

- Safely completes the on-site tasks required to fulfill the work plan.
- Complies with the SSHP.
- Notifies PM or SSHO/UXOSO of any unsafe work-place conditions or reportable safety incidents/accidents.

SECTION 3 SITE CHARACTERISTICS

3.1 Site History and Background

The former Fort Ord is adjacent to Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco. The base consists of approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. Highway 1 passes through the western part of the former Fort Ord, separating the beachfront portions from the rest of the base. Laguna Seca Recreation Area and Toro Regional Park also border the former Fort Ord to the south and southeast, respectively, as well as several small communities along Highway 68. Figure 1 illustrates the Site Location and Features for former Fort Ord.

Beginning with its founding in 1917, Fort Ord served primarily as a training and staging facility for infantry troops. Former Fort Ord was a basic training center from 1947 to 1974 and the 7th Infantry Division was activated at the former Fort Ord on 21 October 1974. The 7th Infantry Division was converted to a light division in 1983. Light infantry troops operate without heavy tanks, armor, or artillery. In 1991, Fort Ord was selected for closure and the post was officially closed in 1994. Remedial Investigations (RIs) and cleanup actions at the former Fort Ord have been performed and documented since 1986.

Before the Army's use of the property, the area was agricultural, as is much of the surrounding land today. The Army originally bought the present day East Garrison and nearby lands on the east side of the former Fort Ord in 1917 to use as a maneuver and training ground for field artillery and cavalry troops stationed at the Presidio of Monterey (POM). No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed.

In 1938, additional agricultural property was purchased for the development of the Main Garrison. At the same time, the beachfront property was donated to the Army. The Main Garrison was constructed between 1940 and the 1960s, starting in the northwestern corner of the base and expanding southward and eastward. During the 1940s and 1950s, an area within the Main Garrison was utilized as a small airfield. In the early 1960s, construction of the Fritzsche Army Air Field was completed. The smaller Main Garrison airfield was then decommissioned, and its facilities were redeveloped as motor pools and other facilities.

3.1.1 Impact Area Munitions Response Area

The Impact Area MRA includes a large number of ranges that have various historical uses, designs, and characteristics (MACTEC, 2007). Over the years, various types of munitions have been used during training activities within the Impact Area MRA, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms. Select ranges were used for small arms training activities only, while other ranges are characterized as multi-use. The firing ranges

were located along the perimeter of the Historical Impact Area such that weapons firing activity was generally directed toward the center of the Historical Impact Area. The Historical Impact Area encompassed an area bounded by Eucalyptus Road to the north, General Jim Moore Boulevard to the west, South Boundary Road to the south, and Barloy Canyon Road to the east. Training activities at the Impact Area MRA ceased after the closure of the former Fort Ord in 1994.

3.1.2 BLM Area B

BLM Area B East is in the northeastern portion of the former Fort Ord. The property was purchased from private landowners by the government in 1917. The Track 2 Munitions Response Sites (MRSs) in the northern portion include MRS-12 and MRS-21, comprising approximately 43 acres. The Track 2 MRSs in the southern portion include MRS-14D (including small portions of MRS-14B and MRS-14E), MRS-25, and MRS-26, covering approximately 98 acres.

BLM Area B North is in the northeast-central portion of the former Fort Ord north of Eucalyptus Road. The MRSs located in this area include: MRS-09, MRS-10A, MRS-10B, MRS-19, MRS-27I, MRS-41, MRS-48, MRS-54, MRS-56, MRS-58, MRS-27H; portions of MRS-53BLM, MRS-27G, and MRS-27J Additional areas adjacent to and in-between the MRSs are included in BLM Area B North.

3.1.3 Basewide Range Assessment

A majority of Site 39 is encompassed within the footprint of the Impact Area MRA. Over the years, various types of ordnance have been used or found in the Inland Ranges, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms ammunition. Some training activities using petroleum hydrocarbons also were conducted. The 2.36-inch Rocket Range north of the Impact Area MRA reportedly was used for anti-armor (bazooka) training during and shortly after World War II.

The proposed future use of most of the Inland Ranges will be as a Natural Resource Management Area (NRMA) and as habitat reserve areas. These areas will be managed by the U.S. Department of the Interior, BLM, and public access will be restricted. Several areas within - but along the periphery of- the Inland Ranges, have a proposed future land use other than as an NRMA. The Military Operations on Urban Terrain Area, near the northeastern edge of the Inland Ranges, is proposed for use as a peace officer training area. The areas along the southern and western boundaries of the Inland Ranges are designated for future development under the Reuse Plan and Habitat Management Plan.

The remedial action for the Site 39 Inland Ranges at the former Fort Ord was originally identified in the Record of Decision, Basewide RI Sites, Fort Ord, California dated January 13, 1997 (Army, 1997). The 1997 Record of Decision (ROD) serves as the Basewide ROD. The selected remedy identified in the Basewide ROD addressed the risks to human health from lead

contamination in soils co-located with bullets, bullet fragments, and explosive constituents in soils from MEC usage at the Site 39 Inland Ranges. The Basewide ROD identified the selected remedy for the Site 39 Inland Ranges as "Excavation and Onsite Placement at the Operable Unit 2 Landfill Beneath a Cap" at the former Fort Ord based on the protection of human health for reuse of the site as a habitat reserve. The remedy implementation at select ranges is discussed in the Final Site 39 Remedial Action Completion Report (Gilbane, 2014).

The Comprehensive Basewide Range Assessment (BRA) Report summarized the status of site investigation for the presence of contaminants of potential concern (COPCs) (metals and explosives) at known or suspected small arms ranges, multi-use ranges, and military munitions training areas within the former Fort Ord, including those within Site 39 (MACTEC/Shaw, 2012).

The objective of the Comprehensive BRA investigation activities described in the report was to (1) ascertain whether the COPCs could be present in sufficient amounts to necessitate remediation, and if remediation was warranted based on available information, to determine the area(s) within a site where remediation should be recommended; (2) identify which ranges can be eliminated from consideration for potential remediation; and (3) identify sites that require additional investigation, or should be considered for remediation.

The Comprehensive BRA process involved five steps: (1) review of historical documents including historical training maps, historical aerial photographs, range control records, and military munitions after action removal reports; (2) site reconnaissance and mapping; (3) limited soil sampling for screening purposes; (4) site characterization; and (5) remediation/ habitat mapping. This investigation identified areas of additional soil contamination associated with ranges within Site 39 and resulted in a significant increase in the volume of soil to be excavated at the site.

Under the Comprehensive BRA, soil sampling within Site 39 will occur as necessary following the remaining MEC remediation actions and site investigation. Additional areas may be identified following MEC remediation being conducted in accordance with the Site 39 Inland Ranges Habitat Restoration Plan, in accordance with the Final ROD Amendment issued by the Army on August 25, 2009 (Army, 2009).

3.1.4 Scope of Work – RD/RA Impact Area MRA MEC Remediation and BLM Area B

Prescribed burning will be performed as part of the selected remedy in the Track 3 ROD and BLM Area B for clearing vegetation from lands impacted by MEC from past Fort Ord training activities, so that surface removal of MEC and munitions debris (MD), digital geophysical mapping (DGM) surveys, and subsurface MEC removal can proceed in the safest and most expeditious manner possible. Prescribed burning will be performed as the optimal vegetation clearance approach for protecting the Central Maritime Chaparral at the site.

Road Improvements and Other Preparatory Activities

Road improvements will be completed prior to each prescribed burn to facilitate road use by Presidio of Monterey Fire Department (POMFD) and ground support equipment. The extent of road improvements will be minimized to protect environmental resources. Other infrastructure activities will be completed to safely conduct prescribed burns include Marina Airport use permitting, perimeter security enhancements, specialty tank procurement and fabrication (if needed), optimal placement of dip tank stations and infrastructure, and Impact Area MRA helipad maintenance.

Primary Containment Line Preparation

In preparation for prescribed burns, primary containment lines will be established based upon the munition with the greatest fragmentation distance (MGFD) associated with the unit. These preparation activities are intended to maintain the fire within unit boundaries and to protect ground crews from not only the fire itself but also potential exploding ordnance during burns. Interior boundaries of the primary containment lines will be established using the Hazardous Fragment Distance (HFD) of the MGFD. Primary containment lines will be detailed in the POMFD Prescribed Burn Plan. The HFD will be surveyed and staked from the perimeter road boundaries into the interior of the unit/area to delineate the extent of mastication required for the prescribed burn primary burn lines. Frequency of staking is typically 200 feet, but will be determined in the field by the density/height of brush and changes in sightline. Stakes that delineate the extent and direction of mastication will be clearly visible from mastication equipment.

Vegetation in primary containment lines will be masticated, generally in a two-stage cut. The first cut will be to 18-24 inches above ground surface (ags), which will allow UXO escort personnel to safely mark or remove MPPEH items or other non-explosive hazards, such as wire and target debris, on the ground surface to avoid mastication equipment contact with these hazards. The second cut will be to a maximum height of 6 inches ags to allow access for DGM equipment. Contact with the ground surface by mastication cutting heads will be minimized due to potential presence for shallow subsurface MEC. If additional mastication is required beyond primary containment lines to augment fire control lines, the same safety restrictions will be in place. Manual limbing of oak trees to a height of six feet and removal of combustibles (e.g., tires, wood structures) will be completed as required by POMFD.

Surface MEC Removal Within Primary Containment Lines

Technology-aided surface removal of MEC and MD within the primary containment lines will occur following preparation of the primary containment lines. The entirety of containment line preparation will not necessarily have to be complete prior to the onset of surface MEC removal work; however, safe distances from mastication equipment and safe UXO team separation distances will be factored in to the start of surface MEC removal if containment lines are still being prepared. If additional mastication is required in other areas to reinforce primary

containment lines, the same surface MEC removal procedures will be followed. Target and debris removal within primary containment lines will occur in conjunction with surface MEC removal task.

Prescribed Burn Operations

The Burn Boss will work with the POMFD Burn Manager in planning each prescribed burn and will manage the active ignition and suppression operations from the air. Other key subcontractors to be procured are an Air Support Group Supervisor; United States Forestry Service-certified companies to conduct aerial fire ignition and suppression operations using helicopters; an air to ground communications company to maintain pilot and ground communication and spatial separation of air traffic; a wildland firefighting firm to provide ground units; and a California Department of Forestry-certified water tender subcontractor.

UXO-qualified staff, including the UXOSO and SUXOS, will provide UXO safety coordination with POMFD during prescribed burn operations. Project personnel will also staff Impact Area MRA access points as needed to allow authorized equipment access, and to ensure there is no unauthorized entry. Fuel for refilling the heli-torch used for vegetation ignition will be provided at the ignition helipad location (Range 30A or alternate location) to ensure that no temporary stoppage of ignition activities occurs that may result in increased smoke impacts in the nearby residential areas due to plume collapse. Fuel for trucks to transport support personnel provided by will be available at the field office, and trucks will be filled each morning prior to the start of prescribed burn operations.

Vegetation Clearance

Post-burn mechanical mastication will be required to remove remnant vegetation, either burned or unburned in areas where surface and subsurface MEC removal is planned. The majority of post-burn mastication will be a single stage cut to a maximum height of 6 inches ags in areas where the ground surface is clearly visible by UXO escort personnel and masticator operators. For safety reasons, limited areas within a unit will require a two-stage cut during post-burn mastication where vegetation clearance via prescribed burning is not complete and the ground surface is obscured. Units where vegetation clearance via mechanical mastication occurs in lieu of prescribed burning will generally require two-stage mastication, unless the ground surface is clearly visible due to light vegetation.

Grid/Boundary Survey

Following vegetation clearance, grid survey and staking will occur for MEC removal. Grids will be established via Global Positioning System (GPS) on the Fort Ord Master Grid System of 100-foot by 100-foot grids, and will be used for tracking of MD/ Range Related Debris (RRD)/ ordinance debris weights, MEC finds, and other remedial action data, such as features to assist determination of where BRA sampling may occur.

Technology-Aided Surface MEC Removal

Following grid staking, technology-aided surface MEC removal will be performed by seven-person teams of UXO technicians. Lines with 5-foot spacing will first be established across each grid previously surveyed and staked as described above. UXO-qualified personnel will carry and use Schonstedt magnetometers across these lines to detect surface MEC and MD for removal. In addition to MEC and MD removal, target and debris removal will occur.

Management of MPPEH in BLM Area B

In accordance with EM 385-1-97a, MPPEH deemed safe to move will be removed at the end of each field work day from the BLM Area B remedial action work area and transported to the Impact Area MRA. This operation is planned due to the location of BLM Area B outside the Impact Area MRA and the presence of only temporary fencing around BLM Area B work areas. Road access will be blocked by UXO team members to ensure public safety during MPPEH transport operations across Eucalyptus Road. MPPEH transported to the Impact Area MRA will be incorporated into routine demolition operations for remedial action work proceeding within the Impact Area MRA. The details of this process for MPPEH removal will be outlined in the approved Explosive Safety Submission (ESS) as required by DA Pam 385-64. The approved ESS will serve as written affirmation of this process and a copy of the ESS will accompany each transport. The location of final disposition for the MEC items will be tracked in the project database.

If MPPEH that is unsafe to move is encountered, security personnel will remain with the item until demolition operations can proceed. Procedures to allow for expedited approval and completion of demolition operations involving MPPEH items that are unsafe to move will be included in the BLM Remedial Design/Remedial Action (RD/RA) Work Plan.

Geophysical Surveys

The geophysical team will use DGM to provide a subsurface anomaly map of all completed areas to assist with any subsurface MEC removal and future land use planning. DGM data methods will be collected using multi-overlapping sensor towed arrays coupled with real-time kinetic (RTK) GPS-enabled navigation software. This will allow the DGM teams to monitor site coverage in real time, thereby increasing overall efficiency and reducing the need for fill-in surveys.

Subsurface MEC Removal

Following surface MEC removal and DGM, a Technical Memorandum will be completed in which subsurface MEC removal may be recommended. For areas with 300 or less subsurface anomalies per acre, it is expected that this task will consist primarily of DGM-based subsurface MEC removal. Anomalies selected for intrusive investigation will be reacquired using RTK GPS or conventional survey equipment, or by measuring tapes from known grid coordinates in areas

where GPS use is not feasible due to tree canopy. The reacquisition team, composed of a geophysicist and a UXO Technician II, will document the pre-investigation anomaly milliVolt responses and the lateral offset of each reacquired anomaly from the initial DGM anomaly position. Anomalies will then be investigated, with intrusive results being entered into digital devices, and removed by a dig team composed of a UXO Technician III, a UXO Technician II, and two UXO Technician I's.

If an anomaly density significantly higher than 300/acre is encountered, mag and dig subsurface MEC removal may be performed. Procedures for mag and dig subsurface MEC removal are industry standard and will be addressed as part of the Unified Federal Policy – Quality Assurance Project Plan and the site specific work plans to allow for implementation in the field as needed.

Sifting

Subsurface MEC removal may require sifting in limited areas with a high density of subsurface anomalies and munitions with sensitive fuzing to meet Track 3 ROD requirements, or sifting may be conducted based on requests from the future land owner (through the USACE). Based on the MGFD selected for the area where sifting is required, one of two sifting methods will be selected to ensure equipment operators can conduct sifting operations safely and effectively. The two methods are armoring a long-reach excavator and other equipment in accordance with current DDESB Fragmentation Data Review Forms, or use of remotely operated sifting and support equipment in areas where protection of equipment operators is infeasible.

At the completion of sifting activities, site restoration will be conducted through erosion control measures to include placement of silt fencing and straw crimping with certified weed-free rice straw.

Munitions/Range-Related/Other Debris Recycling/Disposal

All Munitions Debris will initially be classified as MPPEH. Following initial classification, the MPPEH will be certified by the SUXOS, UXO QC Specialist and USACE Ordnance and Explosives (OE) Safety Specialist as either material documented as safe (MDAS) or material documented as an explosive hazard (MDEH). All MDAS will be inspected and certified free from explosive material and stored in lockable roll-off containers. All MDAS will be demilitarized as appropriate, and then transported to a recycling facility. DD Form 1348-1A documentation will accompany the MDAS.

MDEH will be treated in the same manner as MPPEH until the explosive hazard is eliminated as part of routine demolition operations. At that point the material will be classified as MDAS and will be handled as such. In the event that MDEH cannot be rendered as MDAS, such as explosives contaminated soils, chain of custody documentation of MDEH will be maintained, and transfer and release of MDEH will occur only to a Department of Defense qualified receiver.

RRD will be inspected and certified free from explosive material. RRD will be transported to a recycling or disposal facility as appropriate, and DD Form 1348-1A documentation will be completed. Other Debris will be transported to a recycling or disposal facility as appropriate. In all phases of debris recycling described above, KEMRON will maximize the return of recycling proceeds to the government through competition among recyclers.

3.1.5 Units 13, 17 and 20 Investigations

An investigation will be implemented to delineate areas within Units 13, 17, and 20 where remedial actions are required, and where only limited or no munitions training occurred to confirm no remedial actions are required. This area is subject to the requirements of the Track 3 ROD.

The fieldwork includes cutting of transects, and physical digital geophysical mapping of, 25% of each unit's total area for MEC. It also includes the detection of an estimated 300 anomalies per acre and intrusive investigation of 75 anomalies per acre.

3.1.6 Basewide Range Assessment

Hazardous and Toxic Wastes activities at the former Fort Ord within the Impact Area and BLM Area B are subject to the ROD for Basewide RI Sites as amended in 2009 which requires a determination if soils at the area exceed cleanup values and must be excavated and transported to the Operable Unit 2 Landfill Area E for disposal. Following MEC remediation the Impact Area and BLM Area B shall be characterized for soil contamination. These characterizations are to be accomplished in accordance with the BRA Program.

UXO field crews will document areas of high concentrations of MEC (both surface and subsurface), high concentrations of bullets, targets, or stained soil as areas that may require additional investigation. Spatial coordinates, sampling results, and site specific remarks will be entered into the database to easily identify these areas. These data will be evaluated in a timely manner to determine whether additional sampling is required to fully characterize an area with respect to potential soil contamination from military munitions.

SECTION 4 PERSONAL PROTECTIVE EQUIPMENT

4.1 Description of Protection Levels

Engineering controls will be employed to eliminate and/or minimize exposure potential to the extent practicable. Where engineering controls alone cannot reduce exposure potential to less than published exposure limits, PPE will be employed. Air monitoring will be performed to determine the appropriate action level of PPE for each project task.

LEVEL A

Note: Use of Level A is not anticipated to be necessary for completion of tasks on this project.

LEVEL B

Note: Use of Level B is not anticipated to be necessary for completion of tasks on this project.

LEVEL C

Note: Use of Level C is not anticipated to be necessary for completion of tasks on this project.

MODIFIED LEVEL D

Note: Modified Level D is the upgrade from Level D where additional protection is warranted from potential contact with impacted materials. Modified Level D will provide the appropriate skin protection when typical dermal exposure is expected.

LEVEL D

The minimum level of protection for personnel working on site is Level D PPE.

During activities where skin contact is a potential exposure mechanism, such as during activities that may involve direct contact with contaminated materials, Tyvek coveralls, nitrile gloves, and chemical-resistant boots will be utilized. Tyvek coveralls will prevent contaminated dirt including lead contaminated soil from getting onto employee's work clothing, being transferred in their vehicles, and taken home. These coveralls do not protect against wet materials. If contact with wet materials is a possible, polyethylene-coated Tyvek coveralls and chemical-resistant boots and gloves will be required. Chemical goggles or safety glasses in conjugation with a face shield will be worn during all activities with a splash potential.

Respiratory protection is not anticipated to be used during this project, as the action levels were established conservatively enough to maintain exposures to the site contaminants to well below their respective PELs through engineering and administrative controls.

EQUIPMENT REQUIRED**:**

- Standard Work Uniform
- Protective/Safety toe work boots (Composite)
- Safety glasses w/ Side Shields
- Hard hat (When an overhead hazard exists or working around heavy equipment)
- High-Visibility (American National Standards Institute Class 2) vest/garment
- Gloves (Cotton or Leather Palm Work)

OPTIONAL:

- Gloves (Nitrile)
- Hearing Protection
- Tyvek Suit (Plain)
- Face shield or Chemical Splash Goggle
- Coveralls (*Fire Resistant Coveralls or other protective clothing may be worn to prevent exposure to poison oak*)
- Hearing Protection (plugs or muffs if sound pressure levels will exceed 85 dBA during work activities)

PROTECTION PROVIDED:

- Level D provides minimal skin protection for splashes or chemical contact. Modified Level D provides increased skin protection.

SHOULD BE USED WHEN:

- The atmosphere contains no immediate hazard.
- Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemical.
- Modified Level D should be used when no atmospheric hazards exist but potential for dermal exposure is expected.

LIMITING CRITERIA:

- Level D should not be worn in the exclusion zone. (Unless deemed acceptable by SSHO/UXOSO).
- No respiratory protection provided.

TRIGGERS RESULTING IN UPGRADING PPE:

- Potential for dermal contact where Level D is no longer appropriate, and/ or a protective suit is necessary.
- Modifications to scope of work or task where potential exposure is increased and PPE is no longer appropriate.
- When atmospheric conditions change and respiratory protection is necessary.
- New monitoring information indicating that suspected dermal or inhalation hazard mandates upgrading PPE.

4.2 Task-Specific Levels of Protection

Table 4-1: Field Activities

MILITARY MUNITIONS RESPONSE PROGRAM (MMRP) FIELD ACTIVITIES COVERED UNDER THIS PLAN				
TASK DESCRIPTION	**TYPE**	**PRIMARY**	**CONTINGENCY**	**APPLICABLE TASKs**
1. Plan Preparation	Non-Intrusive	N/A	Modified D	-Document Generation and Site Meetings
2. Mobilization	Non-Intrusive	D	Modified D	-Transportation of personnel and equipment -Loading/Unloading and Staging Equipment
3. Site Preparation / Survey / Escorting	Intrusive	D	Modified D	-Site Survey -Utility Location -Escorting Personnel
4. Brush Clearing	Intrusive	D	Modified D	-Equipment operation -Hand clearing -Prescribed Burns
5. Surface/ Subsurface Clearance / EM61MK2 Survey	Intrusive	D	Modified D	-Use of handheld analog metal detector to clear to 6" ags -Utility Location -Identification and marking of surface MEC/CWM
6. Anomaly Detection and Excavation	Intrusive	D	Modified D	-Inspection of subsurface scrap for MEC -Excavation
7. Mechanical Soil Screening	Intrusive	D	Modified D	-Use of trammel and conveyors to screen and separate MEC

MILITARY MUNITIONS RESPONSE PROGRAM (MMRP) FIELD ACTIVITIES COVERED UNDER THIS PLAN				
TASK DESCRIPTION	**TYPE**	**PRIMARY**	**CONTINGENCY**	**APPLICABLE TASKs**
8. MEC Disposal	Intrusive	D	Modified D	-Electromagnetic Radiation (X-ray) of selected potential MEC -Conduct demolition operations -Demilitarization
9. MPPEH Certification and Shipping	Intrusive	D	Modified D	-Inspect MPPEH -Prepare/load containers
10. Soil Sampling	Intrusive	D	Modified D	-Soil Sampling
11. Site Restoration	Intrusive	D	Modified D	-Removing site temporary access features (fencing) -Backfilling sifted soil and final Grading -Vegetative Cover Placement
12. Demobilization	Intrusive	D	Modified D	-Breakdown equipment -Transportation of personnel and equipment

Activity hazard analysis for the project tasks are provided as Attachment 2.

SECTION 5 SITE HAZARDS

Additional information on site hazards and safety is included within this Section.

5.1 Chemical Hazards

This section outlines the potential chemical hazards associated with the project. During the project activities, employees may be exposed to the site contaminants and chemical products brought on site for the work.

5.1.1 Chemical Hazards Summary

The primary chemicals of potential concern for the present work are metals (lead) and potentially explosives in soil. Although these compounds have been detected at various concentrations in soil, they are not expected to pose a significant health risk during the project activities, and exposure may be controlled through basic hygiene procedures and administrative controls.

Monitoring of these materials will be used to assess the overall potential for chemical exposure. If differing conditions are observed, additional assessment may be warranted. Safety Data Sheets (SDSs) for the Contaminant of Concern (COCs) are provided in Attachment 3.

A list of the contaminants of concern at the site is identified below. Their exposure limits, routes of exposure, and symptoms of overexposure are listed in Table 5-1. Exposure for these chemicals may occur through inhalation of contaminated airborne particulates, skin contact or absorption, or through ingestion due to poor work practices and/or poor personal hygiene practices.

5.1.2 Chemicals of Concern Quick Reference

COCs associated with KEMRON's proposed scope of work and the associated exposure limit, immediately dangerous to life and health (IDLH), routes of exposure, and target organs is provided in the COC Quick Reference Table (Section 5.1.2).

Table 5-1: COC Quick Reference Table

Contaminants of Potential Concern	TLV/PEL	Potential Routes of Exposure	Target Organs	Symptoms
Lead	0.05 mg/m^3 (TLV/PEL)	inhalation, ingestion, skin and/or eye contact	Eyes, gastrointest-inal tract, central nervous system,	lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles;

Contaminants of Potential Concern	TLV/PEL	Potential Routes of Exposure	Target Organs	Symptoms
			kidneys, blood, gingival tissue	encephalopathy; kidney disease; irritation eyes; hypertension exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]
Cyclotrimethylenetrinitramine (RDX)/Cyclonite	0.5 mg/m^3 (TLV)	inhalation, skin absorption, ingestion, skin and/or eye contact	Eyes, skin, central nervous system	irritation eyes, skin; headache, irritability, lassitude (weakness, exhaustion), tremor, nausea, dizziness, vomiting, insomnia, convulsions
2,4,6-Trinitrotoluene	1.5 mg/m^3 (PEL) 0.1 mg/m^3 (TLV)	inhalation, skin absorption, ingestion, skin and/or eye contact	Eyes, skin, respiratory system, blood, liver, cardiovascular system, central nervous system, kidneys	irritation skin, mucous membrane; liver damage, jaundice; cyanosis; sneezing; cough, sore throat; peripheral neuropathy, muscle pain; kidney damage; cataract; sensitization dermatitis; leukocytosis (increased blood leukocytes); anemia; cardiac irreg
cyclotetramethylene-tetranitramine	0.5 mg/m3 (TLV) Taken from RDX (Cyclotrimethylenetrinitramine).	inhalation, skin absorption, ingestion, skin and/or eye contac t	Hepatic (Liver), Neurological (Nervous System)	irritation eyes, skin; headache, irritability, lassitude (weakness, exhaustion), tremor, nausea, dizziness, vomiting, insomnia, convulsions

OSHA PEL - Permissible Exposure Limit (8-hour day)
TLV - Threshold Limit Value (8-hour day)
mg/m^3 – milligrams per cubic meter
ppm – parts per million

5.1.3 Chemical Products

The chemical products to be used on site may include treatment chemicals (i.e.: sodium lactate) fuels and lubricants for equipment, spray paints, and calibration gases. Personnel exposure to these materials may occur through inhalation of vapors or airborne particulates, direct contact with materials and subsequent absorption, ingestion due to poor work practices and/or poor personal hygiene practices.

Isobutylene gas is used for calibration of direct-read instruments, and will be brought on site in extremely small quantities (e.g., a 1-pound compressed air cylinder). Exposure may occur through inhalation; however, exposures are expected to occur only at low concentrations and only during calibration activities. Isobutylene is a simple asphyxiant and is non-toxic; as such, there is no PEL. No specific air monitoring is anticipated for this gas, as the exposure to project staff is expected to be insignificant.

A SDS will be obtained for each chemical product brought on site. Each employer shall assure that all site personnel handling such materials or working close enough to be exposed to the materials are familiar with the contents of the SDS and any specific precautions needed to work safely with the materials.

Fuels handled on site may consist of diesel and gasoline. In addition, spray paint propellants and mastic removers typically consist of solvents. The fire hazards associated with these materials will be addressed as discussed in the Physical Hazards section. Personnel will utilize the appropriate storage and handling precautions and protective equipment, including handling these materials only in well-ventilated areas, preventing spillage, and storing in ventilated areas away from incompatible materials.

5.2 Physical Hazards

Slips, Trips, Falls - Good housekeeping will be maintained at all work sites. Trip hazards will be removed, marked, or guarded. Extreme caution shall be used when working on or around slippery surfaces. Use of disposable boot covers is discouraged when working on slick surfaces. All necessary precautions will be taken to prevent personnel from injuries caused by slippery surfaces and trip hazards.

Back Strain - Proper lifting techniques shall be used when handling heavy or bulky loads. Personnel shall lift with legs, keeping back straight, and loads close to their bodies. Avoid twisting at the waist during lifting. Personnel shall request and receive help from others when loads appear to be too heavy. Mechanical means is the preferred method of lifting and should be used whenever possible.

Overhead Hazards - Investigation of a work area must be conducted before any work is to begin. Proper clearances must be maintained at all times. Equipment shall not deviate from established travel ways or work areas where clearances are unknown/ insufficient.

Buried Utilities - All buried utilities shall be identified and marked before any intrusive work begins in the work area. At no time shall a buried utility be attempted to be located by mechanically powered excavating equipment. Buried utilities shall be located by hand excavation.

Heavy Equipment - Daily inspections/pre operational checks of heavy equipment will be conducted to insure all safety and operating mechanisms are in place and working properly (i.e., backup alarm, fire extinguisher, brakes, controls, etc.). This inspection will be documented and kept on file for review. Ground personnel shall communicate with the operator before he enters and after he leaves that operator's work area. The swing radius of any piece of equipment must be established and at no time are ground personnel to enter that area when the equipment is in operation. Only qualified personnel are allowed to operate equipment.

Excavation/Trenching – If excavation or trenching is required, a competent person (trained in accordance with OSHA and KEMRON requirements) on site will perform the soil characterization and inspect the sloping, shoring, and/ or other appropriate safeguards. KEMRON Excavation, Trenching, and Shoring procedures will be used if required.

Confined Space - In the event that there are confined spaces present at the job site, KEMRON and OSHA compliant Confined Space Entry procedures covering air monitoring, training, entry permit, rescue, and PPE must be reviewed and followed. At no time shall any personnel be allowed to enter a confined space until all criteria as stated by the KEMRON Confined Space Entry procedures are met. Confined space permitting and entry procedures are included as an attachment to this plan.

Noise - Personnel exposed to noise levels over 85 dBA will be required to wear approved hearing protection provided by KEMRON. Work around heavy equipment always entails the possibility of exposure to excessive noise, and as such, hearing protection will be utilized by personnel when working in the proximity to such equipment. Excessive noise can be readily identified by workers on site by difficulty in hearing verbal communication at approximately an arm's length away. Employees on site will be briefed on noise hazards and protection as part of the site-specific training, and this information will be included in the regular tailgate sessions and documented

Electrical - Only qualified personnel meeting KEMRON and OSHA compliant electrical safety training standards are authorized to work on electrical circuits. KEMRON Lock Out-Tag Out (hazardous energy control) procedures shall be used before any maintenance on electrical circuits or equipment is performed. Extension cords will be inspected daily. Damaged

extension cords will be taken out of service and marked for repair or discarded. Ground fault circuit interrupters will be used on all temporary electrical cords and circuits (i.e., generators, site trailers, etc.). Electrical cords not specifically made for water submersion will be kept out of wet areas.

Bulk Fuel Storage Areas - Bulk Storage containers used for flammable liquids must be properly grounded and have bonding cables attached. Flammable-No Smoking signs will be placed around the area so they are clearly visible. Areas that are designated for bulk fuel storage area must be capable of containing and retaining 110% of the largest tank stored inside that area. A dedicated 20-B rated fire extinguisher (20-lb. ABC or equivalent) must be located between 25 and 75 feet from the storage area as per 29 CFR 1926.152.

Small Quantity Flammable/Combustible Materials - Small quantities of flammable/ combustible materials shall be stored in OSHA approved "safety cans" with appropriate flame arrestors, self-closing lids, and labeled according to their contents per 29 CFR 1910.106(a)(29). Other miscellaneous flammable materials/combustible materials such as aerosol cans, paints, cleaning solvents, etc.; shall be stored in a National Fire Protection Association, OSHA and Uniform Fire Code approved "flammable storage cabinet" per 29 CFR 1910. 106(d)(3)(ii)(a).

5.3 Environmental Hazards

Heat/Cold Stress - Personnel have the potential to be exposed to both climatic extremes of heat and cold. Because of these conditions, operating procedures were developed so that the hazards associated with these temperature extremes on the body can be recognized and avoided. The type of protective clothing (permeable and non-permeable) used on the project is also taken into account when dealing with heat/cold stress conditions. Heat/Cold stress standard operating procedures should be reviewed and followed. For Heat Stress, the following general precautions are taken:

- Training in the prevention and recognition of heat stress symptoms
- Encourage proper physical fitness and diet in employees
- Maintain fluid intake (prevent dehydration)
- Modify, as needed, the anticipated work rate
- Use of the buddy system
- Availability of shaded and cooled rest areas and personal cooling devices

For Cold Stress, the following precautions are taken:

- Training in the prevention and recognition of cold stress symptoms
- Encourage proper physical fitness and diet in employees

- Dressing in layers to protect exposed skin and provide insulation
- Use of cotton or other absorbent materials to absorb sweat and maintain body warmth when wearing protective ensembles
- Maintain fluid intake (prevent dehydration)
- Modify, as needed, the anticipated work rate
- Use of the buddy system
- Availability of heated rest areas

Severe Weather - During severe weather, outdoor operations will be stopped under these conditions:

1. Lightning is within 10 miles of the site. Lightning has been known to strike within a radius of 8 miles from cloud to ground. Depending on the severity of the storm the speed at which it can move into the immediate area can be swift therefore notification of work stoppage to all crews must be immediate. Crews shall discontinue operations, seek appropriate shelter/meet at a predetermined staging area and wait for further instructions.
2. Heavy Precipitation (Rain, Snow, Sleet, etc.) that affects visibility, mobility, or the overall conditions in which equipment and personnel can operate safely.
3. High winds with a sustained rate of 30 miles per hour or greater or, winds that produce blowing dust and debris, creating low/poor visibility conditions or, winds that create hazardous conditions in wooded areas that present a “dead fall” hazard.

In evaluating the time when it is safe for crews to resume work, the following method will be used. The SSHO/UXOSO will wait 30 minutes after the first lightning strike to evaluate the weather conditions. The 30-minute wait clock will be reset after each additional lightning strike. After the heavy weather has left the area, the SSHO/UXOSO will determine that operations can continue in a safe manner. The “all clear” signal will be given and personnel will return to work.

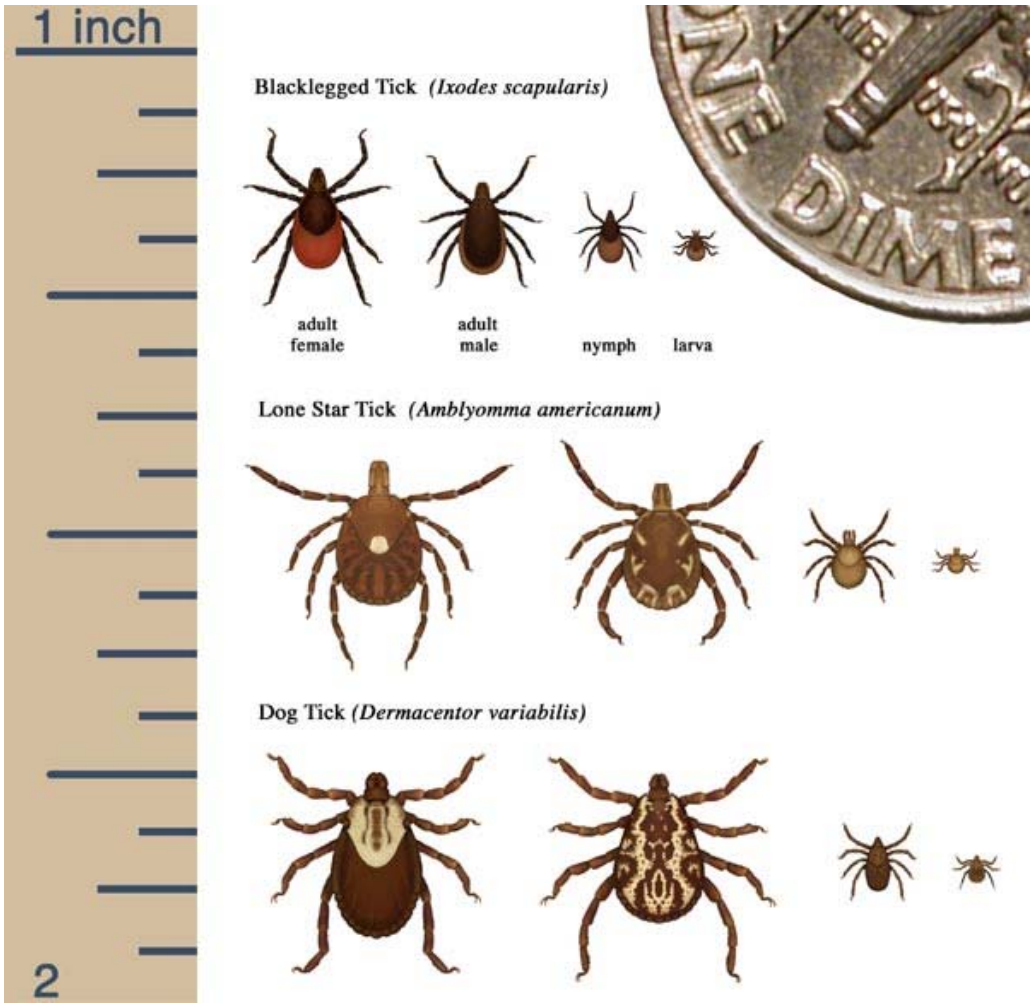
Animal/Insect/Vegetation - Rodents, snakes, stray animals, stinging (venomous) insects and poison ivy/sumac/oak are all environmental hazards that may be encountered during daily site operations. Site investigation to identify the hazards before work related activities begin are essential. Information regarding these hazards is provided in the following subsections.

5.3.1 Ticks

Ticks attach to their host's skin and feed on its blood, creating an opportunity for the transmission of disease. The first symptoms of tick-related disease are flu-like chills, fever, headache, dizziness, fatigue, stiff neck, and bone pain. If treated promptly by a physician, most individuals recover fully in a short period of time. If not treated, more serious symptoms can occur. Recently, Lyme disease has been the most prevalent type of disease transmitted by ticks in the United States. If an employee believes a tick has bitten him/her, or if any of the signs and symptoms appears, the SSHO/UXOSO will direct the employee to visit a physician for examination and possible treatment.

When working in areas that might be infested with ticks, personnel should limit the amount of unprotected skin. Light-colored clothing is preferred for higher visibility of ticks. If heavy concentrations of ticks or other insects are anticipated or encountered, Tyvek coveralls will be used for added protection. Personnel should examine their own and their co-workers' clothing frequently for the presence of ticks and should avoid contact with bushes, tall grass, or brush as much as possible when walking in wooded areas.

If a tick is discovered, it should be detached with a fine-tipped tweezers, not with the fingers. The tick should not be twisted as it is detached, and its bloated body should not be squeezed. All parts of the tick should be removed, and the bite area should be washed thoroughly with soap and water and disinfected with alcohol or a similar antiseptic after the removal. The tick should be saved in a small container labeled with the date, the body location of the bite, and the likely source of the tick.



5.3.2 Stinging Insects

Stinging insects present a serious threat to personnel, and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects. Nests and hives for bees, wasps, hornets, and yellow jackets often occur in the ground, in trees and brush and under the eaves of buildings. Work areas will be checked for obvious nests and hives before work is started.

Insect stings are responsible for more deaths in the United States than the bites and stings of all venomous creatures. This is due to hypersensitivity and/or sensitization to toxins from repeated stings, which can result in anaphylactic reactions. Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth, and/or respiratory passages. Individuals who are hypersensitive to such stings and have life-threatening allergies should carry a kit containing antihistamine and epinephrine, and will not work in areas where there is a significant potential for insect stings.

Bites and stings can be painful and may elicit an allergic reaction. To reduce the pain, ice should be placed over the sting and an analgesic corticosteroid lotion applied. If the stinger is embedded in the skin, it should be removed by teasing or scraping rather than pulling. If simple first-aid measures do not alleviate the symptoms, the victim should be taken to the nearest medical center. The offending insect should be killed and taken to the emergency room with the victim if this can be done quickly and without endangering other personnel.

5.3.3 Spiders

The biting insects of greatest concern are spiders, especially the black widow and the brown recluse. These spiders are of special concern due to the significant adverse health effects that can be caused by their bites.

The black widow is a coal-black, bulbous spider. The female, whose bite is toxic, has a body length of approximately 1/2 inch and an overall length of about 1-1/2 inches, with a bright red hourglass marking on the underside of the abdomen. The black widow is usually found in dark, moist locations, especially under rocks and rotting logs, and may be found in outdoor toilets.

The brown recluse is brownish to tan in color, rather flat, 1/2 to 5/8 inches long, with a dark brown "violin" shape on the underside. It is most often found in trees or in dark locations.

There is no effective first aid treatment for either of these bites. Except for very young, very old, or weak victims, these spider bites are not considered to be life-threatening; however, medical treatment must be sought to reduce the extent of tissue damage caused by the injected toxins.

Brown Recluse

Black Widow

5.3.4 Snakes

Snakes may be present in the work area. Workers will be advised to avoid reaching into areas where they cannot see and under items resting on the ground, and to avoid walking through brushy areas. If a snake suspected of being poisonous is observed, the SSHO/UXOSO should be advised, and a warning given to site personnel to avoid walking in the area. If a person is bitten, an identification of the snake should be made if possible, and the person transported immediately to the medical center.

Workers should also be aware that if there is evidence of the presence of rodents, the hazards associated with exposure to Hantavirus may be present. Site personnel must be warned to avoid direct contact with dead rodents or dried fecal material, and to avoid exposure to airborne dust where dried rodent fecal matter may be present.

Common Snakes of California

California King Snake

Western Yellow-bellied Racer

California Striped Racer

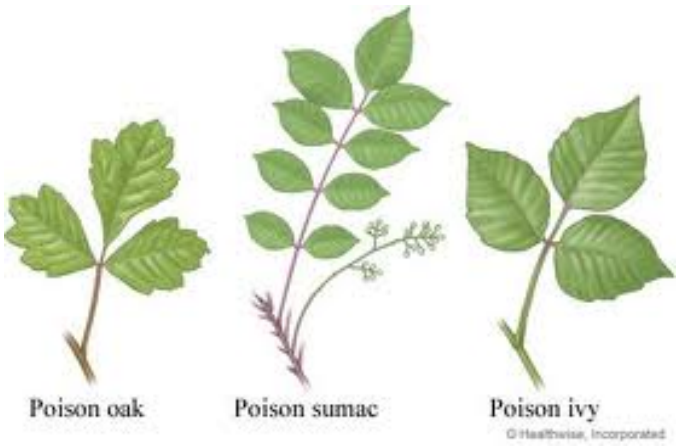
Ring-necked Snakes

Western Rattle-Snake

Gopher snake

5.3.5 Poison Oak or Ivy

Poisonous plants (primarily poison oak) may be present in the work areas. These plants contain a resin that causes a delayed allergic hypersensitivity reaction following contact. The resin is active in live, dead, dry, and burned plant parts, and may be carried through the air. Signs and symptoms are usually evident within 24 to 48 hours after exposure. These include burning, stinging, and blisters. Site personnel should notify the SSHO/UXOSO if these plants are observed. If exposure or contact occurs, the affected area should be washed, and care should be taken so that the resin does not spread to un-contacted areas. Protective clothing may be required.



5.4 Explosive Ordnance

This section discusses the military munitions hazards that may be encountered during remedial activities at the former Fort Ord. If an item is suspected to be military munitions, all work will cease and the UXOSO/ SSHO will be notified, who in turn will notify the SUXOS. At this point, the SUXOS will take over and implement the requirements presented in the RD/RA Work Plan (USACE, 2009) and the MPS (ITSI, 2011), and work in accordance with MEC Standard Operating Procedures. MEC includes the following:

- **Discarded Military Munitions (DMM)**. DMM are defined as ammunition, ammunition components, chemical or biological warfare materiel, or explosives that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried or fired.
- **Explosive Soil**. Explosive soil refers to a mixture of explosives in soil, sand clay or other solid media at concentrations such that the mixture itself is explosive.
- **Unexploded Ordnance (UXO)**. UXO is defined as military munitions that have been primed, fused, armed, or otherwise prepared for action and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard and remain unexploded either by malfunction, design, or any other cause.

The Impact Area MRA includes a large number of ranges that have various historical uses, designs, and characteristics (MACTEC, 2007). Over the years, various types of munitions have been used during training activities within the Impact Area MRA, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms. Select ranges were used for small arms training activities only, while other ranges are characterized as multi-use. The firing ranges were located along the perimeter of the Historical Impact Area such that weapons' firing was generally directed toward the center of the Historical Impact Area. The hazards presented by the presence of MEC in the Impact Area MRA are being mitigated by the procedures presented in the RD/RA Work Plan and include fencing, MEC awareness training, MEC escort in areas not previously surface cleared, and properly trained and certified UXO staff conducting the remedial activities.

5.4.1 Explosives Handling

All MPPEH requiring detonation will be marked with pin flags pending if blow-in-place disposal is conducted. Consolidation of MPPEH will be conducted if transport is considered appropriate and safe by the SUXOS and UXOSO. All explosive operations will be supervised by the SUXOS and coordinated with the on-site USACE OE Safety Specialist. Personnel will avoid inhalation and skin contact with smoke, fumes, and vapors of explosives and related hazardous materials.

Personnel handling exposed explosives will wear protective gloves to protect against chemical absorption. All explosive operations will follow the procedures outlined in Technical Manual TM 60A 1-1-31, *Explosives Ordnance Disposal Procedures* and Engineering Manual) 385-1-97, *Explosives - Safety and Health Requirements Manual*. Demolition operations will be performed daily, as needed.

5.4.2 Explosive Storage, Accountability, and Transportation

Perforators will be stored in the on-site magazine. Additional and specific explosives will be ordered on an as need basis from an explosives vendor. Total control of explosives will be maintained while the explosives are on-site. All vehicles transporting explosives will be properly inspected, equipped, and placarded prior to the loading of explosives onto the vehicle, and DD Form 626 "Motor Vehicle Inspection" completed.

5.4.3 Engineering Controls

If the UXOSO, SUXOS, and USACE OE Safety Specialist believe that the EZ will be difficult to maintain due to terrain, vegetation, etc., engineering controls for demolition will be used as specified in *Use of Sand Bags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions*, HNC-ED-CS-S-98-7 or in *Use of Water for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions*, HNC-ED-CS-S-00-3. These controls will be applied as necessary to mitigate fragmentation and blast hazards

created during demolition operations. A copy of HNC-ED-CS-S-98-7 and HNC-ED-CS-S-00-3 will be available on site if these engineering controls are to be used.

5.4.4 Disposal Shots

Prior to preparing MEC/MPPEH for detonation, all nonessential personnel will be evacuated from the EZ and remain outside the EZ until all MEC operations are completed. The UXOSO will ensure clearance of nonessential personnel from the EZ through visual surveillance and radio contact with personnel patrolling the EZ perimeter. While preparing MEC/MPPEH for detonation, the UXOSO will ensure that the number of personnel on site is kept to the minimum required to safely accomplish the disposal mission. Authority to initiate demolition operations will rest solely with the SUXOS. The UXOSO will be responsible for ensuring all personnel have been accounted for and that the area is secure prior to authorizing the detonation of explosive charges. The SUXOS will ensure that all required parties are notified of an impending demolition shot.

5.5 Ionizing Radiation

Radiological hazards may include radium painted dials in equipment used as munitions targets and other small miscellaneous munitions related components. A Radiation Protection Project Plan will be developed to control the hazards associated with the cleanup of these dials.

X-ray equipment may be used to X-ray munitions. The product user's guide will be referenced to address the operation and potential hazards associated with the use of this equipment. All X-ray equipment used on site will be registered per State of California requirements.

5.6 Safety Inspection

The UXOSO/SSHO or TMs will make daily inspections of the work site and employee work practices to ensure compliance with this SSHP, note changed conditions, and identify new hazards. These inspections will be recorded in the daily log, and all necessary corrective actions will be implemented in a timely manner. Additionally, periodic in-depth inspections will be performed. These inspections should include, but are not limited to: housekeeping, implementation of tailgate meetings, employee training, employee exposure monitoring, project recordkeeping, accident investigation and recordkeeping, equipment maintenance and inspection, compliance with standard work procedures, response to employee safety concerns, and specific hazard communications.

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SECTION 6 AIR MONITORING

Air monitoring is not expected to be necessary during the field activities. If conditions in the field indicate the need for exposure monitoring, the SUXOS will coordinate with the CSHM to develop and implement appropriate air or personnel exposure monitoring. The purpose for air monitoring on this project is to insure that proper levels of respiratory protection are being maintained and to determine the size and location of the exclusion, contamination reduction, and support zones.

6.1 Area Air Monitoring

This Air Monitoring Plan (AMP) outlines monitoring strategies which can be used to assess personnel exposure to chemical hazards during environmental services at the project site. Monitoring will consist primarily of evaluating personnel exposures to volatile organic compounds and oxygen percentages while workers perform activities.

6.2 Personnel Air Monitoring

Air monitoring will be conducted during tasks as needed and under the direction of the CIH/CSHM or SUXOS.

6.3 Health and Safety Action Levels

An action level is a level at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and vapor mitigation actions, etc.) must be implemented prior to commencing activities at the specific work area. Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of the SUXOS or CSHM.

Reasons to upgrade:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas, vapor, or dust emission.
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

Reasons to downgrade:

- New information indicating that the situation is less hazardous than was originally suspected.
- Change in site conditions that decrease the potential hazard.
- Change in work task that will reduce exposure to hazardous materials.

6.4 Exposure Control Methods

Employee exposures to the site contaminants may be minimized through engineering and administrative controls, and through the use of PPE. Engineering and administrative controls will be used wherever possible, even if PPE will also be utilized. Exposure control methods will be implemented before any work with contaminated materials is performed on site, and protective measures will be utilized at all times during soil disturbance or other activities on the work site with the potential to create exposure. These controls include proactive use of water spray, careful handling of soils and other materials; establishment of work zones; establishment of appropriate housekeeping and decontamination procedures; assignment of the appropriate personal protective equipment; and provision of hygiene facilities for personnel hand and face washing.

SECTION 7 SITE CONTROL

To prevent migration of contamination from personnel and equipment outside the work zones, work areas will be clearly specified and designated as below prior to beginning operations. Each work area will be clearly identified using signs or physical barriers. Access to contaminated areas will be controlled through administrative procedures and physical barriers. As work progresses, site controls will be evaluated and revised as needed. Initial zones will be determined using a combination of monitoring data, sampling data, and photographic information provided by USACE. Work zones will be sketched onto a site drawing and posted at the site where they are readily visible to all personnel. Additionally, work zones and demarcation (boundary) lines will be reviewed daily at the safety tailgate meeting.

- Exclusion Zone
- Contamination Reduction Zone
- Support Zone

A log book of all personnel visiting, entering or working on the site shall be maintained by the SSHO/UXOSO. No visitor will be allowed in the EZ without showing proof of training and medical certification, per 29 CFR 1910.120(e), (f). Visitors will attend a site specific safety brief/orientation given by the SSHO/UXOSO and sign a Visitors Safety Brief/Orientation acknowledgment. These preliminary zones will be utilized unless site conditions require that modifications are necessary.

7.1 Support Zone

The support zone (SZ) will be located in an area that has been determined contamination free or “clean” by supporting analytical data or other objective criteria. In this zone site break areas, toilet facilities, administrative, and other support functions will take place. Contaminated PPE and/ or equipment are prohibited in this area.

7.2 Contamination Reduction Zone

The contamination reduction zone (CRZ) is the area between the exclusion zone and support zone designated for equipment and personnel decontamination. The CRZ may also be a staging area for site tools, emergency equipment, containment equipment, additional PPE, sampling equipment, and air bottle changes. All personnel and/ or equipment exiting the exclusion zone must enter the CRZ for decontamination before entering the support zone. PPE dress outs must be accomplished in the support zone before entry into the CRZ. Contaminated PPE will remain in the CRZ or the exclusion zone until properly disposed of. The location of the

CRZ will be determined primarily by the distance needed to prevent a potential release, explosion, or other hazard in the exclusion zone from affecting personnel in the CRZ and SZ.

7.3 Exclusion Zone

The exclusion zone is the restricted area where it has been determined by supporting analytical data that UXO/contamination exists and poses a potential health hazard. Only authorized personnel necessary for the performance of the required work, and who meet all the requirements as stated in Section 1.0 "Introduction and Site Entry Requirements" of this SSHP and other applicable requirements of 29 CFR 1910.120 and the KEMRON Corporate Health and Safety Manual are allowed entrance. The exclusion zone will be well delineated by means of barricades, caution tape, fencing, or other highly visible and physical barriers. Highly visible signs shall be placed at the perimeter of the exclusion zone that state the hazard (i.e., WARNING CONTAMINATED AREA - KEEP OUT or HAZARDOUS WORK AREA - AUTHORIZED PERSONNEL ONLY).

7.4 Buddy System

The Buddy System shall be used for all entries into the exclusion zone. This is a system of organizing employees into work teams in such a manner that each team member can observe the activities of each other. Thus, in case of an emergency, the entire team can account for the location and activity of each team member.

7.5 Visitors

All visitors will report to the KEMRON command post immediately upon arrival. All visitors entering the EZ must provide (if possible) all required training and medical monitoring documentation before arrival on-site. The Project Manager must approve the site visit and shall coordinate visitor activities with the SSHO/UXOSO. The SSHO/UXOSO shall establish a safe travel route through the site and away from active operations. All visitors will be escorted while on site.

1. All visitors shall wear:
2. Safety-Toed Shoes or Boots
3. Hard Hat, as appropriately necessary
4. Safety Glasses
5. Tyvek (general use uncoated Tyvek or comparable), as necessary
6. Reflective Safety Vest

7.6 Site Security

Site security duties will include:

1. Protecting unauthorized personnel from site hazards (physical or chemical exposure)
2. Preventing unauthorized personnel from entering exclusion zone
3. Preventing vandalism or theft of company equipment
4. Notifying emergency response agencies in case of a fire, explosion, or release after work hours.
5. Maintaining site surveillance
6. Ensuring all visitors are approved and have valid purpose for entering the site.
7. Ensuring that all visitors are escorted

7.7 Site Maps

Site maps depicting the work areas, contaminated areas, EZ, CRZ, SZ and command post will be developed and posted on site prior to work, as applicable. The map will include designated work areas, escape routes, emergency assembly areas, hazardous and utility layouts. Additionally, a map depicting the hospital driving route (included in Section 10.5) will also be posted at the site and reviewed with personnel during the site orientation.

7.8 Site Communication

A communication system will be established on site with two communication nets (networks).

One net will be an internal communication net for on-site personnel and the other will be an external communication net for use between on-site and off-site personnel.

The internal communication net is used to alert all on-site personnel to potential emergencies. Safety information (such as the current time, the amount of time already spent in the exclusion zone, heat stress check, etc.) is also sent out on this net. Common internal communication devices can range from radios to hand/visual signals. To be effective, all communication commands must be prearranged and all signals recognized by all on-site personnel in advance.

The external communication net is used to coordinate outside emergency response, report to management, and maintain contact with essential off-site personnel. This net is essential to provide personnel access to medical and emergency services. Telephones, either landline or cellular, are used to establish this external net.

7.9 Site Inspections

The SSHO/UXOSO will conduct formal site inspections on a monthly basis and informal inspections on a daily basis. The Project Manager or the Program Manager can also conduct site inspections. All formal inspections will be documented and kept in the project file for review by Corporate Health and Safety. Any deficiencies noted will be documented and corrective or disciplinary actions will be formally noted by the SSHO/UXOSO in conjunction with the corporate CIH and/or corporate Health and Safety Manager.

7.10 Traffic Control

The PM or TM and SSHO/UXOSO shall ensure that traffic patterns and roadways are designed and operated in a manner that minimizes the potential for vehicle related accidents. If any local traffic is negatively impacted by project tasks then traffic control implementation must be coordinated with Fort Ord personnel. Key elements that will be considered and reviewed include:

- *Minimize the potential for operating vehicles in reverse (i.e., backing)*
- *Avoid traffic patterns with head-on traffic patterns. Where practical, establish traffic patterns that are circular.*
- *Minimize intersections when creating traffic plans.*
- *Avoid areas with overhead obstructions. Where overhead obstructions cannot be avoided, post warning signs and/ or construct warning devices. Warning devices are recommended where traffic includes the use of dump trucks.*
- *Maintain safe vehicle speeds. Slower traffic speeds should be required at intersections, in curves and in areas where pedestrian traffic is common.*
- *Instruct all drivers on proper procedures and speed limits.*

To ensure adequate traffic control, all vehicles entering the site shall be required to check in with KEMRON command post. Only authorized vehicles will be allowed beyond the support zone area. Posted speed limits will be enforced by the KEMRON site management team. All vehicles that enter a potentially contaminated area shall be decontaminated before leaving the site.

SECTION 8 DECONTAMINATION

The decontamination process is designed to remove any contamination acquired in the exclusion zone and to prevent contaminated materials from entering the support zone (clean area). Care must be exercised to ensure that contaminants are removed from personnel and equipment before leaving the site. Decontamination zones will be located immediately adjacent to each EZ for the Site 39 work. All site personnel working in the EZs must pass through the Decontamination Zone before proceeding to the Support Zone. Personal protective equipment cleaning and storage areas will be included in the Decontamination Zone. Equipment and vehicle decontamination areas will be located immediately adjacent to the work areas, in a manner that prevents tracking of contamination from the source location to other areas. Temporary equipment decontamination wash pads will be constructed as necessary; all wash water will be collected for appropriate testing and subsequent disposal.

8.1 Personnel Decontamination

Dry decontamination is the preferred method for this project and involves the removal of contaminated layers of personal protective clothing. Boots will be decontaminated by using a wet method “boot wash” station located at the CRZ. The boot wash will be comprised of plastic sheeting on the ground surface and two large wash tubs. The first tub will be filled with water and soap solution and a brush to remove gross contamination. The second tub will be a rinse, made of clean water. Once completed, personnel will exit the zone free of contamination. All liquids will be captured for proper disposal.

An emergency eyewash (16 ounce) will be located at the CRZ, next to the personnel decon station, in the event that an emergency decontamination is needed. Once all the gross contamination has been removed the affected personnel shall fully decontaminate and exit through the CRZ to the shower trailer or other type of decontamination facility. All site employees will wash hands and face before leaving the decontamination area. Site personnel shall assist with the emergency decontamination only if they are also protected from exposure. The Project Manager or SSHO/UXOSO will be notified immediately of any emergency.

8.2 Emergency Personnel Decontamination

In the event of an emergency medical situation, personnel effected will be decontaminated to the maximum extent possible before providing first aid or exiting the exclusion zone. The primary concern for personnel will be to prevent the loss of life or severe injury to personnel. The SSHO/UXOSO will be responsible for determining the severity of the emergency or medical situation and will dictate the level of decontamination. Every measure will be taken to decontaminate all personnel exiting the exclusion zone. Therefore, if the emergency situation

requires immediate removal of the person from the exclusion zone, then the following emergency decontamination steps will be followed.

- Removing all clothing potentially exposed to onsite COCs;
- Wrapping or covering the person in plastic or blankets; and
- Conducting spot decontamination of visible gross contamination.

In emergency situations where personnel must be transported to a hospital or medical facility, and full decontamination was not conducted, then the interior of the vehicle transporting the employee will be covered in plastic to reduce the spread of onsite COCs offsite.

8.3 Equipment Decontamination

The primary method to be used to prevent equipment or truck contamination is to prevent or minimize travel through contaminated materials. Any equipment that comes in contact with contaminated materials will be properly cleaned before being removed from the site. Equipment decontamination will be in proportion to the degree of contamination encountered.

Equipment decontamination is expected to require only gross removal of soils from buckets or wheels. Shoveling, wet- or damp-brushing or wiping will be the primary decontamination methods used for equipment. Wastes removed from equipment will be returned to the appropriate waste stockpile or placed with the load of waste for transport. Equipment coming in contact with contaminated soil will be decontaminated utilizing the following procedure:

- Dry decon to physically remove sediment/soil with scrapers and brushes
- Rinse with pressure washer/steam cleaner and
- 5% Alconox and 95% clean water and final rinse with clean water (if necessary).

If necessary, when heavier contamination is present, equipment and vehicles will be washed with a pressure washer. Any pressure washing will be performed over a lined area. Decontamination will proceed until all soil and residues are removed. Waste liquids will be contained and disposed of properly.

Small equipment will be washed in the same manner as contaminated personal protective equipment (i.e., with a brush and soapy water and rinse water). Employees exiting the work area will wash any boots and/or gloves to be reused in the buckets provided for washing and rinsing, and will remove contaminated clothing items carefully and place them in the appropriate containers.

Equipment and vehicle decontamination can also be achieved with wet decontamination methods. This form of decontamination usually involves the use of high-pressure washers. Due to the water generated by this procedure, a wastewater containment area must be

constructed. All wastewater generated would be collected for disposal. Specific decontamination solutions will be available to help decontaminate equipment. This form of decontamination utilizing the following procedure:

- Initial rinse with clean water.
- Scrub equipment with a solution containing 5% Alconox and 95% clean water using plastic-bristled brush.
- Final rinse with clean water.

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SECTION 9 SANITARY FACILITIES AND LIGHTING REQUIREMENTS

Sanitary facilities, permanent or temporary will be provided on all KEMRON job sites. The requirements for sanitary facilities on site will meet all applicable standards found in CFR 29 1910.120 (n)(3) and the KEMRON site operating procedure.

TOILET FACILITIES

Number of employee's	Minimum number of facilities
20 or fewer	One
More than 20, fewer than 200 employee's	One toilet seat and one urinal per 40
More than 200 employee's	One toilet seat and one urinal per 50

For this project, one sanitary facility shall be provided for every 10 employees.

Adequate lavatory facilities will be provided for employees to wash their hands at each break, before eating, drinking or smoking, and at the end of the work day. For sites where lead is a COC, lavatory facilities at a minimum must include tepid running water, soap and disposable hand drying towels. All work sites must be equipped with water, soap and towels for hand washing.

Lighting on job sites will meet all applicable standards found in 29 CFR 1910.120 (m). Minimum illumination on job sites will be at 5-foot candles for work areas and 3-foot candles for excavations.

MINIMUM ILLUMINATION INTENSITIES IN FOOT-CANDLES

Foot-candles	Area or operations
5	General site areas
3	Excavation and waste areas, access-ways, active storage areas, loading platforms, refueling, and field maintenance areas
5	Indoors. Warehouses, corridors, hallways, and exit ways
5	Tunnels, shafts, and general underground work areas. (Exception: Minimum of 10 foot-candles is required at tunnel and shaft heading during drilling mucking, and scaling. Mine Safety and Health Administration approved cap lights shall be acceptable for use in the tunnel heading.)

10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

Section 10 CONTINGENCY PLAN

10.1 Contingency Plan Activation

The KEMRON contingency plan may be activated by any of the following conditions:

1. An injury occurs in any of the work zones.
2. A chemical hazard action level exposure is reached or an air monitor alarm sounds
3. Someone observes the development of an IDLH situation.
4. An unknown odor is detected.
5. There is a security breach and/ or presence of unauthorized personnel.
6. There is a weather-related emergency.
7. There is a major release, explosion, or fire.
8. There is a facility alarm condition.

In case of a project emergency, the following equipment will be used to alert on-site personnel.

1. Portable radio communications or,
2. Portable air horns. If this is used, the following alarm signals will be used:

   1 Blast - Attention, Contact command post
   2 Blasts- Emergency, Assemble at decontamination line.
   3 Blasts- General Emergency, Evacuate site immediately and meet at designated assembly area.
3. Facility alarm system

The designated assembly areas and emergency evacuation routes will be established and posted. All personnel on site will be briefed on all emergency procedures as part of the initial safety briefing.

10.2 Emergency Procedures

CRZ or EZ Injury: Operations will cease, the POM Fire Department emergency will be called and the area will be cleared for emergency personnel. If the SSHO/UXOSO determines it is safe to do so, work party team members will retrieve injured personnel and will decontaminate to the extent possible before movement to support zone. Emergency contacts listed in Section 10.4 will be called immediately for support and to administer aid/care to injured workers. If the condition is serious, at minimum a partial decontamination may be completed. First aid will be administered until professional medical assistance arrives. If movement will aggravate the injury, the injured personnel will be left in place. If the injured personnel are at a greater risk inside the exclusion zone or emergency personnel are not able to enter the zone, then

movement of the injured personnel becomes unavoidable. Care will be exercised to prevent spread of contamination. A copy of the suspected contaminants is to be provided to the responding medical team for transport back to the hospital. Figure 2 illustrates the emergency meeting location.

NOTE: Rescue of downed personnel where the reason of that occurrence is not known will be performed in the next higher level of PPE.

Support Zone Injury: Project Manager, or his designee, will assess the nature of the injury. If injury does not affect performance of personnel, operations may continue. If injury increases risk to others, operations will cease, until risk is removed or minimized.

PPE Failure: The event of PPE failure or alteration, that person and his/her buddy will immediately leave the exclusion zone and assemble at the decontamination line. Re-Entry will not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: In the event of equipment failure other than PPE, the SSHO/UXOSO and SUXOS shall determine if the problem affects the safety of personnel or prevents the safe completion of the tasks. In which case the operation shall cease until repairs/replacements are made and the risk to safety is removed.

Fire or Explosion: Operations will cease, the POM Fire Department emergency number will be called, and personnel will assemble at designated rally points on the alarm given. No fires will be fought where there is the potential of imminent contact with UXO or explosives. In the event of fire, all personnel will immediately evacuate the area, assemble at a designated rally point and notify the fire department. KEMRON personnel may assist firefighters if required as well as all emergency responders with information related to the incident. All fires, regardless of size, must be immediately reported.

Spill, Leak or Release: Operations will cease and all personnel will assemble at the upwind marshalling area. If the upwind marshalling area is not accessible, personnel in the area will meet at the decontamination line or the designated assembly area depending on the alarm given. The Project Manager, or his designee, will attempt to determine the nature and extent of the release by air monitoring readings taken by KEMRON personnel. The Project Manager, or his designee, will contact regulatory agencies and response teams, if needed. If the spill, leak, or release is of known source and content, contained, minor in nature, and does not produce any off-site impact, the work team may mitigate it using materials and methods on site consistent with the work scope for the project. The Project Manager, or his designee, will direct the crew in making the necessary attempts to stop the release and initiate cleanup operations. Operations will remain suspended until the incident is controlled and contained. Spills, Leaks or Releases will require notification to the POM Fire Department.

10.3 Emergency Equipment

The following equipment will be located on the job site:

- First Aid Kit (Office Trailer, each vehicle)
- Emergency Eyewash, 16 ounce minimum (CRZ, each vehicle)
- ABC Dry Chemical Fire Extinguishers, located at:
  - Company Owned Vehicles
  - Decontamination Areas
  - Fuel Storage Areas
  - Each Piece of Equipment on Site

[X] Chemical Sorbents Pads
[X] Portable Air Horns
[X] Portable Communication Radios
[o] US Coast Guard Approved Personal Floatation Device

10.4 Emergency Telephone Numbers

National Support Services		Phone Number
CHEMTREC	Operator	800-424-9300
National Response Center	Operator	800-424-8802
National Poison Control Center	Operator	800-362-9922
Federal Emergency Management Agency	Operator	202-646-2400
Centers for Disease Control	Operator	800-232-4636
Local Emergency Service		**Phone Number**
Santa Clara Valley Medical Center Trauma/ Burn Facilities	Operator	(408) 855-5000 then press 0 for 24-hr operator (408) 885-6900 for Emergency Room
Community Hospital of the Monterey Peninsula	Emergency Department	(831) 625-4900
Doctors on Duty – Occupational Medical Facility (Marina Location)	Operator	(831) 883-3330
Cal-Star Air MedEvac (Emergency MedEvac)	Dispatch	(800) 252-5050
Presidio of Monterey Fire Department	Emergency Line	(831) 242-7700
Presidio of Monterey Police Department	Dispatch	(831) 242-7851

Other Agencies	Contact	Phone Number
US Army Garrison Presidio of Monterey Safety Office	Al Morrissey, Safety and Occupational Health Manager	(831) 242-6507
Fort Ord Base Realignment and Closure (BRAC) Office Base Environmental Coordinator	Bill Collins	(831) 242-7920
Fort Ord BRAC Office MMRP PM	Lyle Shurtleff	(831) 242-7919
BLM, Former Fort Ord	Eric Morgan	(831) 394-8314
Fort Ord BRAC Office Community Relations	Melissa Broadston	(831) 393-1284
Monterey Airport Tower	24 Hour line	(831) 375-3419
Presidio of Monterey Fire Dept. Non-Emergency	Operator	(831) 242-7702
USACE OE Safety Specialist	Shawn Meek	(916) 213-9563
CESPK Fort Ord COR	James Specht	(916) 557-7906
CESPK Fort Ord Project Manager	David Eisen	(831) 393-9692
Vandenberg Air Force Explosives Ordnance Disposal	Command Post for approval to dispatch	(805) 606-9961
Title	**Contact**	**Phone Number**
Project Manager	Steve Crane	(916) 792-5327
Deputy Project Manager	Erin Caruso	(925) 595-2337
SSHO/UXOSO	Val Valdez	(831) 869-2030
SUXOS	Brad Olson	(831) 869-0789

Hospitals:

Santa Clara Valley Medical Center/Trauma Center
750 S Bascom Ave, San Jose, CA 95128
Main Phone: (408) 885-5000
Emergency: (408) 885-6900

Community Hospital of the Monterey Peninsula
23625 Pacific Grove-Carmel Hwy, Monterey, CA 93942
Phone: (831) 625-4900

Primary Occupational Medical Provider (Alternative Locations are in Section 10.6):
Doctors on Duty
3130 Del Monte Blvd. Marina, CA 93933
Phone: 831-883-3330

10.5 Directions to Hospitals

Directions, phone numbers and a map will also be posted on site within all KEMRON and subcontractor vehicles.

bing Maps

A **near 93908, CA**
(Directions to approximate location.)

B **751 S Bascom Ave, San Jose, CA**
Santa Clara Valley Medical Center (800) 949-3276

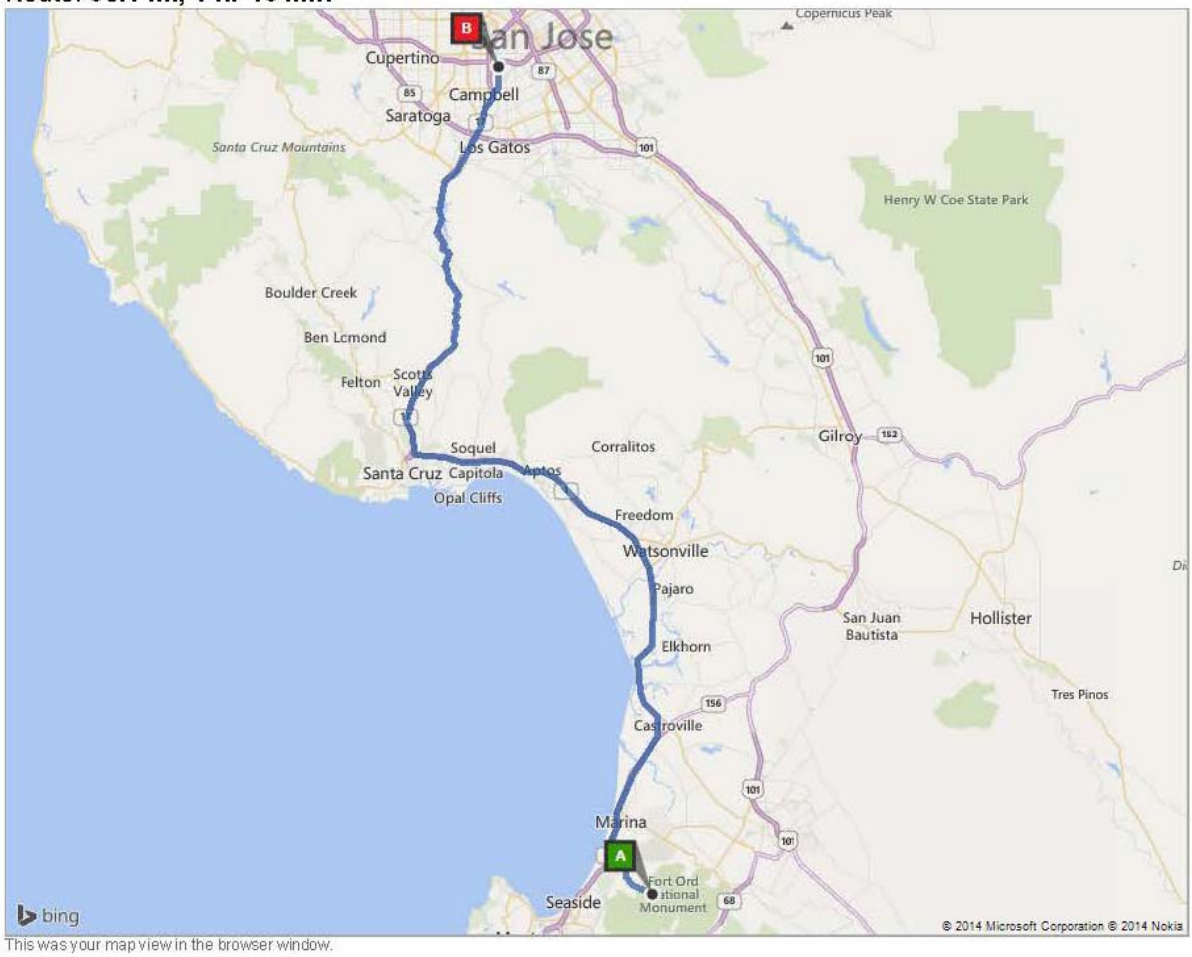
My Notes

On the go? Use **m.bing.com** to find maps, directions, businesses, and more

Route: **65.1 mi, 1 hr 16 min**

A	**near 93908, CA**	**A–B: 65.1 mi** 1 hr 16 min
	1. Depart **Eucalyptus Rd** toward Parker Flats Cut-Off *Private Road*	1.3 mi
	2. Turn **right** onto **Parker Flats Cut-Off**	1.2 mi
	3. Turn **left** onto **Gigling Rd**	0.3 mi
	4. Turn **right** onto **Malmedy Rd**	0.2 mi
	5. Road name changes to **Light Fighter Dr**	0.6 mi
1	6. Take ramp **right** for **CA-1 North** toward **San Francisco**	34.7 mi 32 min
17	7. At exit **441B**, take ramp **right** for **CA-17 North** toward **Oakland / San Jose**	25.0 mi 26 min
	8. At exit **25**, take ramp **right** toward **Hamilton Avenue**	0.2 mi
	9. Turn **left** onto **Creekside Way** *COURTYARD by Marriott on the corner*	259 ft
	10. Turn **right** onto **E Hamilton Ave**	0.2 mi
	11. Turn **left** onto **S Bascom Ave** *Chevron on the corner*	1.3 mi
B	12. Arrive at **751 S Bascom Ave, San Jose, CA** *If you reach Renova Dr, you've gone too far*	

Route: **65.1 mi, 1 hr 16 min**



This was your map view in the browser window.

bing Maps

A **near 93908, CA**
(Directions to approximate location.)
Via: Gen Jim Moore Blvd
B **23625 Holman Hwy, Monterey, CA**

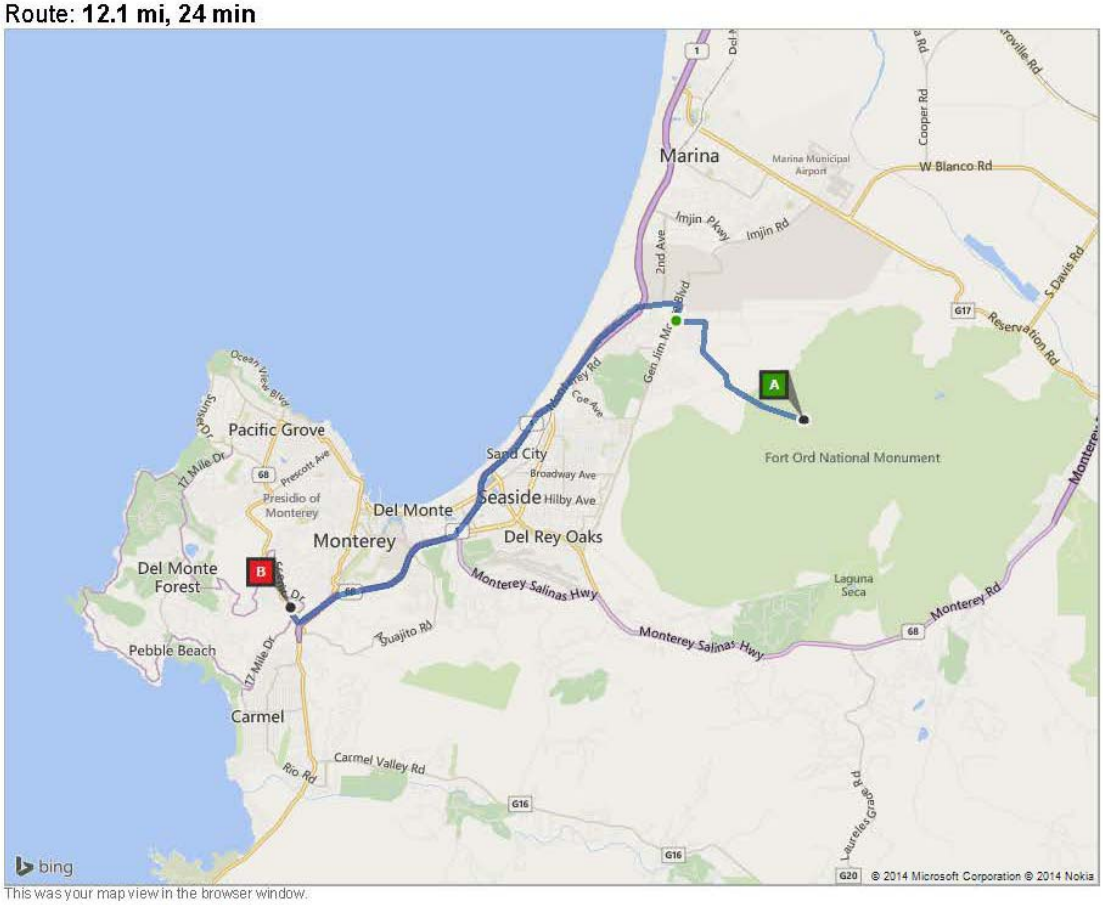
Route to the Community Hospital of the Monterey Peninsula

On the go? Use **m.bing.com** to find maps, directions, businesses, and more

Route: **12.1 mi, 24 min**

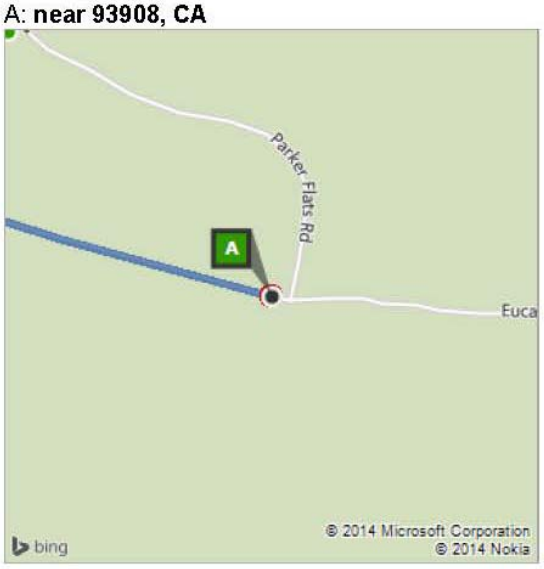
A	**near 93908, CA**	**A–B: 12.1 mi** 24 min
	1. Depart **Eucalyptus Rd** toward Parker Flats Cut-Off *Private Road*	1.3 mi
	2. Turn **right** onto **Parker Flats Cut-Off**	1.2 mi
	3. Turn **left** onto **Gigling Rd**	0.4 mi
	4. Turn **right** onto **Gen Jim Moore Blvd**	479 ft
	5. Make a U-turn to stay on **Gen Jim Moore Blvd**	269 ft
	6. Make a U-turn to stay on **Gen Jim Moore Blvd**	0.3 mi
	7. Turn **left** onto **Light Fighter Dr**	0.8 mi
1	8. Take ramp **right** and follow signs for **CA-1 South**	7.3 mi
	9. At exit **399A**, take ramp **right** for **CA-68 West** toward **Pacific Grove / Pebble Beach**	0.3 mi
	10. Turn **right** onto **CA-68**	0.3 mi
B	11. Arrive at **23625 Holman Hwy, Monterey, CA** *If you reach Skyline Forest Dr, you've gone too far*	

Route: **12.1 mi, 24 min**

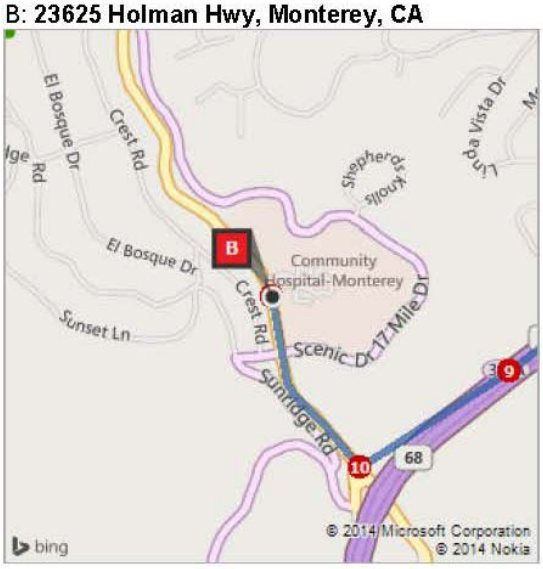


This was your map view in the browser window.

A: **near 93908, CA**



B: **23625 Holman Hwy, Monterey, CA**



10.6 Occupational Medical Facilities

APTOS

Doctors On Duty – Aptos
6800 Soquel Drive
Aptos, CA 95003
(831) 662-3611(ph)
(831) 662-0713 (f)

Days/Hours: Monday-Friday 8am-6pm;
Closed Saturday & Sunday

Clinic Manager: Montserrat Chatfield

Continue Reading

MARINA

Doctors On Duty – Marina
3130 Del Monte Blvd
Marina, CA 93933
(831) 883-3330 (ph)
(831) 883-3335 (f)

Days/Hours: Monday-Friday; 8am-6pm,
Closed Saturday & Sunday.

Clinic Manager: Denise Carson

Continue Reading

MONTEREY

Doctors On Duty – Monterey
501 Lighthouse Ave
Monterey, CA 93940
(831) 649-0770 (ph)
(831) 649-0142 (f)

Days/Hours: Monday-Friday 8am-8pm;
Saturday & Sunday 8am-6pm.

Clinic Manager: Erik Dormody

Continue Reading

SALINAS – SOUTH MAIN

Doctors On Duty - Salinas (South Main)
1212 South Main St
Salinas, CA 93901
(831) 422-7777 (ph)
(831) 422-0136 (f)

Days/Hours: Monday-Sunday 8am to 8pm

Clinic Manager: Denise Carson

Continue Reading

SALINAS URGENT CARE

Salinas Urgent Care
558 Abbott St, Ste A
Salinas, CA 93901
(831) 755-7880 (ph)
(831) 755-7886 (f)

Days/Hours: Monday-Friday 8am-6pm, Closed Saturday & Sunday

Clinic Manager: Lucina Villicana

Medical Director, Occupational Health: Steven C. Schumann, M.D.

Continue Reading

SAN JOSE

Doctors On Duty - San Jose
1910 N Capitol Ave
San Jose, CA 95132
(408) 942-0333 (ph)
(408) 942-0948 (f)

Days/Hours: Monday-Friday 8am-8pm; Saturday 8:30am-3pm; Closed Sunday.

Clinic Manager: Montserrat Chatfield

Continue Reading

SANTA CRUZ

Doctors On Duty - Santa Cruz
615 Ocean St
Santa Cruz, CA 95060
(831) 425-7991 (ph)
(831) 425-7346 (f)

SEASIDE

Doctors On Duty - Seaside
1513 Fremont Blvd, Ste E1
Seaside, CA 93955
(831) 899-1910 (ph)
(831) 393-9483 (f)

WATSONVILLE

Doctors On Duty - Watsonville
1505 Main St
Watsonville, CA 95076
(831) 722-1444 (ph)
(831) 722-4414 (f)

SECTION 11 SITE SAFETY PLAN REVIEW AND DOCUMENTATION

I have been briefed on and understand this site safety plan. I have been informed of the personnel to contact if I have any questions and know where to report any additional health and safety hazards. I agree to work according to the safety plan guidelines and understand that failure to do so could result in my removal from the site and/or termination of employment.

DATE	PRINTED NAME	SIGNATURE	ORGANIZATION

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SECTION 12 REFERENCES

Gilbane, 2014. Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California (AR # RI-047C)

Innovative Technical Solutions, Inc. (ITSI), 2011, Final Munitions and Explosives of Concern (MEC) Procedures Supplement, Former Fort Ord, California. (AR # OE-0737B)

MACTEC Engineering and Consulting, Inc. (MACTEC), 2007. Final Track 3 Impact Area Munitions Response Area Remedial Investigation/Feasibility Study, Former Fort Ord, California. (AR # OE-0596R)

MACTEC Engineering and Consulting, Inc./Shaw Environmental, Inc. (MACTEC/Shaw), 2012. Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 1, June 2009. [BW-2300J]; Revision 2 (AR # BW-2300L)

United States Army Corps of Engineers (USACE), 2009. Final Work Plan, Remedial Design/Remedial Action (RD/RA), Track 3 Impact Area Munitions Response Area, Former Fort Ord. (AR # OE-0660K)

U.S. Department of the Army (Army), 1997, Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California. (AR No. RI-025)

U.S. Department of the Army (Army), 2009. Final Record of Decision Amendment Site 39, Former Fort Ord, California. (AR # RI-041E)

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Figures

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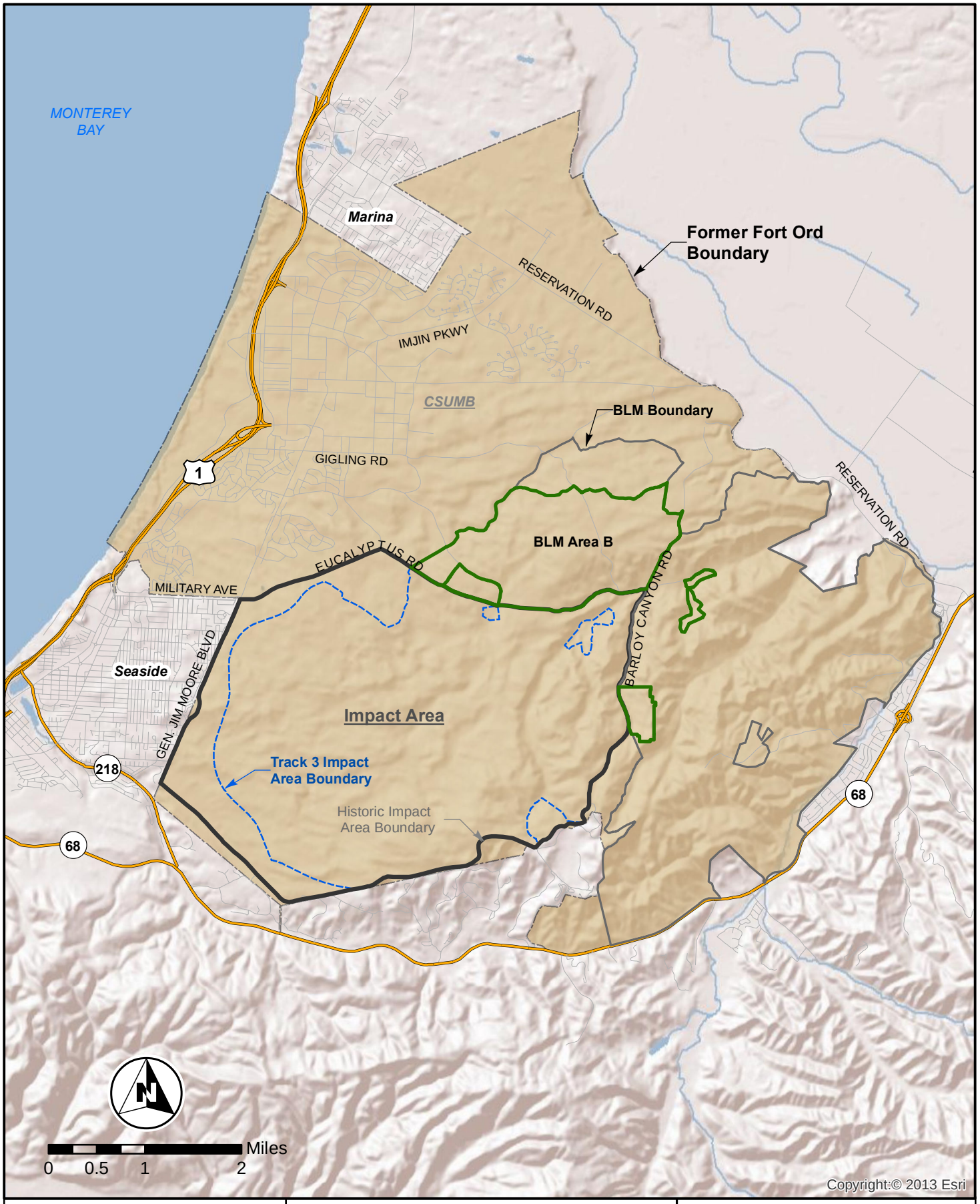

KEMRON ENVIRONMENTAL SERVICES

ACCIDENT PREVENTION PLAN
MEC REMOVAL AND SOIL INVESTIGATION
FORMER FORT ORD
MONTEREY COUNTY, CALIFORNIA

FIGURE 1

LOCATION MAP

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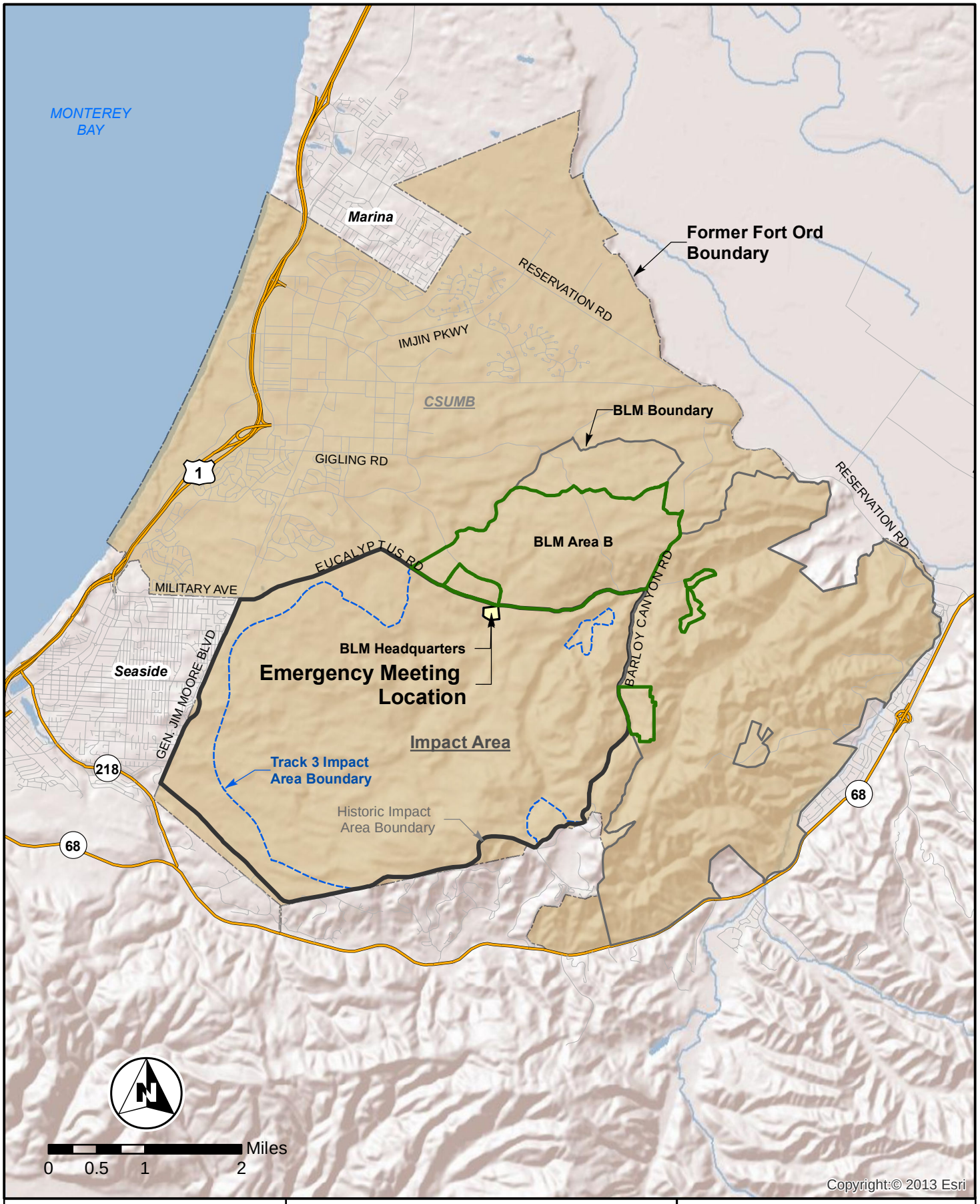

KEMRON ENVIRONMENTAL SERVICES

ACCIDENT PREVENTION PLAN
MEC REMOVAL AND SOIL INVESTIGATION
FORMER FORT ORD
MONTEREY COUNTY, CALIFORNIA

FIGURE 2
FORT ORD LOCATION MAP AND EMERGENCY MEETING LOCATION

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Attachment 1
Site Safety Forms

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KEMRON

Accident/Incident/Near Miss Report

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

GENERAL INFORMATION

SITE INFORMATION

Job Name: _____

Physical Address: _____

_____

_____

EMPLOYEE INFORMATION

Employee Name: _____

Home Address: _____

_____

_____

Last 4 digits of SS#: _____

Age and Gender: _____

Length of Employment: _____

Length of Time at Current Job: _____

INCIDENT INFORMATION

Location of Injury, Illness, and or Incident:

Date and Time of Incident: _____

Date Investigated: _____

Witnessed By: _____

Project Manager: _____

INCIDENT TYPE

- ☐ Unsafe Act
- ☐ Unsafe Condition
- ☐ Unsafe Equipment
- ☐ Unsafe Use of Equipment

SEVERITY	PROBABILITY
☐ Catastrophic	☐ Frequent
☐ Critical	☐ Likely
☐ Marginal	☐ Occassional
☐ Negligible	☐ Seldom
	☐ Unlikely

PROVIDED TRAINING, SAFETY RULES AND PROCEDURES

- ☐ Adequate Training
- ☐ Inadequate Training
- ☐ Lack of Training
- ☐ None Established
- ☐ None Recommended

Other (Explain):

CLASSIFICATION (circle all that apply)

INJURY/ILLNESS

- ☐ No Injury
- ☐ Abrasion
- ☐ Bruise
- ☐ Chemical Burn
- ☐ Cumulative Trauma
- ☐ Dislocation
- ☐ Foreign Body
- ☐ Fracture
- ☐ Inhalation
- ☐ Irritation
- ☐ Laceration
- ☐ Noise
- ☐ Physical Agent
- ☐ Puncture
- ☐ Sprain/Strain
- ☐ Thermal Burn
- ☐ Death
- ☐ Other (explain below)

INCIDENT

- ☐ Auto
- ☐ Client's Property
- ☐ Equipment (type)
- ☐ Fire/Explosion
- ☐ Leak/Spill
- ☐ Near Miss (explain)
- ☐ Subcontractor (explain)
- ☐ Other (explain)

PPE WORN DURING INCIDENT

- ☐ Dusk Mask
- ☐ Respirator
- ☐ Supplied-Air
- ☐ SCBA
- ☐ Cartridge Type:
- ☐ Safety Glasses
- ☐ Ear Plugs
- ☐ Face shield
- ☐ Hard Hat
- ☐ Ear Muffs
- ☐ Googles
- ☐ Welding Hood
- ☐ Other:
- ☐ Tyvek Suit
- ☐ Apron
- ☐ Saranex Suit
- ☐ Fire Retardant
- ☐ Nitrile Glove
- ☐ Work Glove
- ☐ Silver Sheild
- ☐ Butyl Glove
- ☐ Fall Protection
- ☐ Fall Arrest
- ☐ Other:
- ☐ Snake Chaps
- ☐ Knee Pads
- ☐ Chemical Boot
- ☐ Steel Shank
- ☐ Composite Toe
- ☐ Steel toe
- ☐ Metatarsal Steel Toe

PART OF BODY AFFECTED

- ☐ Face
- ☐ Eye
- ☐ Ear
- ☐ Head
- ☐ Neck
- ☐ Shoulder
- ☐ Arm
- ☐ Elbow
- ☐ Wrist
- ☐ Hand
- ☐ Fingers
- ☐ Chest
- ☐ Abdomen
- ☐ Back
- ☐ Leg
- ☐ Knee
- ☐ Ankle
- ☐ Foot
- ☐ Other:

Accident/Incident/Near Miss Report

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

DESCRIBE THE INCIDENT IN DETAIL

Attach photographs, drawings, diagrams, property damage, witness statements and any other pertinent information

FIRST AID/MEDICAL INFORMATION

Was First Aid Provided?	☐ Y ☐ N	Bloodborne Pathogens Incident?	☐ Y ☐ N
Type of First Aid Applied:		Did Kemron Respond?	☐ Y ☐ N ☐ N/A
Non-prescription medication:		Employee Exposed to:	
Who Gave the Treatment?		Blood or infectious material?	☐ Y ☐ N
Medical Treatment Given?	☐ Y ☐ N	Call to 911?	☐ Y ☐ N
(attach medical report if available)		Hospital Name/Address:	
Physician Name:		Work Limitation Given?	☐ Y ☐ N
Physician Address:		Any prescriptions prescribed?	☐ Y ☐ N
		Describe Any Work Limitation:	
Phone:		Return To Work Date:	

IMMEDIATE CORRECTIVE ACTION DESCRIPTION

Assigned To: Completion Date:

ACCIDENT REVIEW BOARD INFORMATION

Completed By: Date:

Approved By: Date:

KEMRON

KEMRON Vehicle Information

Vehicle Year, Make, Model	Vehicle VIN	License Plate No./State
Trailer Year, Make, Model	Trailer VIN	License Plate No./State

KEMRON Driver Information

Driver's Name and Address, City, State, Zip				Phone Number
Driver's License No./Sta	Sex	Date of Birth	Email Address	Work Phone

Date, Time and Place

Date of Accident	Time ☐AM ☐PM	Exact Location of Accident or Loss (Include cross-streets, mile-markers, etc.)
Was Police Dept. Involved? ☐Yes ☐No	Department Name & Contact Name	Police Report or Citations Number
Witness Name	Witness Address	Phone No.
Additional Comments		

Other Vehicles Involved

Vehicle 1		Vehicle 2	
Driver Name	Sex	Driver Name	Sex
Injuries ☐Yes ☐No		Injuries ☐Yes ☐No	
Driver Address,City, State, Zip		Driver Address,City, State, Zip	
Home Phone	Business Phone	Home Phone	Business Phone
Vehicle Year, Make, Model	License Plate/State	Vehicle Year, Make, Model	License Plate/State
Trailer Year, Make, Model	License Plate/State	Trailer Year, Make, Model	License Plate/State
Vehicle VIN	Trailer VIN	Vehicle VIN	Trailer VIN
Insurance Company	Policy Number	Insurance Company	Policy Number
Insurance Company/Phone No./Agent Name		Insurance Company/Phone No./Agent Name	

TAILGATE SAFETY MEETING

DATE: _____ TIME: 0630
CUSTOMER: U.S Army Corps of Engineers, PROJECT:
LOCATION: Former Fort Ord, CA

WEATHER FORECAST

Lo , Hi

SIGNIFICANT SAFETY ISSUES

TYPE OF WORK BEING PERFORMED

Mag and dig, Surface removal, GEO Brush removal, Escort, Demo

EMERGENCY PROCEDURES

For Emergencies (fire/major medical requiring ambulance) contact Site Safety
For minor injuries, treat and transport to the nearest medical facility:

Presidio Fire 831-242-7700

PERSONAL PROTECTIVE EQUIPMENT

LEVEL D: Work boots, safety glasses, leather gloves. (Safety-toe required during heavy equipment operations when a foot hazard exists). High visibility clothing required (i.e. Shirts). Class 2 vests when working around heavy equipment.

SAFETY & SITE EQUIPMENT

First aid kit/Eye wash/personal decon/radios/personal protective equipment/fire extinguishers.

CHEMICAL HAZARDS

THE FOLLOWING CHEMICAL CONSTITUENTS MAY BE FOUND IN SOIL, DEBRIS, AND/OR GROUNDWATER.

CHEMICAL CONSTITUENT	MSDS ON-SITE?	CARCINOGEN	SIGN'S OF EXPOSURE
Lead (Pb)	Yes	N/A	See MSDS

PHYSICAL HAZARDS

Pinch point, Heavy Equipment, Snakes, wild life, hidden holes (soft spots), slips, trips and falls UXO/WP.

WORK ZONE REQUIREMENTS

All personnel will have at a minimum UXO awareness. Exclusion zone distances between teams must be observed. Work stops for non-essential personnel. Vehicles restricted to clean areas only.

TAILGATE SAFETY MEETING

DATE: _____ TIME: 0630

CUSTOMER: U.S Army Corps of Engineers, PROJECT:

LOCATION: Former Fort Ord, CA

SIGNIFICANT SAFETY ISSUES

Safety Topic:

Personnel On-Site	Time In	Time Out	Name	Company	Signature
1					
2					
3					
4					
5					
6					
7					
8					
9					
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11					
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MEETING CONDUCTED BY:

Val Valdez/ UXOSO

Brad Olson/ SUXOS

TAILGATE SAFETY MEETING

DATE: _____ TIME: 0630

CUSTOMER: U.S Army Corps of Engineers, PROJECT:

LOCATION: Former Fort Ord, CA

SIGNIFICANT SAFETY ISSUES

Safety Topics:

Personnel On-Site	Time In	Time Out	Name	Company	Signature

*SAFETY CHECKLIST FOR FLAMMABLE AND COMBUSTIBLE MATERIALS

Contractor # and title:	
Equipment name & number: owned or leased?	
Contractor:	Subcontractor:
Contractor inspector:	Date inspected:

	This checklist references EM 385 1-1, revised 3 November 2003	Yes	No	N/A
1	Are combustible scrap, debris, and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite promptly?			
2	Is proper storage practiced to minimize the risk of fire including spontaneous combustion?			
3	Are approved containers and tanks used for the storage and handling of flammable and combustible liquids?			
4	Are all connections on drums and combustible liquid piping, vapor and liquid tight?			
5	Are all flammable liquids kept in closed containers when not in use (for example, parts cleaning tanks, pans, etc.)?			
6	Are bulk drums of flammable liquids grounded and bonded to containers during dispensing			
7	Do storage rooms for flammable and combustible liquids have explosion-proof lights?			
8	Is liquefied petroleum gas stored, handled, and used in accordance with safe practices and standards?			
9	Are "NO SMOKING" signs posted on liquefied petroleum gas tanks?			
10	Are liquefied petroleum storage tanks guarded to prevent damage from vehicles?			
11	Are all solvent wastes and flammable liquids kept in fire-resistant, covered containers until they are removed from the worksite?			
12	Is vacuuming used whenever possible rather than blowing or sweeping combustible dust? Are firm separators placed between containers of combustibles or flammables, when stacked one upon another, to assure their support and stability?			
13	Are fuel gas cylinders and oxygen cylinders separated by distance, and fire-resistant barriers, while in storage?			
14	Are fire extinguishers selected and provided for the types of materials in areas where they are to be used?			
15	Are "NO SMOKING" signs posted where appropriate in areas where flammable or combustible materials are used or stored?			
16	REMARKS:			

17	Class A Ordinary combustible material fires.			
18	Class B Flammable liquid, gas or grease fires.			
19	Class C Energized-electrical equipment fires.			
20	Are appropriate fire extinguishers mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials?			
21	Are extinguishers free from obstructions or blockage?			
22	Are all extinguishers serviced, maintained and tagged at intervals not to exceed 1 year?			
23	Are all extinguishers fully charged and in their designated places?			
24	Where sprinkler systems are permanently installed, are the nozzle heads so directed or arranged that water will not be sprayed into operating electrical switch boards and equipment?			
25	Are safety cans used for dispensing flammable or combustible liquids at a point of use?			
26	Are safety cans used for dispensing flammable or combustible liquids at a point of use?			
27	Are all spills of flammable or combustible liquids cleaned up promptly?			
28	Are storage tanks adequately vented to prevent the development of excessive vacuum or pressure as a result of filling, emptying, or atmosphere temperature changes?			
29	Are storage tanks equipped with emergency venting that will relieve excessive internal pressure caused by fire exposure?			
30	Are "NO SMOKING" rules enforced in areas involving storage and use of hazardous materials?			
	REMARKS:			

HAZARDOUS CHEMICAL INVENTORY FORM

SDS #	LOCATION	PRODUCT NAME	HAZARDOUS CHEMICALS	MANUFACTURER	DATE OF SDS

HEAT AND COLD STRESS

Heat Stress Checklist	
Work Location:	Date:
Description of Work:	
Names of All Persons Performing Task:	

Type of Work to be Performed (Check One)

- □ Light
- □ Moderate
- □ Heavy

Type of Clothing to be Worn (Check One)

- □ Regular work wear
- □ Regular Anti C's/Coveralls
- □ Impermeable clothing (paper or plastic)
- □ Other (explain) : _____

Respiratory Protection to be Worn (Check One)

- □ SCBA
- □ Respirator
- □ Other (explain) : _____

Work Area Monitoring

WBGT Temperature °F Date/Time Taken /

Work Requirements

- □ Administrative Category (Circle One) I II III IV
- □ Recommended Stay Time: _____
- □ Recommended Rest Time:
- □ Personal cooling garment
- □ Shielding
- □ Fans/blowers
- □ Fluid/electrolyte available
- □ Cool area identified
- □ Two-men required
- □ All personnel trained within the past year

Approval to Commence Work

_____ Job Supervisor's Signature

_____ General Supervisor's Signature

Operator Daily Report of Inspection

Forklift Ram Mobile Crane Ross Carrier JLG Lift

Department _____ Vehicle ID _____

Date _____

	Yes	No	N/A
Do travel brakes function properly?			
Does deadman control function properly?			
Does speed control function properly?			
Do hoist controls function properly?			
Does horn operate satisfactorily?			
Does back up alarm operate?			
Does warning light operate?			
Do lights operate if required?			
Does signal equipment operate?			
Do hoist limit switches operate properly?			
Do directional controls function properly?			
Does steering equipment operate satisfactorily?			
Does clutch function properly?			
Does emergency brake work?			
Are the control levers operable?			
Is a fire extinguisher present?			
Is the fire extinguisher gauge in the green area?			
Mast weld points in good condition?			
Roller track greased?			
Hydraulic fluid levels within operating ranges?			
Hydraulic lines not crimped or worn excessively?			
Lift and tilt cylinders sealed and in good condition?			
Mounting hardware on cylinders are secure?			
Tires in good condition?			
If pneumatic tires, inflated to proper pressure?			
Power source in good condition?			

Remarks: _____

Operator's Signature _____

PRE-STARTUP SAFETY REVIEWS

Pre-Startup Safety Inspection Checklist		
General	**YES**	**NO**
Has a written SOP been developed for operation of new or modified equipment?		
Has installation been performed in accordance with manufacturer's specifications?		
Have all tools been removed from the work area and vicinity of moving parts?		
Is equipment guarded to prevent contact with moving parts?		
Does any new or modified procedure/equipment create nip points/pinch points?		
Does any new procedure/equipment involve any hazardous substances? If yes, does an SDS exist for the substances?		
Does the procedure/equipment create an ignition source? If yes, are any combustible materials located in the area?		
Are all parts and guards properly tightened/fastened?		
Is personal protective equipment required for procedure/equipment?		
Does the process/equipment create any airborne contaminants?		
Have personnel received training in SOPs?		

Form B
Site Inspection Form

OPERATION	SAFE	UNSAFE
EQUIPMENT:	**SAFE**	**UNSAFE**
Fire Extinguisher		
Back-up Alarm		
Clean Access and Egress		
Hand Holds		
Hydraulic Leaks		
COMMUNICATION:	**SAFE**	**UNSAFE**
Radio		
Telephone		
Equipment Horn		
Hand Signals		
Verbal		
FIELD OPERATIONS:	**SAFE**	**UNSAFE**
HWP (Hazardous Work Permit)		
Hot Work Permit		
Trenching & Excavation Permit		
Lifting & Carring		
Air Monitoring		
Dust Control		
Silt Fence Installation		
WWTP		
Grading		
Compacting		
Trenching		
Excavation		
Hauling		

OPERATION	SAFE	UNSAFE
HOUSEKEEPING:	**SAFE**	**UNSAFE**
Trash		
Material Stacked to High		
Electrical Cords		
GFCI		
Tool Trailer		
Fire Extinguisher(s) Records		
PERSONAL PROTECTION EQUIPMENT:	**SAFE**	**UNSAFE**
HARD HAT		
Safety Glasses w/Sideshields		
Safety Toed Shoes		
Gloves		
Level "C" Equipment		
Ear Protection		
Tyvek		
GENERAL OBSERVATION:	**SAFE**	**UNSAFE**
Surveying		
Seeding		
Temporary Fencing		
Stop Signs		
R / R Crossings		
Speed Limits		
Fueling of Equipment		
Spotter		
Hand Tools		
F.S. Break Trailer		

ITEM:	NOTES:

SIGNITURE:_____ **DATE:**_____

FORMULA:

TOTAL SAFE + TOTAL UNSAFE = TOTAL SAMPLED TOTAL SAFE x 100 / TOTAL SAMPLED = % SAFE

SAMPLE FORMULA:

0 (SAFE) + 0 (UNSAFE) = 0 (TOTAL SAMPLED) 0 (TOTAL SAFE x 100 / 0 (TOTAL SAMPLED) = 100% (SAFE)

NOTE: This formula can also be applied to each operation to determine the largest opportunities for improvement.

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Attachment 2
Activity Hazard Analysis

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Activity Hazard Analysis (AHA)

Activity/Work Task: Task 1. Preparation of Work Plans	Overall Risk Assessment Code (RAC) (Use highest code)	L
Project Location: Fort Ord		
Contract Number: W912DY-10-D-0027 Task Order CM01		
Date Prepared: 11/19/2014		
Prepared by (Name/Title): Daniel Robinson, Project Scientist		
Reviewed by (Name/Title): Steve Fess, CIH, CSP		
Notes: (Field Notes, Review Comments, etc.) None		

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

Job Steps	Hazards	Controls	RAC
Plan Preparation / Site Meetings	Physical Exertion	Get plenty of rest. Personnel shall use proper work station equipment and take breaks during extended periods of typing and computer based work.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L

Equipment to be Used	Training	Inspection Requirements
Proper ergonomic chair and keyboard	Worker to have knowledge of proper use.	Inspect before use

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 2. Mobilization	Overall Risk Assessment Code (RAC) (Use highest code)	L
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: 11/13/2014		
Prepared by (Name/Title): James Molina, UXOSO		
Reviewed by (Name/Title): Steve Fess, CIH, CSP		
Notes: (Field Notes, Review Comments, etc.) None		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Job Steps	Hazards	Controls	RAC
Transportation of Personnel and Equipment	Vehicle Traffic (Motor vehicle accident)	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
	Loading/Unloading (pedestrian contact, vehicle or equipment damage		
	Fire Hazards	Fire extinguishers will be available in all vehicles. Transportation of fuels will be conducted using only properly labeled and approved flammable storage containers.	L
Loading/Unloading and Staging Equipment (includes, initial onsite assessment)	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L
	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L

	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	L
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified	L

Equipment to be Used	**Training**	**Inspection Requirements**
Vehicles and Trailers (as necessary)	Worker to have knowledge of proper use.	Initial vehicle inspection before use on Project. Weekly vehicle inspections will be conducted throughout project duration
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Fire Extinguisher	Worker to have knowledge of proper use.	Initial inspection before use on Project. Monthly extinguisher inspections will be conducted throughout project duration.
PPE = Level D	Worker to have knowledge of proper use.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 3. Site Preparation/Survey / Escorting	Overall Risk Assessment Code (RAC) (Use highest code)	L
Project Location: Fort Ord		
Contract Number: W912DY-10-D-0027 Task Order CM01		
Date Prepared: 11/19/2014		
Prepared by (Name/Title): Daniel Robinson, Project Scientist		
Reviewed by (Name/Title): Steve Fess, CIH, CSP		
Notes: (Field Notes, Review Comments, etc.) None		

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Vehicle Operation	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
Site Preparation / Survey / Escorting Procedures (includes, pre-Utility location and clearance; site survey to include the onsite utilities, and installation of construction project and site safety signs, as necesssary.	Fire	Fire extinguishers will be available in all vehicles. Transportation of fuels will be conducted using only properly labeled and approved flammable storage containers.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L
	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	L

	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L
	Animal/Insect/Vegetation	Rodents, snakes, stray animals, stinging insects, and poison ivy/sumac/oak are all environmental hazards that may be encountered during daily site operations. Site investigations to identify these hazards before work related activities begin are essential. Site specific procedures shall be developed should there be a reasonable potential for these hazards to exist, and implemented if encountered.	L
	Discovery of potential MEC	Halt escorted personnel and lead them away from the item. Notify appropriate personnel so a followup inspection by UXO technicians can be conducted.	L

Equipment to be Used	Training	Inspection Requirements
Vehicles and Trailers (as necessary)	Worker to have knowledge of proper use.	Initial vehicle inspection before use on Project. Weekly vehicle inspections will be conducted throughout project duration
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Fire Extinguisher	Worker to have knowledge of proper use.	Initial inspection before use on Project. Monthly extinguisher inspections will be conducted throughout project duration.
PPE = Level D	Worker to have knowledge of proper use.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task:
Task 4. Brush Clearing

Project Location:
Fort Ord

Contract Number:
W912DY-10-D-0027 Task Order CM01

Date Prepared: 11/13/2014

Prepared by (Name/Title):
James Molina, UXOSO

Reviewed by (Name/Title):
Steve Fess, CIH, CSP

Notes: (Field Notes, Review Comments, etc.)
None

Overall Risk Assessment Code (RAC) (Use highest code): **M**

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Brush Clearing and Prescribed Burns	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	M
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Splash	Personnel shall wear full splash protection consisting of face shield (over safety glasses/goggles); Tyvek; Nitrile gloves (double layered); and chemical resistant boots tapes at the joints when a risk of chemical splash is high.	L
	Hand Power Tool	Use all tools in the manner designed. Do not use damaged tools or tool with damaged cords. Wear gloves where required. Wear appropriate PPE when using Mechanical Brush cutting equipment, i.e. Chainsaw safety Chaps, hearing, eye, and face protection.	M
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points of contacts.	M
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	M

Job Steps	Hazards	Controls	RAC
	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	L
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L
	Animal/Insect/Vegetation	Rodents, snakes, stray animals, stinging insects, and poison ivy/sumac/oak are all environmental hazards that may be encountered during daily site operations. Site investigations to identify these hazards before work related activities begin are essential. Site specific procedures shall be developed should there be a reasonable potential for these hazards to exist, and implemented if encountered.	L
	Discovery of potential MEC	Halt escorted personnel and lead them away from the item. Notify appropriate personnel so a followup inspection by UXO technicians can be conducted.	L

Equipment to be Used	Training	Inspection Requirements
Vehicles and Trailers (as necessary)	Worker to have knowledge of proper use	Initial vehicle inspection before use on Project. Weekly vehicle inspections will be conducted throughout project duration
Heavy Equipment (for clearing)	Worker to have knowledge of proper use	Initial equipment inspection before use on Project. Weekly equipment inspections will be conducted throughout project duration
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Fire Extinguisher	Worker to have knowledge of proper use.	Initial inspection before use on Project. Monthly extinguisher inspections will be conducted throughout project duration
PPE = Level D	Worker to have knowledge of proper use.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 5: Surface/ Subsurface Clearance / EM61MK2 Survey	Overall Risk Assessment Code (RAC) (Use highest code)	**H**
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: 11/13/2014		
Prepared by (Name/Title): James Molina, UXOSO	**Reviewed by (Name/Title):** Steve Fess, CIH, CSP	
Notes: (Field Notes, Review Comments, etc.) None		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
General	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	M
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Splash	Personnel shall wear full splash protection consisting of face shield (over safety glasses/goggles); Tyvek; Nitrile gloves (double layered); and chemical resistant boots tapes at the joints when a risk of chemical splash is high.	L
	Hand Power Tool	Use all tools in the manner designed. Do not use damaged tools or tool with damaged cords. Wear gloves where required. Wear appropriate PPE when using Mechanical Brush cutting equipment, i.e. Chainsaw safety Chaps, hearing, eye, and face protection.	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L

	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	L
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified	L
Identify and mark surface MEC and CWM	Potential of encountering MEC/CWM	Train personnel on possible MEC and CWM item that could be found at the site.	H
Look out for possible liquid and or liquid contaminated soil.	Chemical agent.	Employ chemical agent air monitoring.	H
Inspect all MPPEH for energetics.	MEC - unintentional detonation.	SUXOS and OESS will verify inspection of suspect MEC/CWM items.	H

Equipment to be Used	Training	Inspection Requirements
Pickup Truck	Only trained personnel shall operate equipment. Ensure that drivers are given a daily safety briefing prior to work on the site.	Inspect all equipment for safe working order upon receipt. Review Vehicle Checklist
EM61MK2	Worker to have knowledge of proper use.	Inspection before use.
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
PPE - Level D	Only trained personnel shall don and conduct activities in PPE.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 6: Anomaly Detection/Excavation	Overall Risk Assessment Code (RAC) (Use highest code)	**H**
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: 11/13/2014		
Prepared by (Name/Title): James Molina, UXOSO		
Reviewed by (Name/Title): Steve Fess, CIH, CSP		
Notes: (Field Notes, Review Comments, etc.) None		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Job Steps	Hazards	Controls	RAC
General	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	M
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Splash	Personnel shall wear full splash protection consisting of face shield (over safety glasses/goggles); Tyvek; Nitrile gloves (double layered); and chemical resistant boots tapes at the joints when a risk of chemical splash is high.	L
	Hand Power Tool	Use all tools in the manner designed. Do not use damaged tools or tool with damaged cords. Wear gloves where required. Wear appropriate PPE when using Mechanical Brush cutting equipment, i.e. Chainsaw safety Chaps, hearing, eye, and face protection.	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	M
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L

	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	M
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	M
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L
Inspect Surface scrap for MEC	Identify Explosive components not safe to remove	Review all information on the item(s). Review 60 series publication if there is one for the item(s).	H
Digging	Hitting subsurface MEC	Use proper excavation procedures; use equipment properly; maintain appropriate safe separation distances.	H
Using backhoe	Struck By Backhoe	Backhoe operator must know where coworkers are at all times; workers on the ground must maintain a safe distance from the backhoe; use the buddy/spotter system with appropriate hand arm signals; wear hard hat and high-visibility vests or clothing.	M
	Loss of hearing	Wear hearing protection.	
	Hitting subsurface MEC	Mechanical excavate to the side of the anomaly to the depth of 12 inches from the anomaly. Hand excavate when within 12 inches of the	
	Exposure to Crystalline Silica	During active excavation, soil disturbance and corresponding dust generation should be kept minimal. However, if dust becomes a problem during soil removal or transport activities, then dust control measures, such as spraying water, will be implemented at the source of the dust. Additionally, engineering controls such as providing local ventillation may be implemented to reduce dust levels in the workers breathing space. If dust levels persist, then monitoring programs for dust concentrations and employee exposure may be implemented.	M

Equipment to be Used	**Training**	**Inspection Requirements**
Pickup Truck	Only trained personnel shall operate equipment. Ensure that drivers are given a daily safety briefing prior to work on the site.	Inspect all equipment for safe working order upon receipt. Review Vehicle Checklist.
Hand Tools	Worker to have knowledge of proper use	Inspection before use.
Heavy Equipment	Worker to have knowledge of proper use.	Inspect all equipment for safe working order upon receipt and daily thereafter. All equipment shall have rollover protection, direction warning systems, and seat belts. Review the Heavy Equipment and Drilling Equipment Checklist.
PPE - Level D	Only trained personnel shall don and conduct activities in PPE.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 7: Mechanical Soil Screening	Overall Risk Assessment Code (RAC) (Use highest code)	**H**
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: 11/13/2014	Frequent / Likely / Occasional / Seldom / Unlikely	
Prepared by (Name/Title): James Molina, UXOSO	Catastrophic: E / E / H / H / M	
	Critical: E / H / H / M / L	
Reviewed by (Name/Title): Steve Fess, CIH, CSP	Marginal: H / M / M / L / L	
	Negligible: M / L / L / L / L	
Notes: (Field Notes, Review Comments, etc.) None	**Step 1**: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk**
		H = High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk**
		L = Low Risk

Job Steps	Hazards	Controls	RAC
General	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	M
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Splash	Personnel shall wear full splash protection consisting of face shield (over safety glasses/goggles); Tyvek; Nitrile gloves (double layered); and chemical resistant boots tapes at the joints when a risk of chemical splash is high.	L
	Hand Power Tool	Use all tools in the manner designed. Do not use damaged tools or tool with damaged cords. Wear gloves where required. Wear appropriate PPE when using Mechanical Brush cutting equipment, i.e. Chainsaw safety Chaps, hearing, eye, and face protection.	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	M
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L

	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	M
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	M
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L
Mechanical Soil Screening Process	Vibratory Power Screen Operations	Only Qualified/authorized personnel shall operate Power Screen/Trommel. The UXOSO will determine the need for hearing protection and conduct monitoring if needed. All equipment will be equipped with manufacturer's required mufflers All Screens and guards shall be in place to prevent personnel from entering or being caught inside machine. The area around loading/unloading shall be kept clear of obstructions and slip/trip/fall hazards. During the screening process, only qualified and authorized personnel shall handle MEC. All personnel shall know the emergency shutoff/kill switch locations and how to operate them.	H
	Conveyors	Only Qualified/authorized personnel shall operate conveyors No maintenance shall be performed while the conveyor is in operation except when lubrication/adjustments are necessary while the conveyor needs to be in motion and only when all safeguards are in place and is done by experienced/trained maintenance personnel. Inspection, maintenance, and repairs will be in accordance with manufacturer's recommendations. Where reversing, runaway, or uncontrolled lowering are potential hazards, anti-runaway devices, breaks, backstops, or other safeguards shall be installed. Safety devices shall be arranged to operate in such a manner that, if a power failure or a failure of the device occurs, a hazardous condition would not result. All take-up mechanisms (contact with cables, chains, belts) and nip and shear points shall be guarded. Keep hands and all body parts away from moving parts and pinch points Riding on conveyors is prohibited. Shutoff switches shall be tested and witnessed by the supervisor prior to starting work.	H
	Exposure to Crystalline Silica	During active excavation, soil disturbance and corresponding dust generation should be kept minimal. However, if dust becomes a problem during soil removal or transport activities, then dust control measures, such as spraying water, will be implemented at the source of the dust. Additionally, engineering controls such as providing local ventillation may be implemented to reduce dust levels in the workers breathing space. If dust levels persist, then monitoring programs for dust concentrations and employee exposure may be implemented.	M

Equipment to be Used	Training	Inspection Requirements
Pickup Truck	Only trained personnel shall	Inspect all equipment for safe working order upon receipt. Review Vehicle Checklist.

	operate equipment. Ensure that drivers are given a daily safety briefing prior to work on the site.	
Hand Tools	Worker to have knowledge of proper use	Inspection before use.
Heavy Equipment	Worker to have knowledge of proper use.	Inspect all equipment for safe working order upon receipt and daily thereafter. All equipment shall have rollover protection, direction warning systems, and seat belts. Review the Heavy Equipment and Drilling Equipment Checklist.
PPE - Level D	Only trained personnel shall don and conduct activities in PPE.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 8: MEC Disposal	Overall Risk Assessment Code (RAC) (Use highest code)	**H**
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: **11**/13/2014		
Prepared by (Name/Title): James Molina, UXO Safety Officer	**Reviewed by (Name/Title):** Steve Fess, CIH, CSP	
Notes: (Field Notes, Review Comments, etc.) None		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
General	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items	M
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Splash	Personnel shall wear full splash protection consisting of face shield (over safety glasses/goggles); Tyvek; Nitrile gloves (double layered); and chemical resistant boots tapes at the joints when a risk of chemical splash is high.	L
	Hand Power Tool	Use all tools in the manner designed. Do not use damaged tools or tool with damaged cords. Wear gloves where required. Wear appropriate PPE when using Mechanical Brush cutting equipment, i.e. Chainsaw safety Chaps, hearing, eye, and face protection.	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	M
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points of contacts.	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L

Conduct Demolition and	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	M
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L
	Unintentional Detonation	Conduct demolition operations IAW approved SOP's for electric or NONEL initiation.	H
	Intentional Detonation	Observe appropriate MSDs; implement engineering controls as applicable; notify appropriate installation personnel of demolition operations; post road guards if MSD encroaches on public/private roads.	H
	Fire	Observe fire prevention SOP; provide ABC (or equivalent) fire extinguishers for all work; conduct postdemolition fire watch; when appropriate based on site conditions, have local firefighting professionals on standby to react to unintentional fires.	M

Equipment to be Used	**Training**	**Inspection Requirements**
Pickup Truck	Only trained personnel shall operate equipment. Ensure that drivers are given a daily safety briefing prior to work on the site.	Inspect all equipment for safe working order upon receipt. Review Vehicle Checklist.
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Heavy Equipment	Worker to have knowledge of proper use.	Inspect all equipment for safe working order upon receipt and daily thereafter. All equipment shall have rollover protection, direction warning systems, and seat belts. Review the Heavy Equipment and Drilling Equipment Checklist.
Air Monitoring Equipment	Only Trained Personnel	Inspection before Use.
PPE - Level D	Only trained personnel shall don and conduct activities in PPE.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 9. MPPEH Certification and Shipping	Overall Risk Assessment Code (RAC) (Use highest code)	**H**
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: 11/13/2014		
Prepared by (Name/Title): James Molina, UXO Safety Officer	**Reviewed by (Name/Title):** Steve Fess, CIH, CSP	
Notes: (Field Notes, Review Comments, etc.) None		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
General	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	H
	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	L

	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L
Inspect all MPPEH for Energetics.	MEC - unintentional detonation	Safe work practices. Wear cut resistant gloves.	H
Prepare/load MDAS Containers.	Working near heavy equipment.	Wear reflective warning vests when exposed to vehicular traffic; isolate equipment swing areas; make eye contact with operator before approaching equipment; barricade or enclose the work area; restrict work area to authorized personnel only; wear appropriate PPE.	M

Equipment to be Used	Training	Inspection Requirements
Pickup Truck	Only trained personnel shall operate equipment. Ensure that drivers are given a daily safety briefing prior to work on the site.	Inspect all equipment for safe working order upon receipt. Review Vehicle Checklist.
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Heavy Equipment	Worker to have knowledge of proper use.	Inspect all equipment for safe working order upon receipt and daily thereafter. All equipment shall have rollover protection, direction warning systems, and seat belts. Review the Heavy Equipment and Drilling Equipment Checklist.
Air Monitoring Equipment	Only Trained Personnel	Inspection before Use.
PPE -Level D	Only trained personnel shall don and conduct activities in PPE.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 10: Soil Sampling	Overall Risk Assessment Code (RAC) (Use highest code)	**L**
Project Location: Fort Ord	**Risk Assessment Code (RAC) Matrix**	
Contract Number: W912DY-10-D-0027 Task Order CM01	**Severity** / **Probability**	
Date Prepared: 11/13/2014		
Prepared by (Name/Title): James Molina, UXOSO		
Reviewed by (Name/Title): Steve Fess, CIH, CSP		
Notes: (Field Notes, Review Comments, etc.) None		

Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Soil Sampling	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items	L
	Heat/Cold Stress	Personnel shall be trained on the signs and symptoms of heat/cold stress. An effective work/rest schedule will be implemented to regulate weather exposures. Fluids will be provided. Employees will be encouraged to refrain from alcohol use after work hours.	L
	Splash	Personnel shall wear full splash protection consisting of face shield (over safety glasses/goggles); Tyvek; Nitrile gloves (double layered); and chemical resistant boots tapes at the joints when a risk of chemical splash is high.	L
	Hand Power Tool	Use all tools in the manner designed. Do not use damaged tools or tool with damaged cords. Wear gloves where required. Wear appropriate PPE when using Mechanical Brush cutting equipment, i.e. Chainsaw safety Chaps, hearing, eye, and face protection.	L
	Fire Hazards (Burns, Flash Fires)	Daily safety meeting will be held to document the potential for fire emergencies. Firefighting equipment will be staged nearby in the event of an emergency. The local Fire Department will be notified in advance of any hot work activities, or during activities which could potentially create fire. Air monitoring will be conducted during hot work operations to warn of an explosive atmosphere. Only personnel directly involved in the operations will be allowed in the area.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L

	High Noise	Use of hearing protection will be worn when employees are exposed to high noise levels (greater than 85 dBA as a Time Weighted Average over an 8-hour work day). The need for employees to use dual hearing protection can be monitored by using a Noise Reduction Rating (NRR) calculation for Hearing Protective Devices (HPD) to estimate the attenuation afforded to a noise-exposed employee using muffs, plugs, or a combination of both using guidelines found at https://www.osha.gov/dts/osta/otm/noise/hcp/attenuation_estimation.html, and the actual onsite Sound Pressure Level (measured in dBA)."	L
	Contact with Overhead / Underground Utilities (Explosion, gas leak, sewage release)	Identify all onsite utilities prior to any site activities. Ensure that all underground utility markings are clearly visible and maintained throughout the duration of work. Communicate with utility providers before conducting any overhead or underground work. Cease work immediately if utility markers are encountered.	L
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L

Equipment to be Used	Training	Inspection Requirements
Pickup Truck	Only trained personnel shall operate equipment. Ensure that drivers are given a daily safety briefing prior to work on the site.	Inspect all equipment for safe working order upon receipt. Review Vehicle Checklist.
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Sampling Equipment	Worker to have knowledge of proper use.	Inspect all equipment for safe working order upon receipt and daily thereafter.
PPE - Level D	Only trained personnel shall don and conduct activities in PPE.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task: Task 11. Site Restoration	Overall Risk Assessment Code (RAC) (Use highest code)	L
Project Location: Fort Ord		
Contract Number: W912DY-10-D-0027 Task Order CM01		
Date Prepared: 11/19/2014		
Prepared by (Name/Title): Daniel Robinson, Project Scientist		
Reviewed by (Name/Title): Steve Fess, CIH, CSP		
Notes: (Field Notes, Review Comments, etc.) None		

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Site Restoration (includes, removing temporary site featureas, backfilling and final grading, and vegetative cover placement)	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L
	Severe Weather (exposure, lightning strike, high winds)	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L

Equipment to be Used	Training	Inspection Requirements
Vehicles and Trailers (as necessary)	Worker to have knowledge of proper use.	Initial vehicle inspection before use on Project. Weekly vehicle inspections will be conducted throughout project duration
Heavy Equipment (for grading)	Worker to have knowledge of proper use.	Initial equipment inspection before use on Project. Weekly equipment inspections will be conducted throughout project duration
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
Fire Extinguisher	Worker to have knowledge of proper use.	Initial inspection before use on Project. Monthly extinguisher inspections will be conducted throughout project duration.
PPE = Level D	Worker to have knowledge of proper use.	Inspection before use.

Activity Hazard Analysis (AHA)

Activity/Work Task:
Task 12. Demobilize Equipment and Personnel

Project Location:
Fort Ord

Contract Number:
W912DY-10-D-0027 Task Order CM01

Date Prepared: 11/19/2014

Prepared by (Name/Title):
Daniel Robinson, Project Scientist

Reviewed by (Name/Title):
Steve Fess, CIH, CSP

Notes: (Field Notes, Review Comments, etc.)
None

Overall Risk Assessment Code (RAC) (Use highest code): **L**

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Transportation of personnel and equipment	Vehicle Traffic (Motor vehicle accident) Loading/Unloading (pedestrian contact, vehicle or equipment damage	Always wear high visibility clothing when exposed to vehicular traffic. Be alert to material and equipment loading/unloading hazards and moving equipment. Use a spotter to aid in unloading and to watch for overhead and backing hazards, and pedestrian/vehicular traffic. Vehicles will obey all speed limits and will be operated in a non-reckless manner. No vehicle will be overloaded or loaded in such a way as to obscure the view of the driver.	L
Breakdown Equipment	Lifting Hazards (Strains, Sprains)	Personnel shall use proper lifting techniques such as keeping back straight, using legs to lift, limiting twisting, using mechanical means where possible, and getting help when handling bulky items.	L
	Slips, Trips, and Falls	Keep work areas clear of debris. Provide adequate illumination of work areas. Slip, trip, and fall hazards should be marked, removed, or protected. Housekeeping procedures will be completed and documented to reduce hazards. Work will not be permitted on slick surfaces. Heavy equipment will be exited slowly maintaining 3-points of contacts.	L
	Puncture / Laceration	Proper hand protection will be worn to minimize the possibility of injuries due to cuts and abrasions. Potential pinch points will be identified and marked to avoid injury.	L
	Severe Weather	Weather forecasts to be monitored for predicted inclement weather. All personnel to be aware of forecasts. Work to be stopped in event of high winds, rough water, lightning or thunder identified.	L

Equipment to be Used	Training	Inspection Requirements
Vehicles and Trailers (as necessary)	Worker to have knowledge of proper use.	Initial vehicle inspection before use on Project. Weekly vehicle inspections will be conducted throughout project duration.
Hand Tools	Worker to have knowledge of proper use.	Inspection before use.
PPE = Level D	Worker to have knowledge of proper use.	Inspection before use.

Attachment 3
Safety Data Sheets

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New Jersey Department of Health and Senior Services

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **CYCLOTETRAMETHYLENE-TETRANITRAMINE**

CAS Number: 2691-41-0
DOT Number: UN 0226 (Wetted)
UN 0484 (Desensitized)

RTK Substance number: 0589
Date: April 2004

HAZARD SUMMARY

* **Cyclotetramethylenetetranitramine** can affect you when breathed in and may be absorbed through the skin.
* Contact can irritate the skin and eyes.
* Breathing **Cyclotetramethylenetetranitramine** can irritate the nose and throat.
* **Cyclotetramethylenetetranitramine** is a HIGHLY FLAMMABLE and REACTIVE CHEMICAL and a DANGEROUS FIRE and EXPLOSION HAZARD.

IDENTIFICATION

Cyclotetramethylenetetranitramine is a colorless to white crystalline (sand-like) solid. It is used as a military explosive.

REASON FOR CITATION

* **Cyclotetramethylenetetranitramine** is on the Hazardous Substance List because it is cited by DOT and IRIS.
* This chemical is on the Special Health Hazard Substance List because it is **FLAMMABLE** and **REACTIVE**.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.1020.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

No occupational exposure limits have been established for **Cyclotetramethylenetetranitramine**. This does not mean that this substance is not harmful. Safe work practices should always be followed.

* It should be recognized that **Cyclotetramethylenetetranitramine** can be absorbed through your skin, thereby increasing your exposure.

WAYS OF REDUCING EXPOSURE

* Enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to **Cyclotetramethylenetetranitramine** and at the end of the workshift.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Cyclotetramethylenetetranitramine** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Cyclotetramethylenetetranitramine:**

* Contact can irritate the skin and eyes.
* Breathing **Cyclotetramethylenetetranitramine** can irritate the nose and throat.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Cyclotetramethylenetetranitramine** and can last for months or years:

Cancer Hazard

* According to the information presently available to the New Jersey Department of Health and Senior Services, **Cyclotetramethylenetetranitramine** has not been tested for its ability to cause cancer in animals.

Reproductive Hazard

* According to the information presently available to the New Jersey Department of Health and Senior Services, **Cyclotetramethylenetetranitramine** has not been tested for its ability to affect reproduction.

Other Long-Term Effects

* No chronic (long-term) health effects are known at this time.

MEDICAL

Medical Testing

There is no special test for this chemical. However, if illness occurs or overexposure is suspected, medical attention is recommended.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.1020.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Where possible, automatically transfer **Cyclotetramethylenetetranitramine** from drums or other storage containers to process containers.
* Before entering a confined space where **Cyclotetramethylenetetranitramine** may be present, check to make sure that an explosive concentration does not exist.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by **Cyclotetramethylenetetranitramine** should change into clean clothing promptly.
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to **Cyclotetramethylenetetranitramine.**
* Eye wash fountains should be provided in the immediate work area for emergency use.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* On skin contact with **Cyclotetramethylenetetranitramine,** immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted **Cyclotetramethylenetetranitramine,** whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where **Cyclotetramethylenetetranitramine** is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating, drinking, smoking, or using the toilet.
* Use a wet method to reduce dust during clean-up. DO NOT DRY SWEEP.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with **Cyclotetramethylenetetranitramine**. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

* Wear impact resistant eye protection with side shields or goggles.
* Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* NIOSH has established new testing and certification requirements for negative pressure, air purifying, particulate filter and filtering facepiece respirators. The filter classifications of dust/mist/fume, paint spray or pesticide prefilters, and filters for radon daughters, have been replaced with the N, R, and P series. Each series has three levels of filtering efficiency: 95%, 99%, and 99.9%. Check with your safety equipment supplier or your respirator manufacturer to determine which respirator is appropriate for your facility.
* If while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Cyclotetramethylenetetranitramine**, or if while wearing particulate filters abnormal resistance to breathing is experienced, or eye irritation occurs while wearing a full facepiece respirator, leave the area immediately. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter or cartridge. If the seal is no longer good, you may need a new respirator.
* Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
* Where the potential for high exposure exists, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

HANDLING AND STORAGE

* Prior to working with **Cyclotetramethylenetetranitramine** you should be trained on its proper handling and storage.
* **Cyclotetramethylenetetranitramine** may explode if exposed to SHOCK, FRICTION or HEAT.
* **Cyclotetramethylenetetranitramine** is not compatible with METAL SALTS (such as MERCURY FULMINATE) and OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE).
* Store in tightly closed containers in a cool, well-ventilated area away from COMBUSTIBLES.
* Do not move damaged containers.
* Sources of ignition, such as smoking and open flames, are prohibited where **Cyclotetramethylenetetranitramine** is used, handled, or stored.
* Metal containers involving the transfer of **Cyclotetramethylenetetranitramine** should be grounded and bonded.
* Use only non-sparking tools and equipment, especially when opening and closing containers of **Cyclotetramethylenetetranitramine**.
* Wherever **Cyclotetramethylenetetranitramine** is used, handled, manufactured, or stored, use explosion-proof electrical equipment and fittings.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?

A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?

A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?

A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. This may be a problem for children or people who are already ill.

The following information is available from:

New Jersey Department of Health and Senior Services
Occupational Health Service
PO Box 360
Trenton, NJ 08625-0360
(609) 984-1863
(609) 984-7407 (fax)

Web address: http://www.state.nj.us/health/eoh/odisweb/

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call personnel at the Department of Health and Senior Services, Occupational Health Service, who can help you find the information you need.

Public Presentations
Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know Survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

CFR is the Code of Federal Regulations, which consists of the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

IRIS is the Integrated Risk Information System database of the federal EPA.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEL is the Permissible Exposure Limit which is enforceable by the Occupational Safety and Health Administration.

PIH is a DOT designation for chemicals which are Poison Inhalation Hazards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

>>>>>>>>>>>>>>>>>> EMERGENCY INFORMATION <<<<<<<<<<<<<<<<<

Common Name: **CYCLOTETRAMETHYLENE-TETRANITRAMINE**
DOT Number: **UN 0226 (Wetted)**
UN 0484 (Desensitized)
NAERG Code: **112**
CAS Number: **2691-41-0**

Hazard rating	NJDHSS	NFPA
FLAMMABILITY	4	-
REACTIVITY	4	-
EXPLOSIVE FLAMMABLE AND REACTIVE POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* **Cyclotetramethylenetetranitramine** is a HIGHLY FLAMMABLE and REACTIVE EXPLOSIVE which can be detonated by *heat, shock* or *friction.*
* Evacuate area and flood with water.
* POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides.*
* CONTAINERS MAY EXPLODE IN FIRE.
* Use water spray to keep fire-exposed containers cool.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If **Cyclotetramethylenetetranitramine** is spilled, take the following steps:

* Evacuate all persons from area of spill until clean-up is complete.
* Remove all ignition sources.
* DO NOT CLEAN UP OR DISPOSE OF EXCEPT UNDER SUPERVISION OF A SPECIALIST.
* Keep **Cyclotetramethylenetetranitramine** out of a confined space, such as a sewer, because of the possibility of an explosion, unless the sewer is designed to prevent the build-up of explosive concentrations.
* It may be necessary to contain and dispose of **Cyclotetramethylenetetranitramine** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
* If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: 1-877-WARN-DEP

HANDLING AND STORAGE (See page 3)

FIRST AID

For POISON INFORMATION call 1-800-222-1222

Eye Contact
* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact
* Remove contaminated clothing. Wash contaminated skin with soap and water.

Breathing
* Remove the person from exposure.
* Transfer promptly to a medical facility.

PHYSICAL DATA

Flash Point: Explosive
Water Solubility: Slightly soluble

OTHER COMMONLY USED NAMES

Chemical Name:
1,3,5,7-Tetrazocine, Octahydro-1,3,5,7-Tetranitro-
Other Names:
HMX; Octogen

NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES
Right to Know Program
PO Box 368, Trenton, NJ 08625-0368
(609) 984-2202

Right to Know
Hazardous Substance Fact Sheet

Common Name: **LEAD**

Synonym: Metallic Lead

Chemical Name: Lead

Date: September 2001 Revision: September 2007

CAS Number: 7439-92-1

RTK Substance Number: 1096

DOT Number: UN 3077

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Description and Use

Lead is a heavy, soft, silvery-gray metal. It is used in the production of storage batteries, ammunition, cable covering, pigments, glass, ceramic glazes, casting metals, and solders.

Hazard Summary

Hazard Rating	NJDOH	NFPA
HEALTH	4	-
FLAMMABILITY	0	-
REACTIVITY	0	-
CARCINOGEN TERATOGEN POISONOUS FUMES ARE PRODUCED IN FIRE DOES NOT BURN		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

Reasons for Citation

- **Lead** is on the Right to Know Hazardous Substance List because it is cited by OSHA, ACGIH, DOT, NIOSH, NTP, DEP, IARC, IRIS and EPA.
- This chemical is on the Special Health Hazard Substance List.

- **Lead** can affect you when inhaled or swallowed.
- **Lead** is a CARCINOGEN and may be a TERATOGEN. HANDLE WITH EXTREME CAUTION.
- Contact can irritate the eyes.
- Exposure can cause headache, irritability, and muscle and joint pain.
- Repeated exposure can cause *Lead poisoning* with metallic taste, colic and muscle cramps.
- **Lead** may damage the nervous system.
- Exposure may cause kidney and brain damage, and anemia.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

- Immediately flush with large amounts of cool water for at least 15 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact

- Remove contaminated clothing. Wash contaminated skin with soap and water.

Inhalation

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit (PEL) is **0.05 mg/m^3** averaged over an 8-hour workshift.

NIOSH: The recommended airborne exposure limit (REL) is **0.05 mg/m^3** averaged over a 10-hour workshift. Air concentrations should be maintained so that blood **Lead** is less than **0.06 mg per 100 grams** of whole blood.

ACGIH: The threshold limit value (TLV) is **0.05 mg/m^3** averaged over an 8-hour workshift.

- **Lead** is a PROBABLE CARCINOGEN in humans and may be a TERATOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

Determining Your Exposure

- Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility's RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) requires private employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to **Lead**:

- Contact can irritate the eyes.
- **Lead** can cause headache, irritability, reduced memory, disturbed sleep, and mood and personality changes.
- Exposure can cause upset stomach, poor appetite, weakness and fatigue.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to **Lead** and can last for months or years:

Cancer Hazard
- **Lead** is a PROBABLE CARCINOGEN in humans. There is some evidence that **Lead** and *Lead compounds* cause lung, stomach, brain and kidney cancers in humans and they have been shown to cause kidney cancer in animals.
- Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard
- **Lead** may be a TERATOGEN in humans since it is a teratogen in animals.
- It may decrease fertility in males and females, and damage the developing fetus and the testes (male reproductive glands).

Other Effects
- Repeated exposure to **Lead** can cause *Lead poisoning.* Symptoms include metallic taste, poor appetite, weight loss, colic, nausea, vomiting, and muscle cramps.
- Higher levels can cause muscle and joint pain, and weakness.
- High or repeated exposure may damage the nerves causing weakness, "pins and needles," and poor coordination in the arms and legs.
- **Lead** exposure increases the risk of high blood pressure.
- **Lead** may cause kidney and brain damage, and damage to the blood cells causing anemia.
- Repeated exposure causes **Lead** to accumulate in the body. It can take years for the body to get rid of excess **Lead**.

Medical

Medical Testing
Before first exposure, and every six (6) months thereafter, OSHA requires your employer to provide (for persons exposed to **30 micrograms** or more of *Lead* **per cubic meter** of air):

- Blood *Lead* test
- ZPP (a special test for the effects of *Lead* on blood cells)

For employees with blood *Lead* levels above **40 micrograms per 100 grams** of whole blood (**40 micrograms per deciliter**), OSHA requires blood *Lead* level monitoring every two months until two consecutive blood *Lead* levels are below **40 micrograms per 100 grams** of whole blood. These employees must undergo a medical evaluation, which should include:

- Complete work and medical history
- Thorough physical examination, including examination of the central nervous system
- Blood *Lead* test
- ZPP
- Hemoglobin, hematocrit with complete blood count
- Urinalysis with microscopic examination
- Any other tests determined necessary by the examining physician

This evaluation should be performed at least annually.

OSHA requires your employer to provide you and your doctor with a copy of the OSHA Lead Standards (29 CFR 1910.1025 and 1926.62).

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Mixed Exposures

Body exposures to *Lead* from hobbies using *Lead* solder or pigments, target practice, and drinking moonshine made in *Leaded* containers will increase *Lead* levels. Repeated breathing or handling of *Leaded* gasoline may also add to body *Lead* levels.

Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA **Lead** Standards (29 CFR 1910.1025 and 1926.62).
- Use a vacuum or a wet method to reduce dust during clean-up. DO NOT DRY SWEEP.
- Use a high efficiency particulate air (HEPA) filter when vacuuming. Do not use a standard shop vacuum.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

- Avoid skin contact with **Lead**. Wear personal protective equipment made from material which can not be permeated and/or degraded by this substance. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- Safety equipment manufacturers recommend *Nitrile*, *Latex*, or *Rubber* for gloves and DuPont *Tyvek*® as protective material for clothing.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- Wear non-vented, impact resistant goggles when working with fumes, gases, or vapors.
- For impact hazards (such as flying fragments, chips or particles), wear safety glasses with side shields or safety goggles.
- Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- Where the potential exists for exposure not higher than **0.5 mg/m^3**, use a half-mask air purifying respirator equipped with high efficiency filters.
- Where the potential exists for exposure not higher than **2.5 mg/m^3**, use a full facepiece, air purifying respirator with high efficiency filters.
- Where the potential exists for exposure not higher than **50 mg/m^3**, use any powered-air purifying respirator with high efficiency filters or a half-mask supplied-air respirator operated in a positive pressure mode.
- Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Lead**, (2) while wearing particulate filters abnormal resistance to breathing is experienced, or (3) eye irritation occurs while wearing a full facepiece respirator. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter or cartridge. If the seal is no longer good, you may need a new respirator.
- Be sure to consider all potential sources of exposure in your workplace. You may need a combination of filters, prefilters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- Where the potential exists for exposure greater than **50 mg/m^3** but less than **100 mg/m^3**, use supplied-air respirators with full facepiece, hood, helmet or suit, operated in a positive pressure mode.
- Where the potential exists for exposure greater than **100 mg/m^3**, use full facepiece, self-contained breathing apparatus operated in a positive pressure mode.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- Extinguish fire using an agent suitable for type of surrounding fire. **Lead** itself does not burn.
- POISONOUS FUMES ARE PRODUCED IN FIRE, including *Lead Oxides*.
- Use water spray to keep fire-exposed containers cool.

Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **Lead** is spilled, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- Collect spilled material using a HEPA-filter vacuum and deposit into sealed containers.
- Ventilate and wash area after clean-up is complete.
- It may be necessary to contain and dispose of **Lead** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **Lead** you should be trained on its proper handling and storage.

- A regulated, marked area should be established where **Lead** is handled, used, or stored.
- **Lead** reacts violently with HYDROGEN PEROXIDE; AMMONIUM NITRATE; ZIRCONIUM; SODIUM AZIDE; SODIUM ACETYLIDE; and CHLORINE TRIFLUORIDE.
- **Lead** is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC).
- Store in tightly closed containers in a cool, well-ventilated area.

Occupational Health Services Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.state.nj.us
Web address: http://www.nj.gov/health/eoh/rtkweb

GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database by federal EPA. The database contains information on human health effects that may result from exposure to various chemicals in the environment.

LEL or **Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

PIH is a DOT designation for chemicals which are Poison Inhalation Hazards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Hydrogen*), at the same temperature and pressure.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

NJ Health
New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **LEAD**

Synonym: Metallic Lead
CAS No: 7439-92-1
Molecular Formula: Pb_2
RTK Substance No: 1096
Description: Heavy, soft, silvery-gray metal

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
4 - Health **0 - Fire** **0 - Reactivity** **DOT#:** UN 3077 **ERG Guide #:** 171 **Hazard Class:** 9 (Environmentally Hazardous Substance)	Extinguish fire using an agent suitable for type of surrounding fire. **Lead** itself does not burn. POISONOUS FUMES ARE PRODUCED IN FIRE, including *Lead Oxides*. Use water spray to keep fire-exposed containers cool.	**Lead** reacts violently with HYDROGEN PEROXIDE; AMMONIUM NITRATE; ZIRCONIUM; SODIUM AZIDE; SODIUM ACETYLIDE; and CHLORINE TRIFLUORIDE. **Lead** is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE) and STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC).

SPILL/LEAKS

Isolation Distance: 10 to 25 meters (30 to 80 feet)

Use a HEPA-filter vacuum for clean-up.

Toxic to aquatic organisms.

Hazardous to the environment and persists in the environment.

PHYSICAL PROPERTIES

Odor Threshold:	No odor
Flash Point:	Not combustible
LEL:	N/A
UEL:	N/A
Specific Gravity:	11.35 at 68°F (20°C)
Vapor Pressure:	0 mm Hg at 68°F (20°C)
Water Solubility:	Insoluble
Boiling Point:	3,164°F (1,740°C)
Melting Point:	621.5°F (327.5°C)

EXPOSURE LIMITS

OSHA:	0.05 mg/m^3, 8-hr TWA
NIOSH:	0.05 mg/m^3, 10-hr TWA
ACGIH:	0.05 mg/m^3, 8-hr TWA
IDLH LEVEL:	100 mg/m^3

PROTECTIVE EQUIPMENT

Gloves:	Nitrile, Latex, Rubber
Coveralls:	DuPont *Tyvek*®
Boots:	Latex, Butyl, Neoprene
Respirator:	<0.5 mg/m^3 - N100
	>0.5 mg/m^3 - full facepiece APR with High Efficiency filters
	>50 mg/m^3 but ≤100 mg/m^3 Supplied Air

HEALTH EFFECTS

Eyes:	Irritation
Skin:	No Information
Acute:	Headache, irritability, upset stomach, and weakness
Chronic:	*Lead* may cause lung, brain, stomach, and kidney cancer in humans.
	Metallic taste, colic, muscle cramps
	Damage to the nervous system

FIRST AID AND DECONTAMINATION

Remove the person from exposure.

Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn.

Remove contaminated clothing and wash contaminated skin with soap and water.

Transfer to a medical facility.

Right to Know
Hazardous Substance Fact Sheet

Common Name: **CYCLONITE**

Synonyms: Hexogen; RDX

Chemical Name: 1,3,5-Triazine, Hexahydro-1,3,5-Trinitro-

Date: January 1999 Revision: July 2008

CAS Number: 121-82-4

RTK Substance Number: 0579

DOT Number: UN 0483

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Description and Use

Cyclonite is a white, crystalline (sand-like) powder. It is used as a rat poison (rodenticide) and as a powerful military explosive. It is also used as a base charge for detonators and in plastic explosives.

Hazard Summary

Hazard Rating	NJDOH	NFPA
HEALTH	2	-
FLAMMABILITY	*	-
REACTIVITY	*	-
* EXPLOSIVE CARCINOGEN POISONOUS GASES ARE PRODUCED IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

Reasons for Citation

- **Cyclonite** is on the Right to Know Hazardous Substance List because it is cited by ACGIH, DOT, NIOSH and IRIS.
- This chemical is on the Special Health Hazard Substance List.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

- Immediately flush with large amounts of water for at least 15 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact

- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Inhalation

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

- **Cyclonite** can affect you by inhalation and may be absorbed through the skin.
- **Cyclonite** should be handled as a CARCINOGEN--WITH EXTREME CAUTION.
- **Cyclonite** can irritate the skin causing a rash or burning feeling on contact.
- Exposure can irritate the eyes, nose and throat.
- Exposure to **Cyclonite** can cause headache, nausea, vomiting and loss of appetite.
- **Cyclonite** can cause weakness, confusion, dizziness and seizures (fits).
- **Cyclonite** may affect the liver and kidneys.
- Exposure to high levels may damage the nervous system.

Workplace Exposure Limits

NIOSH: The recommended airborne exposure limit (REL) is **1.5 mg/m^3** averaged over a 10-hour workshift and **3 mg/m^3**, not to be exceeded during any 15-minute work period.

ACGIH: The threshold limit value (TLV) is **0.5 mg/m^3** averaged over an 8-hour workshift.

- **Cyclonite** may be a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.
- The above exposure limits are for air levels only. When skin contact also occurs, you may be overexposed, even though air levels are less than the limits listed above.

Determining Your Exposure

- Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility's RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to **Cyclonite**:

- **Cyclonite** can irritate the skin causing a rash or burning feeling on contact.
- Exposure can irritate the eyes, nose and throat.
- Exposure to **Cyclonite** can cause headache, nausea, vomiting and loss of appetite.
- **Cyclonite** can cause weakness, confusion, irritability, dizziness, fatigue, and seizures (fits).

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to **Cyclonite** and can last for months or years:

Cancer Hazard
- **Cyclonite** may be a CARCINOGEN in humans since it has been shown to cause liver cancer in animals.
- Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard
- There is limited evidence that **Cyclonite** may damage the male reproductive system (including decreasing the sperm count) in animals.

Other Effects
- **Cyclonite** may affect the liver and kidneys
- Exposure to high levels may damage the nervous system.

Medical

Medical Testing
Before beginning employment and at regular times thereafter, (at least annually), the following are recommended:

- Liver and kidney function tests

If symptoms develop or overexposure is suspected, the following is recommended:

- Exam of the nervous system

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Mixed Exposures
- More than light alcohol consumption can cause liver damage. Drinking alcohol may increase the liver damage caused by **Cyclonite**.

Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA *Explosive and Blasting Agents* Standard (29 CFR 1910.109).
- Use only in a closed system to prevent deposition of dust.
- Use shoe cleaning mats to prevent bringing metal or gritty dirt into the workplace. Keep floors clean.
- Before entering a confined space where **Cyclonite** may be present, check to make sure that an explosive concentration does not exist.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

- Avoid skin contact with **Cyclonite**. Wear personal protective equipment made from material that can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.
- Safety equipment manufacturers recommend Neoprene for gloves and DuPont Tyvek®, or the equivalent, as protective materials for clothing.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- Wear eye protection with side shields or goggles.
- Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- Where the potential exists for exposure over **0.5 mg/m^3**, use a NIOSH approved air-purifying, particulate filter respirator with an N100 filter. More protection is provided by a full facepiece respirator than by a half-mask respirator, and even greater protection is provided by a powered-air purifying respirator.
- Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Cyclonite**, (2) while wearing particulate filters abnormal resistance to breathing is experienced, or (3) eye irritation occurs while wearing a full facepiece respirator. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter or cartridge. If the seal is no longer good, you may need a new respirator.
- Consider all potential sources of exposure in your workplace. You may need a combination of filters, prefilters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- Where the potential exists for exposure over **5 mg/m^3**, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- **Cyclonite** is an EXPLOSIVE.
- Evacuate and let the fire burn or use large amounts of water from a sheltered position.
- POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides*.
- Use water spray to keep fire-exposed containers cool.
- **Cyclonite** may ignite combustibles (wood, paper and oil).

Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **Cyclonite** is spilled, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all sources of ignition and prevent friction and shock.
- Clean up spill using qualified specialists only.
- DO NOT wash into sewer.
- Keep **Cyclonite** out of confined spaces, such as sewers, because of the possibility of an explosion.
- It may be necessary to contain and dispose of **Cyclonite** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **Cyclonite** you should be trained on its proper handling and storage.

- **Cyclonite** detonates on contact with MERCURY FULMINATE. Detonation can also be initiated by SUDDEN SHOCK, HIGH TEMPERATURE and/or FRICTION.
- **Cyclonite** reacts violently with COMBUSTIBLES; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); and REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES).
- Store in tightly closed containers in a cool, well-ventilated area away from HEAT (decomposes above 212°F (100°C)) and other EXPLOSIVES.
- Sources of ignition, such as smoking and open flames, are prohibited where **Cyclonite** is used, handled, or stored.
- Use explosion-proof electrical equipment and fittings wherever **Cyclonite** is used, handled, manufactured, or stored.
- Metal containers involving the transfer of **Cyclonite** should be grounded and bonded.
- Use only non-sparking tools and equipment, especially when opening and closing containers of **Cyclonite**.

Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.state.nj.us
Web address: http://www.nj.gov/health/eoh/rtkweb

GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Acute Exposure Guideline Levels (AEGLs) are established by the EPA. They describe the risk to humans resulting from once-in-a lifetime, or rare, exposure to airborne chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

ERG is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

Emergency Response Planning Guideline (ERPG) values are intended to provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database maintained by federal EPA. The database contains information on human health effects that may result from exposure to various chemicals in the environment.

LEL or **Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

PIH is a DOT designation for chemicals which are Poison Inhalation Hazards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Hydrogen*), at the same temperature and pressure.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

NJ Health
New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **CYCLONITE**

Synonyms: Hexogen; RDX
CAS No: 121-82-4
Molecular Formula: $C_3H_6N_6O_6$
RTK Substance No: 0579
Description: White, crystalline powder

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
2 - Health *** - Fire** *** - Reactivity** **DOT#:** UN 0483 **ERG Guide #:** 112 **Hazard Class:** 1.1 (Explosive)	* EXPLOSIVE Evacuate and let the fire burn or use large amounts of water from a sheltered position. POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides*. Use water spray to keep fire-exposed containers cool. **Cyclonite** may ignite combustibles (wood, paper and oil).	**Cyclonite** detonates on contact with MERCURY FULMINATE. Detonation can also be initiated by SUDDEN SHOCK, HIGH TEMPERATURE and/or FRICTION. **Cyclonite** reacts violently with COMBUSTIBLES; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); and REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES).

SPILL/LEAKS

Isolation Distance:

Small Spill: 500 meters (1/3 mile)

Large Spill: 800 meters (1/2 mile)

Fire: 1,600 meters (1 mile)

Use a cleanup specialist .

Keep **Cyclonite** out of confined spaces, such as sewers, because of the possibility of an explosion.

DO NOT wash into sewer.

This substance is harmful to aquatic organisms.

PHYSICAL PROPERTIES

Odor Threshold:	None
Flash Point:	Explodes
Exothermic Decomp:	212°F (100°C)
Vapor Pressure:	4.1×10^{-9} mm Hg at 68°F (20°C)
Specific Gravity:	1.82 (water = 1)
Water Solubility:	Insoluble
Boiling Point:	528° to 536°F (276° to 280°C)
Melting Point:	402°F (206°C)
Molecular Weight:	222.2

EXPOSURE LIMITS

OSHA:	None
NIOSH:	1.5 mg/m^3, 10-hr TWA; 3 mg/m^3, 15-min STEL
ACGIH:	0.5 mg/m^3, 8-hr TWA
IDLH:	None

PROTECTIVE EQUIPMENT

Gloves:	Neoprene
Coveralls:	DuPont Tyvek®
Respirator:	<0.5 mg/m^3 - Full facepiece APR with High efficiency filter >0.5 mg/m^3 - Supplied air

HEALTH EFFECTS

Eyes:	Irritation
Skin:	Irritation, rash or burning feeling
Inhalation:	Nose and throat irritation
	Headache, nausea, vomiting, weakness, confusion and seizures
Chronic:	Cancer (liver) in animals

FIRST AID AND DECONTAMINATION

Remove the person from exposure.

Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn.

Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Begin artificial respiration if breathing has stopped and CPR if necessary.

Transfer promptly to a medical facility.

New Jersey Department of Health and Senior Services

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **ISOBUTYLENE**

CAS Number: 115-11-7
DOT Number: UN 1055
UN 1075

RTK Substance number 1045
Date: May 1999

HAZARD SUMMARY

* **Isobutylene** can affect you when breathed in.
* Exposure to **Isobutylene** can irritate the eyes, nose, and throat.
* Contact with the liquid can cause frostbite.
* **Isobutylene** can cause headache, dizziness, lightheadedness and fatigue. Higher levels can cause coma and death.
* **Isobutylene** is a HIGHLY FLAMMABLE GAS and a DANGEROUS FIRE HAZARD.

IDENTIFICATION

Isobutylene is a colorless gas, or a liquid under pressure, with a sweet, gasoline odor. It is used in the production of aviation gasoline, resins, other chemicals, and antioxidants for food, packaging, and plastics.

REASON FOR CITATION

* **Isobutylene** is on the Hazardous Substance List because it is cited by DOT and NFPA.
* This chemical is on the Special Health Hazard Substance List because it is **FLAMMABLE**.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.1020.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

No occupational exposure limits have been established for **Isobutylene**. This does not mean that this substance is not harmful. Safe work practices should always be followed.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to **Isobutylene**.
* On skin contact with liquified **Isobutylene**, immediately submerse the affected body part in warm water.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Isobutylene** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Isobutylene**:

* Exposure to **Isobutylene** can irritate the eyes, nose, and throat.
* Contact with the liquid can cause frostbite.
* **Isobutylene** can cause headache, dizziness, lightheadedness and fatigue. Higher levels can cause coma and death.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Isobutylene** and can last for months or years:

Cancer Hazard

* According to the information presently available to the New Jersey Department of Health and Senior Services, **Isobutylene** has not been tested for its ability to cause cancer in animals.

Reproductive Hazard

* According to the information presently available to the New Jersey Department of Health and Senior Services, **Isobutylene** has not been tested for its ability to affect reproduction.

Other Long-Term Effects

* **Isobutylene** has not been tested for other chronic (long-term) health effects.

MEDICAL

Medical Testing

There is no special test for this chemical. However, if illness occurs or overexposure is suspected, medical attention is recommended.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.1020.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Where possible, automatically transfer **Isobutylene** from cylinders or other storage containers to process containers.
* Before entering a confined space where **Isobutylene** may be present, check to make sure that an explosive concentration does not exist.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by **Isobutylene** should change into clean clothing promptly.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to **Isobutylene.**
* Eye wash fountains should be provided in the immediate work area for emergency use.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* On skin contact with **Isobutylene**, immediately wash or shower to remove the chemical.
* Do not eat, smoke, or drink where **Isobutylene** is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating, drinking, smoking, or using the toilet.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with **Isobutylene**. Wear protective gloves and clothing. Safety equipment suppliers/ manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* Where exposure to cold equipment, vapors, or liquid may occur, employees should be provided with special clothing designed to prevent the freezing of body tissues.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

* Wear non-vented, impact resistant goggles when working with fumes, gases, or vapors.
* Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* Where the potential for overexposure exists, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

HANDLING AND STORAGE

* Prior to working with **Isobutylene** you should be trained on its proper handling and storage.
* **Isobutylene** must be stored to avoid contact with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); HYDROGEN BROMIDE; NITROGEN OXIDES; and HYDROCHLORIC ACID since violent reactions occur.
* Sources of ignition, such as smoking and open flames, are prohibited where **Isobutylene** is handled, used, or stored.
* Metal containers involving the transfer of **Isobutylene** should be grounded and bonded.
* Use only non-sparking tools and equipment, especially when opening and closing containers of **Isobutylene**.
* Store in tightly closed containers in a cool, well-ventilated area.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. This may be a problem for children or people who are already ill.

The following information is available from:

New Jersey Department of Health and Senior Services
Occupational Health Service
PO Box 360
Trenton, NJ 08625-0360
(609) 984-1863
(609) 292-5677 (fax)

Web address: http://www.state.nj.us/health/eoh/odisweb/

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call personnel at the Department of Health and Senior Services, Occupational Health Service, who can help you find the information you need.

Public Presentations
Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the Public Employees Occupational Safety and Health Act, a state law which sets PELs for New Jersey public employees.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

>>>>>>>>>>>>>>>>>>EMERGENCY INFORMATION<<<<<<<<<<<<<<<<<

Common Name: **ISOBUTYLENE**
DOT Number: **UN 1055**
NAERG Code: **155**
CAS Number: **115-11-7**

Hazard rating	NJDHSS	NFPA
FLAMMABILITY	-	4
REACTIVITY	-	0
FLAMMABLE POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* **Isobutylene** is a FLAMMABLE GAS.
* Stop flow of gas before attempting to extinguish fire.
* POISONOUS GASES ARE PRODUCED IN FIRE.
* CONTAINERS MAY EXPLODE IN FIRE.
* Use water spray to keep fire-exposed containers cool.
* Vapors may travel to a source of ignition and flash back.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If gaseous or liquid **Isobutylene** is spilled or leaked, take the following steps:

* Evacuate persons not wearing protective equipment from area of leak until clean-up is complete.
* Remove all ignition sources.
* Ventilate area of leak to disperse the gas and allow liquid to evaporate.
* Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to empty.
* It may be necessary to contain and dispose of **Isobutylene** as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
* If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

==========

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: (609) 292-7172

==========

HANDLING AND STORAGE (See page 3)

FIRST AID

In NJ, POISON INFORMATION 1-800-764-7661

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact

* Immerse affected part in warm water. Seek medical attention.
* If burning and pain persist seek medical attention immediately.

Breathing

* Remove the person from exposure.
* Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.

PHYSICAL DATA

Vapor Pressure: 2,308 mm Hg at 77°F (25°C)
Water Solubility: Insoluble

OTHER COMMONLY USED NAMES

Chemical Name:

1-Propene, 2-Methyl-

Other Names:

1,1-Dimethylethylene; 2-Methylpropylene; Isobutene

NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES
Right to Know Program
PO Box 368, Trenton, NJ 08625-0368
(609) 984-2202

Right to Know
Hazardous Substance Fact Sheet

Common Name: **2,4,6-TRINITROTOLUENE**

Synonyms: 1-Methyl-2,4,6-Trinitrobenzene; TNT

Chemical Name: Benzene, 2-Methyl-1,3,5-Trinitro-

Date: May 2000 Revision: September 2010

CAS Number: 118-96-7

RTK Substance Number: 1948

DOT Number: UN 0209

EMERGENCY RESPONDERS <<<SEE LAST PAGE

Description and Use

2,4,6-Trinitrotoluene is an odorless, colorless to pale yellow, crystalline (sand-like) solid that is often transported in a slurry. It is used primarily as an explosive and is also used in making dye stuffs and photographic chemicals.

Hazard Summary

Hazard Rating	NJDOH	NFPA
HEALTH	2	-
FLAMMABILITY	4	-
REACTIVITY	4	-
CARCINOGEN EXPLOSIVE - KEEP WET FLAMMABLE AND REACTIVE POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

Reasons for Citation

- **2,4,6-Trinitrotoluene** is on the Right to Know Hazardous Substance List because it is cited by OSHA, ACGIH, DOT, NIOSH, IARC and IRIS.
- This chemical is on the Special Health Hazard Substance List.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

- Immediately flush with large amounts of water for at least 15 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact

- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Inhalation

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

- **2,4,6-Trinitrotoluene** can affect you when inhaled and may be absorbed through the skin.
- **2,4,6-Trinitrotoluene** should be handled as a CARCINOGEN--WITH EXTREME CAUTION.
- **2,4,6-Trinitrotoluene** may cause reproductive damage. HANDLE WITH EXTREME CAUTION.
- Contact can irritate the skin and eyes and may cause a skin allergy.
- Inhaling **2,4,6-Trinitrotoluene** can irritate the nose and throat.
- High levels of this substance can reduce the blood's ability to transport *Oxygen* causing headache, fatigue, dizziness, and a blue color to the skin and lips (*methemoglobinemia*).
- Exposure to **2,4,6-Trinitrotoluene** can cause nausea and vomiting, weakness, drowsiness, tremors and seizures.
- **2,4,6-Trinitrotoluene** may damage the liver and the nervous system.
- Repeated exposure to **2,4,6-Trinitrotoluene** can damage the red blood cells causing anemia.
- High or repeated exposure can cause clouding of the eye lens (cataracts), which may damage vision.
- **2,4,6-Trinitrotoluene** is an EXPLOSIVE that can be detonated by SHOCK, FRICTION, IMPACT or HEAT.
- **2,4,6-Trinitrotoluene** is FLAMMABLE and REACTIVE and a DANGEROUS FIRE and EXPLOSION HAZARD.

Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit (PEL) is **1.5 mg/m^3** averaged over an 8-hour workshift.

NIOSH: The recommended airborne exposure limit (REL) is **0.5 mg/m^3** averaged over a 10-hour workshift.

ACGIH: The threshold limit value (TLV) is **0.1 mg/m^3** averaged over an 8-hour workshift.

- **2,4,6-Trinitrotoluene** may be a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

Determining Your Exposure

- Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility's RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act and the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to **2,4,6-Trinitrotoluene**:

- Contact can irritate the skin and eyes.
- Inhaling **2,4,6-Trinitrotoluene** can irritate the nose and throat causing coughing and wheezing.
- High levels of this substance can reduce the blood's ability to transport *Oxygen,* causing headache, fatigue, dizziness, and a blue color to the skin and lips (*methemoglobinemia*). Exposure to very high levels can cause trouble breathing, collapse and even death.
- Exposure to **2,4,6-Trinitrotoluene** can cause nausea and vomiting, weakness, drowsiness, tremors and seizures.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to **2,4,6-Trinitrotoluene** and can last for months or years:

Cancer Hazard
- **2,4,6-Trinitrotoluene** may be a CARCINOGEN in humans since it has been shown to cause bladder cancer in animals.
- Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard
- **2,4,6-Trinitrotoluene** may damage the testes (male reproductive glands).

Other Effects
- **2,4,6-Trinitrotoluene** may cause a skin allergy. If allergy develops, very low future exposure can cause itching and a skin rash.
- **2,4,6-Trinitrotoluene** may damage the liver.
- **2,4,6-Trinitrotoluene** may damage the nervous system causing numbness, "pins and needles," and/or weakness in the hands and feet.
- Repeated exposure to **2,4,6-Trinitrotoluene** can damage the red blood cells causing anemia.
- High or repeated exposure can cause clouding of the eye lens (cataracts), which may damage vision.

Medical

Medical Testing
For frequent or potentially high exposure (half the TLV or greater), the following are recommended before beginning work and at regular times after that:

- Complete blood count
- Liver function tests

If symptoms develop or overexposure is suspected, the following are recommended:

- Blood methemoglobin level
- Evaluation by a qualified allergist can help diagnose skin allergy.
- Exam of the eyes and vision
- Exam of the nervous system

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Mixed Exposures
- More than light alcohol consumption can cause liver damage. Drinking alcohol can increase the liver damage caused by **2,4,6-Trinitrotoluene**.

Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- Before entering a confined space where **2,4,6-Trinitrotoluene** may be present, check to make sure that an explosive concentration does not exist.
- Use a wet method to reduce dust during clean-up. DO NOT DRY SWEEP as friction may cause detonation.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

- Avoid skin contact with **2,4,6-Trinitrotoluene**. Wear personal protective equipment made from material which can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.
- The recommended glove material for **2,4,6-Trinitrotoluene** is Butyl.
- The recommended protective clothing material for *wetted* **2,4,6-Trinitrotoluene** is Tychem® CSM, or the equivalent.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- For impact hazards (such as flying fragments, chips or particles), wear safety glasses with side shields or safety goggles.
- If additional protection is needed for the entire face, use in combination with a face shield. A face shield should not be used without another type of eye protection.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- Where the potential exists for exposure over **0.1 mg/m^3**, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus or an emergency escape air cylinder.
- Exposure to **500 mg/m^3** is immediately dangerous to life and health. If the possibility of exposure above **500 mg/m^3** exists, use a NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode equipped with an emergency escape air cylinder.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- **2,4,6-Trinitrotoluene** is an EXPLOSIVE that can be detonated by HEAT, LIGHT, FRICTION or SHOCK.
- **2,4,6-Trinitrotoluene** is a FLAMMABLE and REACTIVE SOLID.
- Use water or dirt for small fires. DO NOT attempt to extinguish large fires.
- POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides*.
- CONTAINERS MAY EXPLODE IN FIRE.
- Use water spray to keep fire-exposed containers cool.

Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **2,4,6-Trinitrotoluene** is spilled or leaked, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- DO NOT CLEAN-UP or DISPOSE of unless supervised by a specialist in explosives.
- KEEP SPILLED **2,4,6-Trinitrotoluene** WET!
- DO NOT SWEEP UP DRY MATERIAL.
- Keep **2,4,6-Trinitrotoluene** out of confined spaces, such as sewers, because of the possibility of an explosion.
- Ventilate and wash area after clean-up is complete.
- DO NOT wash into sewer.
- It may be necessary to contain and dispose of **2,4,6-Trinitrotoluene** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **2,4,6-Trinitrotoluene** you should be trained on its proper handling and storage.

- **2,4,6-Trinitrotoluene**, especially *hot liquid* **2,4,6-Trinitrotoluene**, may explosively decompose with SHOCK, FRICTION, IMPACT or HEAT (above 464°F (240°C)).
- **2,4,6-Trinitrotoluene** reacts violently or explosively with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); AMMONIA; REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES); STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); NITRIDES; NITRIC ACID; LEAD; IRON; and ORGANIC SOLVENTS.
- Store in tightly closed containers in a cool, well-ventilated area away from COMBUSTIBLES and protect from PHYSICAL DAMAGE.
- Sources of ignition, such as smoking and open flames, are prohibited where **2,4,6-Trinitrotoluene** is used, handled, or stored.
- Metal containers involving the transfer of **2,4,6-Trinitrotoluene** should be grounded and bonded.
- Use explosion-proof electrical equipment and fittings wherever **2,4,6-Trinitrotoluene** is used, handled, manufactured, or stored.
- Use only non-sparking tools and equipment, especially when opening and closing containers of **2,4,6-Trinitrotoluene**.

Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.state.nj.us
Web address: http://www.nj.gov/health/eoh/rtkweb

GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Acute Exposure Guideline Levels (AEGLs) are established by the EPA. They describe the risk to humans resulting from once-in-a lifetime, or rare, exposure to airborne chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

The **critical temperature** is the temperature above which a gas cannot be liquefied, regardless of the pressure applied.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

ERG is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

Emergency Response Planning Guideline (ERPG) values provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database on human health effects that may result from exposure to various chemicals, maintained by federal EPA.

LEL or **Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

Protective Action Criteria (PAC) are values established by the Department of Energy and are based on AEGLs and ERPGs. They are used for emergency planning of chemical release events.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Air*), at the same temperature and pressure.

The **vapor pressure** is a force exerted by the vapor in equilibrium with the solid or liquid phase of the same substance. The higher the vapor pressure the higher concentration of the substance in air.

NJ Health New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **2,4,6-TRINITROTOLUENE**

Synonyms: 1-Methyl-2,4,6-Trinitrobenzene; TNT
CAS No: 118-96-7
Molecular Formula: $C_7H_5N_3O_6$
RTK Substance No: 1948
Description: Odorless, colorless to pale yellow, crystalline solid that may be transported in a slurry

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
2 - Health **4 - Fire** **4 - Reactivity** **DOT#:** UN 0209 **ERG Guide #:** 112 **Hazard Class:** 1 (Explosive)	**2,4,6-Trinitrotoluene** is an EXPLOSIVE that can be detonated by HEAT, LIGHT, FRICTION or SHOCK. **2,4,6-Trinitrotoluene** is a FLAMMABLE and REACTIVE SOLID. Use water or dirt for small fires. DO NOT attempt to extinguish large fires. POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides*. CONTAINERS MAY EXPLODE IN FIRE. Use water spray to keep fire-exposed containers cool.	**2,4,6-Trinitrotoluene**, especially *hot liquid* **2,4,6-Trinitrotoluene** may explosively decompose with SHOCK, FRICTION, IMPACT or HEAT (above 464°F (240°C)). **2,4,6-Trinitrotoluene** reacts violently or explosively with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); AMMONIA; REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES); STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); NITRIDES; NITRIC ACID; LEAD; IRON; and ORGANIC SOLVENTS.

SPILL/LEAKS

Isolation Distance:

Spill: 500 meters (1/2 mile)

Fire: 1,600 meters (1 mile)

DO NOT CLEAN-UP or DISPOSE of unless supervised by a specialist in explosives.

Keep spilled **2,4,6-Trinitrotoluene** WET!

Use only non-sparking tools and equipment, especially when opening and closing containers of **2,4,6-Trinitrotoluene**.

Metal containers involving the transfer of **2,4,6-Trinitrotoluene** should be grounded and bonded.

DO NOT wash into sewer.

DO NOT OPERATE RADIO TRANSMITTORS within 100 meters (330 feet) of ELECTRICAL DETONATORS.

2,4,6-Trinitrotoluene is toxic to aquatic organisms and may cause long-term effects.

PHYSICAL PROPERTIES

Odor Threshold:	Odorless
Flash Point:	Flammable Solid (Explodes)
Auto Ignition Temp:	887°F (474°C)
Vapor Pressure:	0.0002 mm Hg at 68°F (20°C)
Specific Gravity:	1.65 (water = 1)
Water Solubility:	Very slightly soluble
Boiling Point:	464°F (240°C) (Explodes)
Melting Point:	176°F (80°C)
Ionization Potential:	10.59 eV
Molecular Weight:	227.15

EXPOSURE LIMITS

OSHA: 1.5 mg/m^3, 8-hr TWA
NIOSH: 0.5 mg/m^3, 10-hr TWA
ACGIH: 0.1 mg/m^3, 8-hr TWA
IDLH: 500 mg/m^3

The Protective Action Criteria values are:
PAC-1 =1.25 mg/m^3 PAC-2 = 7.5 mg/m^3
PAC-3 = 500 mg/m^3

PROTECTIVE EQUIPMENT

Gloves: Butyl (>8-hr breakthrough for *liquid Nitro compounds*)

Coveralls: Tychem® CSM (>2-hr breakthrough for *liquid Nitro compounds*)
Flash protection or Turn-Out gear

Respirator: SCBA

HEALTH EFFECTS

Eyes: Irritation

Skin: Irritation

Inhalation: Nose and throat irritation with coughing and wheezing
Headache, fatigue and blue color to the skin and lips (methemoglobinemia)

Chronic: Cancer (bladder) in animals

FIRST AID AND DECONTAMINATION

Remove the person from exposure.

Flush eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn.

Quickly remove contaminated clothing and wash contaminated skin with large amounts of soap and water.

Begin artificial respiration if breathing has stopped and CPR if necessary.

Transfer promptly to a medical facility.

Appendix B

Resumes

(Current field personnel resumes are kept on site)

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Appendix C

Training Certificates

(Current field personnel training certificates are kept on site)

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Appendix D
Communication Information

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1359-A Ellsworth Industrial Boulevard ■ Atlanta, GA 30318 ■ Telephone (404) 636-0928 ■ FAX (404) 636-7162 ■ http://www.kemron.com

Conversation Memorandum

Project: Former Fort Ord Accident Prevention Plan

Project Number: SH4914-103-15

Date: 11/20/2014

Employee: Daniel Robinson

Conversation Summary:

Santa Clara Valley Medical Center Trauma/ Burn Facilities (408) 855-5000:

I called to confirm that this facility had emergency capabilities and services necessary for the Munitions and Explosives of Concern Removal and Soil Investigation project at Fort Ord. I spoke to an administrative representative working the main switchboard for incoming calls. She stated that this hospital is a trauma center for the area and could provide the appropriate off-site medical services for this project. However, she stated that this facility is about 1.5 hours away from Fort Ord, and that a closer hospital (non-trauma) is likely available as well. She also provided a direct contact number for the emergency room, which is 408-885-6900.

Community Hospital of the Monterey Peninsula (831) 625-4900

I called to confirm that this facility had emergency capabilities and services necessary for the Munitions and Explosives of Concern Removal and Soil Investigation project at Fort Ord. I spoke to an administrative representative, who stated that the 831-625-4900 phone number directly connected to the emergency department and is the contact number to use in case of an emergency. She confirmed that the facility can provide the appropriate off-site medical services for this project.

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Appendix E

Hazard Communication Materials

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HAZARD COMMUNICATION (HAZCOM)

Attachment 3-2

Chemical Labels – NFPA

OSHA Standard 1910.1200

Every person who works with or around chemicals must understand the Labeling System

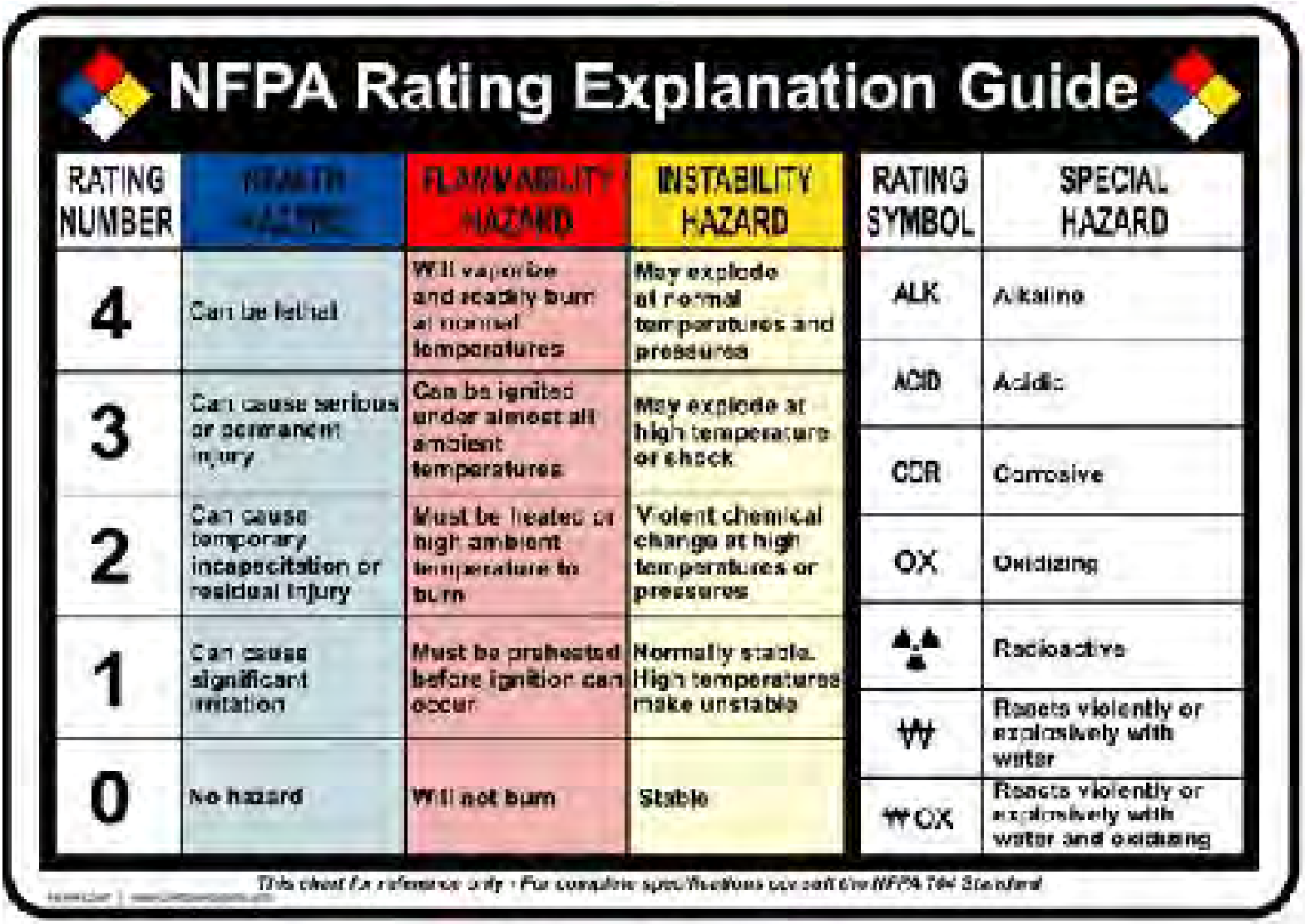
Hazards - four basic hazard classifications for chemicals

> **Health Hazards** are those that can affect the immediate or long term health of an employee if exposed to a specific chemical. Acute effects of exposure are those that present symptoms when exposure occurs, such as when skin is exposed to an acid. Delayed or long term health effects can also occur from chemical exposure, such as cancer. Health effects for any given chemical will depend on the toxicity, duration of exposure and amount of exposure.
>
> **Fire Hazard** ratings range from *non-flammable* to *highly flammable.* The NFPA ratings are based on the material flashpoint—the temperature at which the chemical *vapors* will ignite.
>
> **Reactivity** ratings describe the hazards of the material stability - some chemicals will explode or react violently if exposed to heat or shock
>
> **Other Hazards** - special markings are required if the material is radioactive, an oxidizer, acid or base or will react when exposed to other materials.

Hazard Controls include:

- Labeling of all chemicals
- Proper chemical storage containers & areas
- Segregation of incompatible chemicals
- Personal Protective Equipment
- Use of chemicals by training and authorized employees
- Use of minimum amount necessary
- Bonding & Grounding of flammable liquid containers

HAZARD COMMUNICATION (HAZCOM)



NFPA Rating Explanation Guide

RATING NUMBER	HEALTH HAZARD	FLAMMABILITY HAZARD	INSTABILITY HAZARD
4	Can be lethal	Will vaporize and readily burn at normal temperatures	May explode at normal temperatures and pressures
3	Can cause serious or permanent injury	Can be ignited under almost all ambient temperatures	May explode at high temperature or shock
2	Can cause temporary incapacitation or residual injury	Must be heated or high ambient temperature to burn	Violent chemical change at high temperatures or pressures
1	Can cause significant irritation	Must be preheated before ignition can occur	Normally stable. High temperatures make unstable
0	No hazard	Will not burn	Stable

RATING SYMBOL	SPECIAL HAZARD
ALK	Alkaline
ACID	Acidic
COR	Corrosive
OX	Oxidizing
	Radioactive
W	Reacts violently or explosively with water
W OX	Reacts violently or explosively with water and oxidizing

This chart for reference only - For complete specifications see current NFPA 704 Standard

HAZARDOUS CHEMICAL INVENTORY FORM

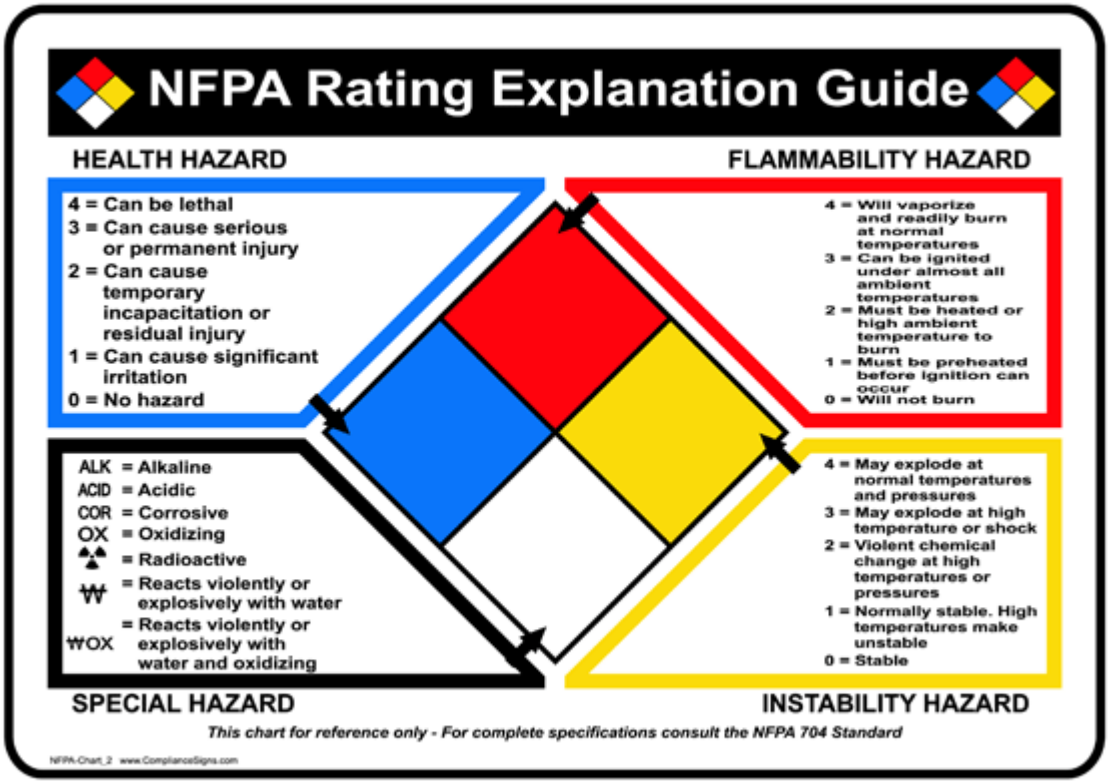
SDS #	LOCATION	PRODUCT NAME	HAZARDOUS CHEMICALS	MANUFACTURER	DATE OF SDS

NFPA Rating Explanation Guide

RATING NUMBER	HEALTH HAZARD	FLAMMABILITY HAZARD	INSTABILITY HAZARD
4	Can be lethal	Will vaporize and readily burn at normal temperatures	May explode at normal temperatures and pressures
3	Can cause serious or permanent injury	Can be ignited under almost all ambient temperatures	May explode at high temperature or shock
2	Can cause temporary incapacitation or residual injury	Must be heated or high ambient temperature to burn	Violent chemical change at high temperatures or pressures
1	Can cause significant irritation	Must be preheated before ignition can occur	Normally stable. High temperatures make unstable
0	No hazard	Will not burn	Stable

RATING SYMBOL	SPECIAL HAZARD
ALK	Alkaline
ACID	Acidic
COR	Corrosive
OX	Oxidizing
☢	Radioactive
W	Reacts violently or explosively with water
W OX	Reacts violently or explosively with water and oxidizing

This chart for reference only - For complete specifications consult the NFPA 704 Standard


NFPA Rating Explanation Guide
HEALTH HAZARD
4 = Can be lethal
3 = Can cause serious or permanent injury
2 = Can cause temporary incapacitation or residual injury
1 = Can cause significant irritation
0 = No hazard
FLAMMABILITY HAZARD
4 = Will vaporize and readily burn at normal temperatures
3 = Can be ignited under almost all ambient temperatures
2 = Must be heated or high ambient temperature to burn
1 = Must be preheated before ignition can occur
0 = Will not burn
ALK = Alkaline
ACID = Acidic
COR = Corrosive
OX = Oxidizing
= Radioactive
= Reacts violently or explosively with water
= Reacts violently or explosively with water and oxidizing
SPECIAL HAZARD
4 = May explode at normal temperatures and pressures
3 = May explode at high temperature or shock
2 = Violent chemical change at high temperatures or pressures
1 = Normally stable. High temperatures make unstable
0 = Stable
INSTABILITY HAZARD
This chart for reference only - For complete specifications consult the NFPA 704 Standard

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Appendix F
Excavation and Trenching Materials

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TRENCHING AND EXCAVATING

Attachment 29-1

Trenching and Excavation Checklist		
Work Location:		Date:
Task Description:		
Competent Person (CP):		
Soil Class:	Excavation Depth:	Width:
Type of Protective System Used:		

Type of Trenching/Excavation/Demolition	**CP Initial:**
□ Power equipment used:	
□ Manual (portable pnematic tools and equipment):	
□ Manual (shovels, spades, spikes etc.):	

Information Review	**Dist. Specialist Intial:**
□ The owner of the area to be excavated, Utilities Distribution Specialist, and/or the Facilities Engineering Group have been contacted to obtain avaliable underground drawings of all underground utilities and process (electrical, steam products, fuel, gas, etc.) lines.	
□ All relevant drawings have been reviewed	
□ Appropriate Electrical, Utility, Fire Protection, and R&D representatives have been contacted concerning the location of underground facilities that may be excluded from avaliable drawings.	

HWP/Confined Space	**CP Initial:**
□ All Hazardous Work Permit requirements have been met	
□ Requirements for Confined Space Entry have been considered and met if applicable	
□ Other (explain) :	

Soil Classification	**CP Initial:**
□ Document soil classification requirements on back. Required if > 4' deep	

Protective Systems	**CP Initial:**
Check method used if > 4' deep	
□ Appendix B - Sloping and Benching	
□ Appendix C - Timber Shoring for Trenches	
□ Appendix D - Aluminum Hydraulic Shoring for Trenches	
□ RPE Designed Shoring - Data must be poster on job site	
□ N/A	

TRENCHING AND EXCAVATING

Attachment 29-1

If assitance is needed to determine proper protective sustem, refer to Appendix E "Alternatives to Timber Shoring" or Appendix F "Selection of Protective Systems."

Excavation Inspection(s) **CP Initial:**

- □ Daily inspections required
- □ Additional inspections required (water in excavation, rain, seeping water or other hazardous conditions)

Other **CP Initial:**

- □ All employees have been informed of the potential hazards associated with the job and the measures they are to take to protect themselves and the facilities.
- □ Job procedures have been discussed with all employees assigned to the job.
- □ Necessary ppreparations have been made to ground pnematic tools
- □ Hazardous underground energy sources (e.g., electricity, flammable gases) HAVE BEEN de-energized/isolated
- □ Additional Considerations/Recommendations:

General Inspection of Jobsite	YES	NO
Are excavations, adjacent aareas, and protective systems inspected by a competent person daily before the start of work?		
Competent person has the authority to remove employees from the excavation immediately		
Have surface encumbrances removed or supported?		
Are employees protecte from loose rock or soil that could pose a hazard by falling or solling into the excavation?		
Are hard hats worn by all employees?		
Are spoils, materials and equipment seet back at least two feet from the edge of the excavation?		
Are barriers provided at all remotely located excavations, wells, pits, shafts, etc.?		
Are walkways and bridges over excavations four feet or more in depth are equipped with standard guardrails and toeboards.		
Are warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic?		
Are employees required to stand away from vehicles being (un)loaded?		
Is a warning system established and utilized when mobile equipment is operating near the edge of the excavation?		
Are employees prohibited from going under suspended loads?		
Are employees prohibited from working on the faces of slopes or benched excavations above other employees?		

TRENCHING AND EXCAVATING

Attachment 29-1

Utilities	**YES**	**NO**
Have utility companies been contacted and or located?		
Is the exact location of utilities marked?		
Are underground installations protected, supported, or removed when excavation is open?		
Means of Access and Egress	**YES**	**NO**
Is lateral travel to means of egress no greater that 25 feet in excavations four feet or more in depth?		
Are ladders used in excavations secured and extended three feet above the edge of the trench?		
Are structural ramps used for equipment designed by a competent person?		
Are structural ramps used for equipment designed by a registered professional engineer?		
Are ramps constructed of materials of uniform thickness, cleated together on the bottom and equipped with no-slip surface?		
Are employees protected from cave-ins when entering or exiting the excavation?		
Wet Conditions	**YES**	**NO**
Have precautions been taken to protect employees from the accumulation of water?		
Is water removal equipment monitored by a competent person?		
Is surface water or runoff diverted or controlledto prevent accumulation in the excavation?		
Are inspections made after every rainstorm or other hazard-increasing occurrence?		
Hazardous Atmosphere	**YES**	**NO**
Has the atmosphere within the excavation been tested where there is a reasonable possibilit of an oxygen deficiency, combustible or other harmful contaminant exposing employees to a hazard?		
Are adequate precations taken to protect employees from exposure to an atmosphere containing less that 19.5% oxygen and/or to other hazardous atmospheres?		
Is ventilation provided to prevent employee exposure to an atmosphere containing flammable gas in excess of 10% of the lower explosive limit of the gas?		
Is testing conducted often to ensure that the atmosphere remains safe?		

TRENCHING AND EXCAVATING

Attachment 29-1

Hazardous Atmosphere (Continued)	**YES**	**NO**
Is emergency equipment, such as breathing apparatus, safety harness and lifeline, and/or basket stretcher readily avaliable where hazardous atmoshpheres could or do exist?		
Are employees trained to use personal protective and other rescue equipment?		
Are safety harness and lifeline used and individually attended when entering bell bottom or other deep confined excavations?		
Support Systems	**YES**	**NO**
Are materials and/or equipment for suppourt systems slected based on soil analysis, trench depth, and expected loads?		
Are naterials and equipment used for protective systems inspected and in good condition?		
Have materials and equipment in poor condition been removed from service?		
Are damaged materials sand equipment used for protective systems inspected by a registered professional engineer (RPE) after repairs and before being placed back into service?		
Are protective systems installed without exposing employees to the hazards of cave-ins, collapses, or threat of being struck by materials or equipment?		
Are members of support systems securely fastened to prevent failure?		
Are support systems provided to ensure stability of adjacent structutres, buildings, roadways, sidewalks, walls, etc?		
Are excavations below the level of the base or footing supported, approved by an RPE?		
Does removal of support systems progress from the bottom and members are released lowly as to note any indication of possible failure?		
Does backfilling progress with the removal of the support system?		
Is excavation of material to a level no greater than two feet below the bottom of the supprt system and only if the systems is designed to supprt the loads calculated for the full depth?		
Is the shield system placed to prevent lateral movement?		
Are employees prohibited from remaining in shield system during vertical movement?		

TABLE A - 1.1

TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type A $P_a = 25 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (Actual) and Spacing of Members**													
	Cross Braces							Wales		Uprights				
	Horizontal Spacing (Ft.)	Width of Trench (Ft.)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Allowable Horizontal Spacing (Ft.)				
		Upto4	Upto6	Up to 9	Up to 12	Up to 15				Close	4	5	6	8
5 to 10	Up to 6	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—				2x6	
	Up to 8	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—					2x8
	Up to 10	4x6	4x6	4x6	6x6	6x6	4	8x8	4			2x6		
	Up to 12	4x6	4x6	6x6	6x6	6x6	4	8x8	4				2x6	
10 to 15	Up to 6	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—				3x8	
	Up to 8	4x6	4x6	6x6	6x6	6x6	4	8x8	4		2x6			
	Up to 10	6x6	6x5	6x6	6x8	6x8	4	8xl0	4			2x6		
	Up to 12	6x6	6x6	6x6	6x8	6x8	4	10x10	4				3x8	
15 to 20	Up to 6	6x6	6x6	6x6	6x8	6x8	4	6x8	4	3x6				
	Up to 8	6x6	6x6	6x6	6x8	6x8	4	8x8	4	3x6				
	Up to 10	8x8	8x8	8x8	8x8	8x10	4	8x10	4	3x6				
	Up to 12	8x8	8x8	8x8	8x8	8x10	4	10x10	4	3x6				
Over 20	See NOTE 1.													

* Mixed oak or equivalent with a bending strength not less than 850 psi.

**Manufactured members of equivalent strength may be substituted for wood.

TABLE A - 1.2

TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type B $P_a = 45 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (Actual) and Spacing of Members **												
	Cross Braces						Wales		Uprights				
	Horizontal Spacing (Ft.)	Width Of Trench (Feet)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Horizontal Spacing (On Center)			
		Upto4	Up to 6	Upto9	Up to 12	Up to 15				Close	2	3	
5 to 10	Up to 6	4x6	4x6	6x6	6x6	6x6	5	6x8	5			2x6	
	Up to 8	6x6	6x6	6x6	6x8	6x8	5	8xl0	5			2x6	
	Up to 10	6x6	6x6	6x6	6x8	6x8	5	10xl0	5			2x6	
	See Note 1												
10 to 15	Up to 6	6x6	6x6	6x6	6x8	6x8	5	8x8	5		2x6		
	Up to 8	6x8	6x8	6x8	8x8	8x8	5	10xl0	5		2x6		
	Up to 10	8x8	8x8	8x8	8x8	8xl0	5	10xl2	5		2x6		
	See Note 1												
15 to 20	Up to 6	6x8	6x8	6x8	8x8	8x8	5	8xl0	5	3x6			
	Up to 8	8x8	8x8	8x8	8x8	8xl0	5	10xl2	5	3x6			
	Up to 10	8xl0	8xl0	8xl0	8xl0	10xl0	5	12xl2	5	3x6			
	See Note 1												
Over 20	See NOTE 1.												

* Mixed oak or equivalent with a bending strength not less than 850 psi.

**Manufactured members of equivalent strength may be substituted for wood.

TABLE A - 1.3
TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type C $P_a = 80 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (Actual) and Spacing of Members **													
	Cross Braces						Wales		Uprights					
	Horizontal Spacing (Ft.)	Width of Trench (Ft.)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Allowable Horiz. Spacing (Ft.)				
		Upto4	Up to 6	Up to 9	Up to 12	Up to 15				Close				
5 to 10	Up to 6	6x8	6x8	6x8	8x8	8x8	5	8x10	5	2x6				
	Up to 8	8x8	8x8	8x8	8x8	8x10	5	10x12	5	2x6				
	Up to 10	8x10	8x10	8xl0	8x10	8x10	5	12x12	5	2x6				
	See Note 1													
10 to 15	Up to 6	8x8	8x8	8x8	8x8	8x10	5	10x12	5	2x6				
	Up to 8	8x10	8x10	8x10	8x10	8x10	5	12x12	5	2x6				
	See Note 1													
	See Note 1													
15 to 20	Up to 6	8x10	8xl0	8x10	8x10	8x10	5	12x12	5	3x6				
	See Note I													
	See Note 1													
	See Note 1													
Over 20	See NOTE 1.													

*Mixed oak or equivalent with a bending strength not less than 850 psi.
**Manufactured members of equivalent strength may be substituted for wood.

TABLE A-2.1

TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type A $P_a = 25 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (S4S) and Spacing of Members**												
	Cross Braces						Wales		Uprights				
	Horizontal Spacing (Ft.)	Width Of Trench (Feet)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Horizontal Spacing (On Center)				
		Upto4	Upto6	Upto9	Up to 12	Up to 15				Close	4	5	6	8
5 to 10	Up to 6	4x4	4x4	4x4	4x4	4x6	4	Not Req'd	Not Req'd				4x6	
	Up to 8	4x4	4x4	4x4	4x6	4x6	4	Not Req'd	Not Req'd					4x8
	Up to 10	4x6	4x6	4x6	6x6	6x6	4	8x8	4			4x6		
	Up to 12	4x6	4x6	4x6	6x6	6x6	4	8x8	4				4x6	
10 to 15	Up to 6	4x4	4x4	4x4	6x6	6x6	4	Not Req'd	Not Req'd				4x10	
	Up to 8	4x6	4x6	4x6	6x6	6x6	4	6x8	4		4x6			
	Up to 10	6x6	6x6	6x6	6x6	6x6	4	8x8	4			4x8		
	Up to 12	6x6	6x6	6x6	6x6	6x6	4	8xl0	4		4x6		4x10	
15 to 20	Up to 6	6x6	6x6	6x6	6x6	6x6	4	6x8	4	3x6				
	Up to 8	6x6	6x6	6x6	6x6	6x6	4	8x8	4	3x6	4xl2			
	Up to 10	6x6	6x6	6x6	6x6	6x8	4	8xl0	4	3x6				
	Up to 12	6x6	6x6	6x6	6x8	6x8	4	8xl2	4	3x6	4xl2			
Over 20	See NOTE 1.													

*Douglas fir or equivalent with a bending strength not less than 1500 psi.

**Manufactured members of equivalent strength may be substituted for wood.

TABLE A - 2.2

TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type B P. = 45 X H + 72 psf(2 ft. surcharge)

Depth Of Trench (Feet)	Size (S4S) and Spacing of Members**													
	Cross Braces							Wales		Uprights				
	Horizontal Spacing(Ft.)	Width of Trench (Ft.)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Allowable Horiz. Spacing (Ft.)				
		Upto4	Upto6	Up to 9	Up to 12	Up to 15				Close	2	3	4	6
5 to 10	Up to 6	4x6	4x6	4x6	6x6	6x6	5	6x8	5			4x8		4xl2
	Up to 8	4x6	4x6	6x6	6x6	6x6	5	8x8	5		3x8		4x8	
	Up to 10	4x6	4x6	6x6	6x6	6x8	5	8xl0	5			4x8		
	See Note I													
10 to 15	Up to 6	6x6	6x6	6x6	6x8	6x8	5	8x8	5	3x6	4xl0			
	Up to 8	6x8	6x8	6x8	8x8	8x8	5	IOxiO	5	3x6	4xl0			
	Up to 10	6x8	6x8	8x8	8x8	8x8	5	10x12	5	3x6	4x10			
	See Note 1													
15 to 20	Up to 6	6x8	6x8	6x8	6x8	8x8	5	8xl0	5	4x6				
	Up to 8	6x8	6x8	6x8	8x8	8x8	5	10x12	5	4x6				
	Up to 10	8x8	8x8	8x8	8x8	8x8	5	12x12	5	4x6				
	See Note 1													
Over 20	See NOTE 1.													

*Douglas fir or equivalent with a bending strength not less than 1500 psi.

** Manufactured members of equivalent strength may be substituted for wood.

TABLE A -2.3
TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type C $P_a = 80 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (S4S) and Spacing of Members **													
	Cross Braces							Wales		Uprights				
	Horizontal Spacing (Ft.)	Width Of Trench (Feet)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Horizontal Spacing (On Center)				
		Upto4	Up to 6	Upto9	Up to 12	Up to 15				Close				
5 to 10	Up to 6	6x6	6x6	6x6	6x6	8x8	5	8x8	5	3x6				
	Up to 8	6x6	6x6	6x6	8x8	8x8	5	l0x10	5	3x6				
	Up to 10	6x6	6x6	8x8	8x8	8x8	5	l0x12	5	3x6				
	See Note l													
10 to 15	Up to 6	6x8	6x8	6x8	8x8	8x8	5	l0x10	5	4x6				
	Up to 8	8x8	8x8	8x8	8x8	8x8	5	12x12	5	4x6				
	See Note 1													
	See Note 1													
15 to 20	Up to 6	8x8	8x8	8x8	8xl0	8xl0	5	10x12	5	4x6				
	See Note 1													
	See Note 1													
	See Note 1													
Over 20	See NOTE 1.													

*Douglas fir or equivalent with a bending strength not less than 1500 psi.
**Manufactured members of equivalent strength may be substituted for wood.

TABLEB-1
MAXIMUM ALLOWABLE SLOPES

Soil Or Rock Type	Maximum Allowable Slopes (H:V) [1] For Excavations Less Than 20 Feet Deep [3]
Stable Rock	Vertical (90°)
Type A [2]	%:1 (53°)
TypeB	1:1 (45°)
TypeC	1 Yz:1 (34°)

Footnote (1): Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

Footnote (2): A short-term maximum allowable slope of 1!2H:1V (63 degrees) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1 V (53 degrees).

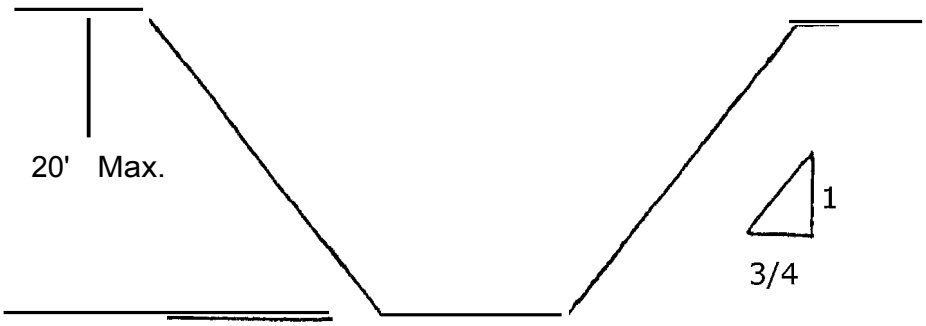
Footnote (3): Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

FIGUREB-1
SLOPE CONFIGURATIONS
(All slopes stated below are in the horizontal to vertical ratio)

B- 1.1 Excavations made in Type A soil.

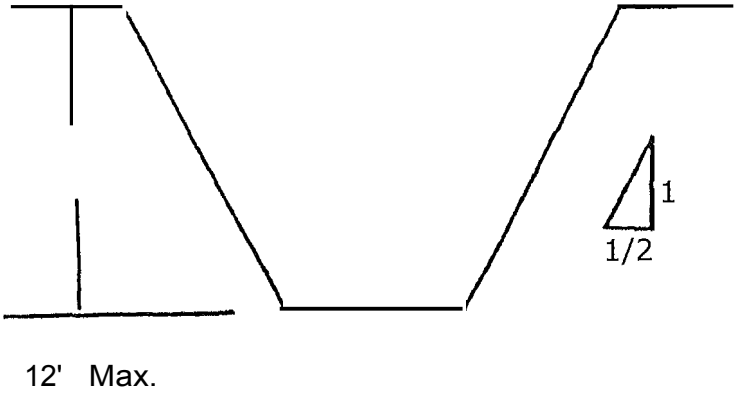
SIMPLE SLOPE - GENERAL

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



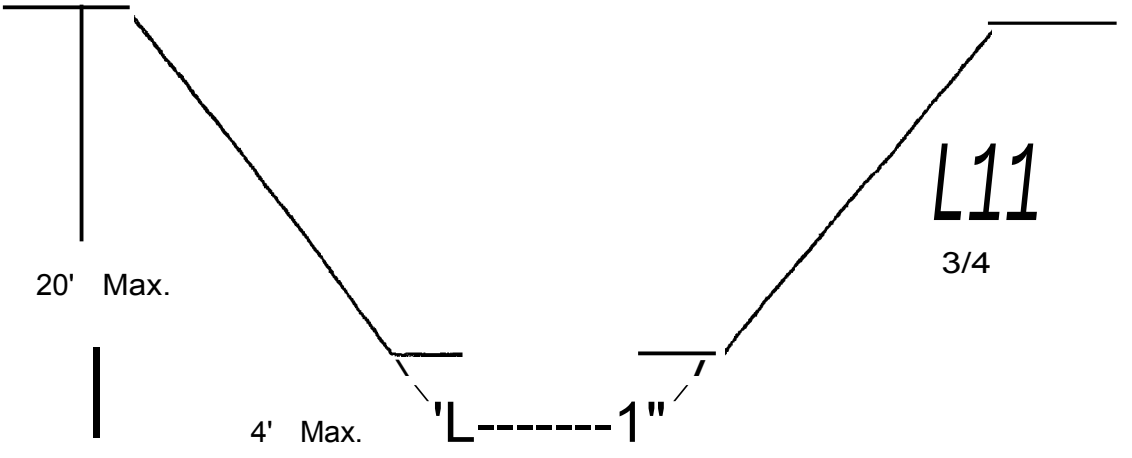
SIMPLE SLOPE - SHORT TERM

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 112:1.

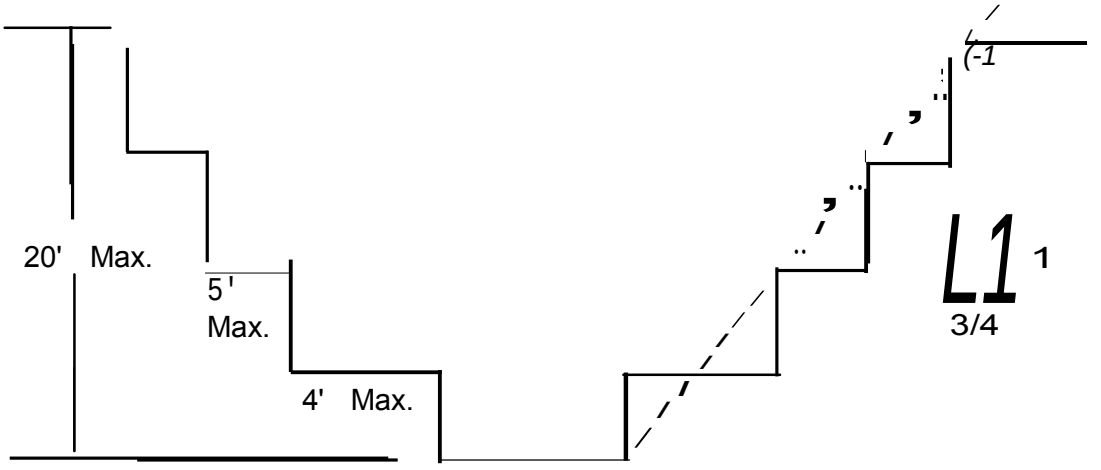


SIMPLE BENCH

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

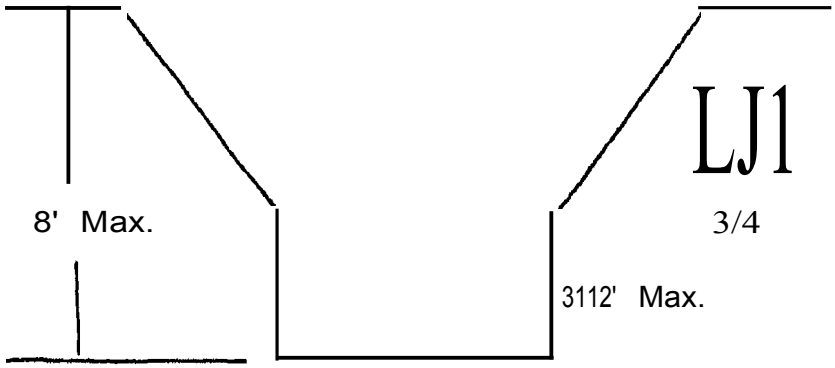


MULTIPLE BENCH



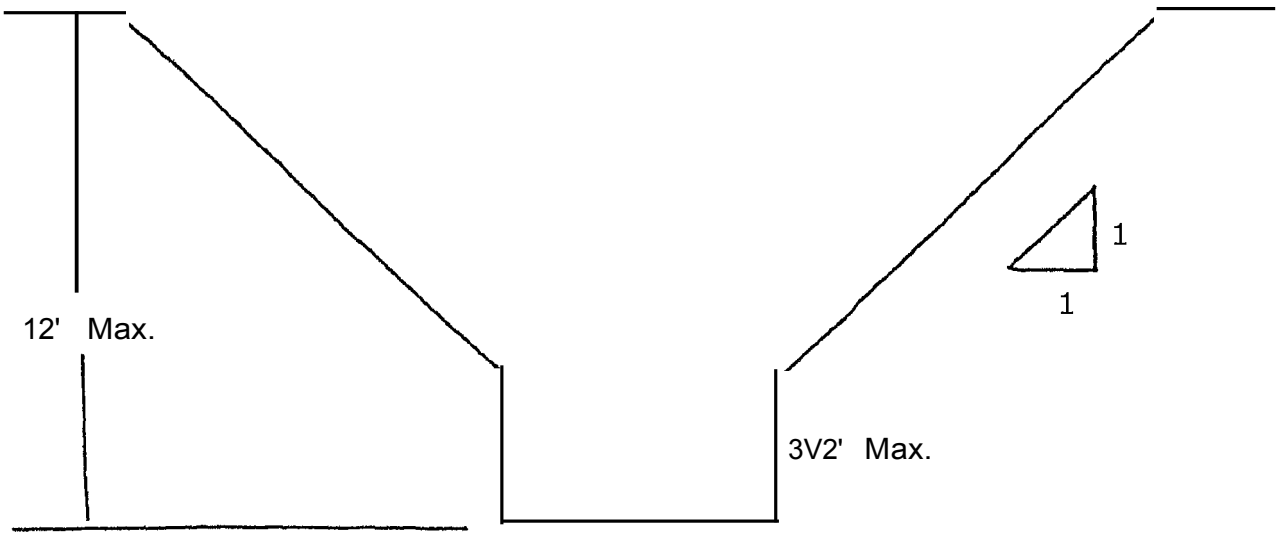
UNSUPPORTED VERTICALLY SIDED LOWER PORTION- MAXIMUM 8 FEET IN DEPTH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



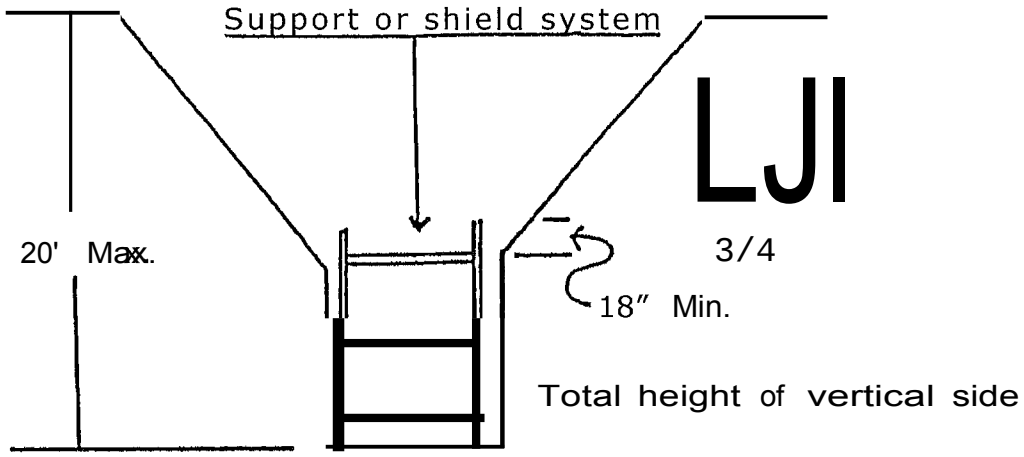
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -MAXIMUM 12 FEET IN DEPTH

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of3 1/2 feet.



SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

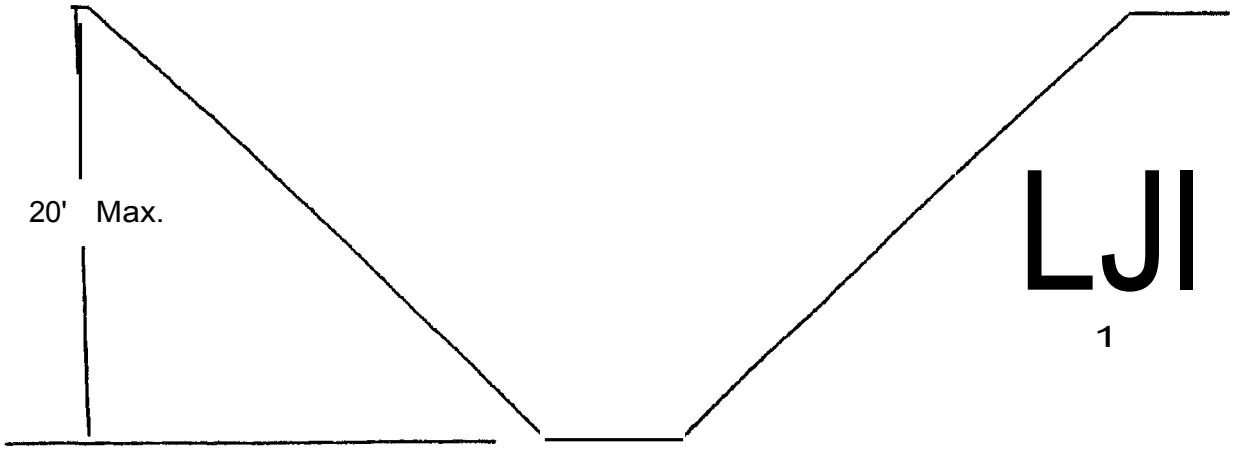


4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under 1926.652(b).

B -1.2 Excavations Made in Type B Soil

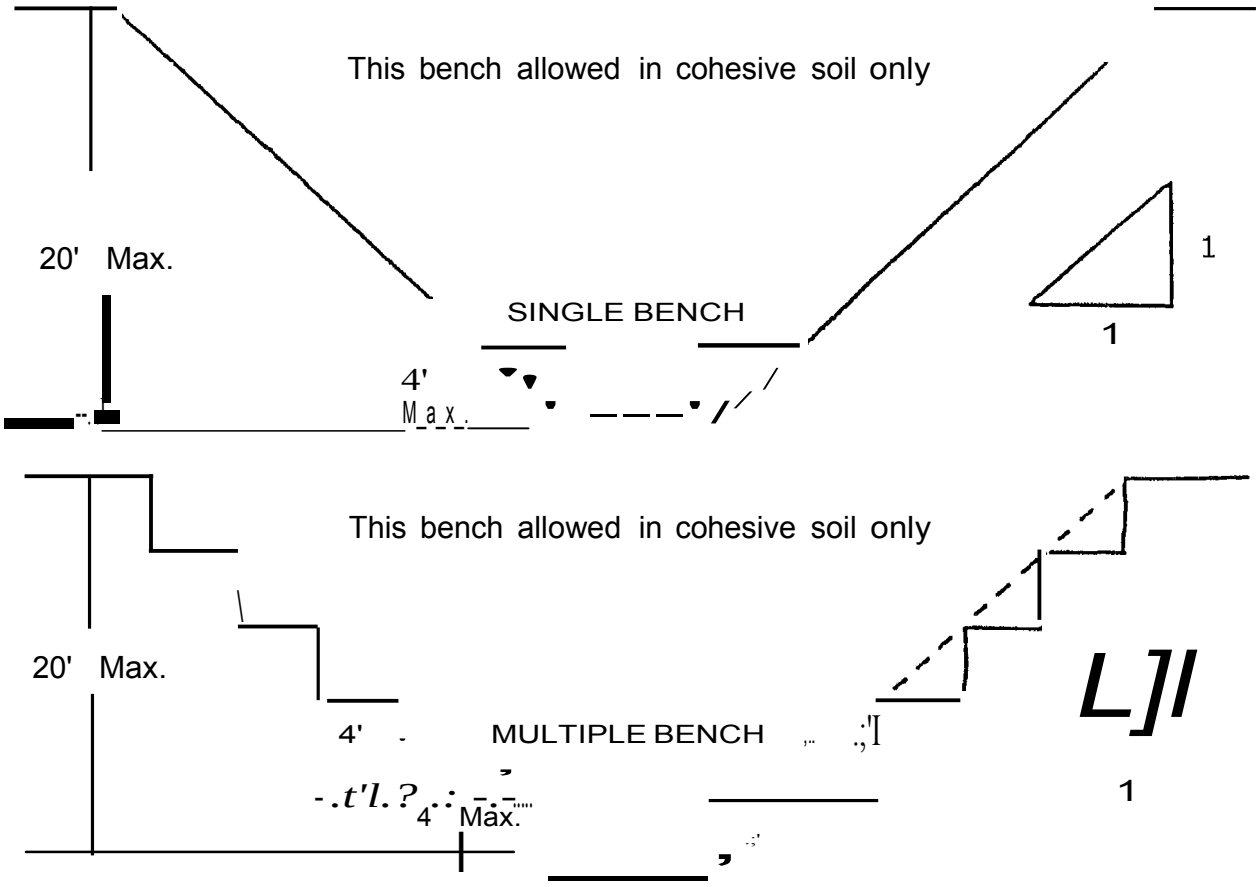
SIMPLE SLOPE

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.



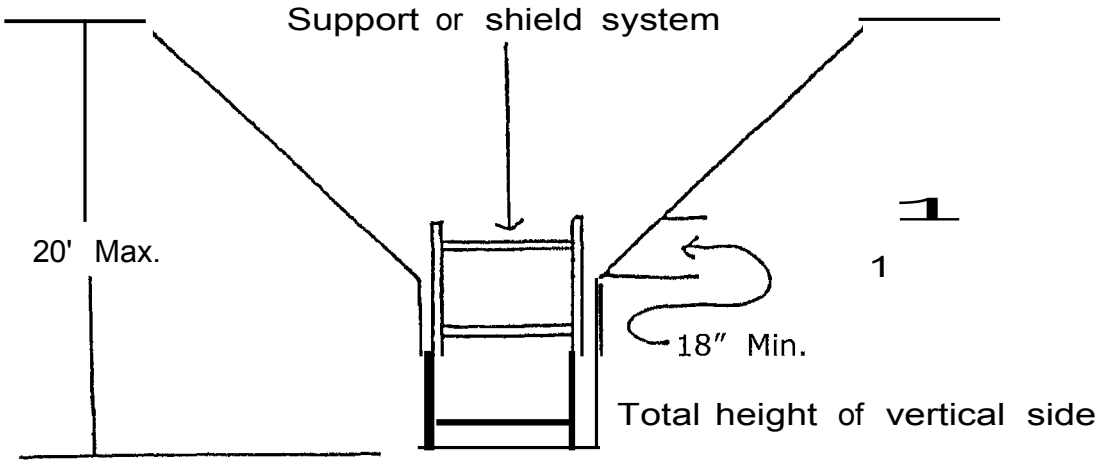
SINGLE BENCH AND MULTIPLE BENCH
(These benches allowed in cohesive soil only).

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:



VERTICALLY SIDED LOWER PORTION

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

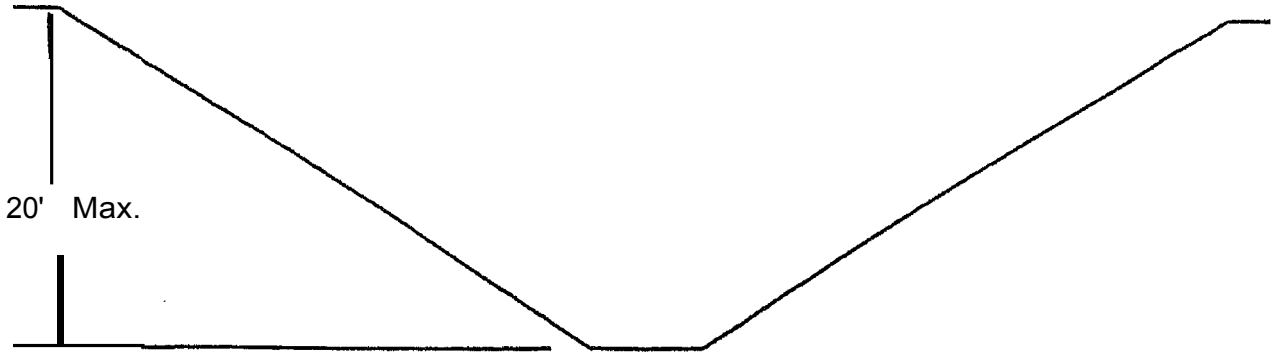


4. All other sloped excavations shall be in accordance with the other options permitted in 1926.652(b).

B - 1.3 Excavations Made in Type C Soil

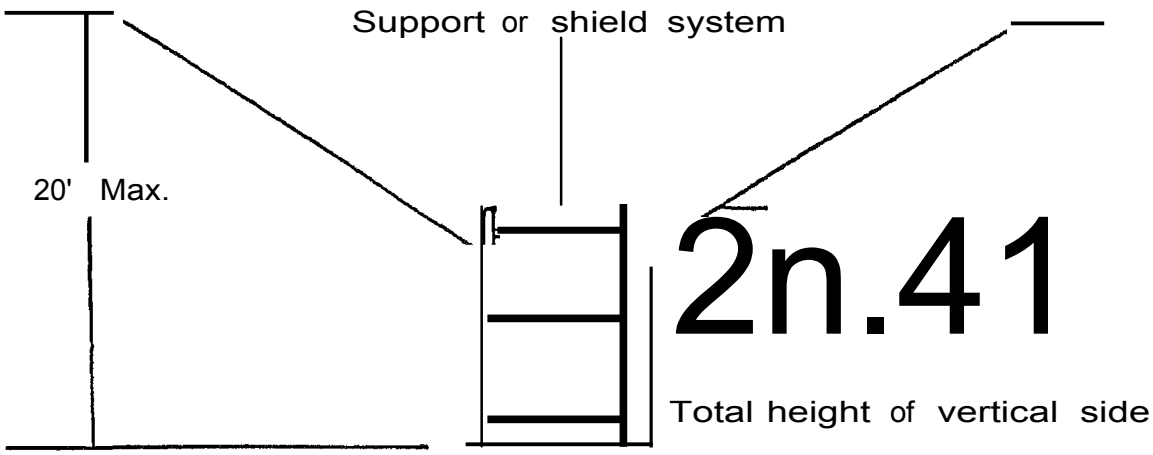
SIMPLE SLOPE

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.



VERTICAL SIDED LOWER PORTION

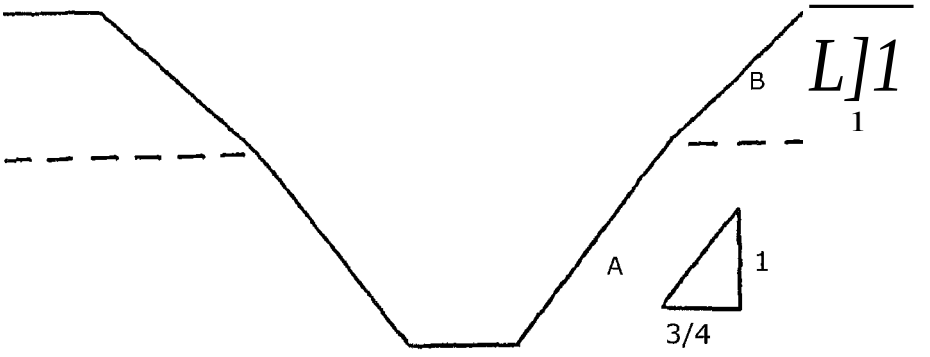
2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1 1/2:1.



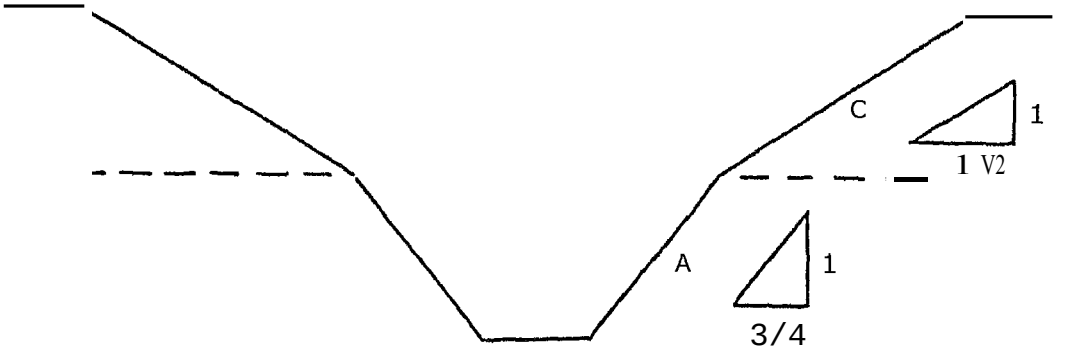
3. All other sloped excavations shall be in accordance with the other options permitted in 1926.652(b).

B -1.4 Excavations Made in Layered Soils

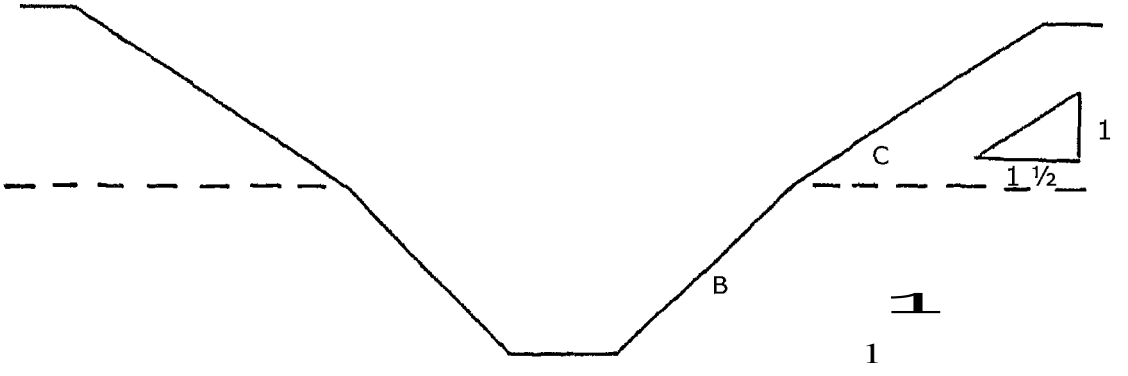
1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



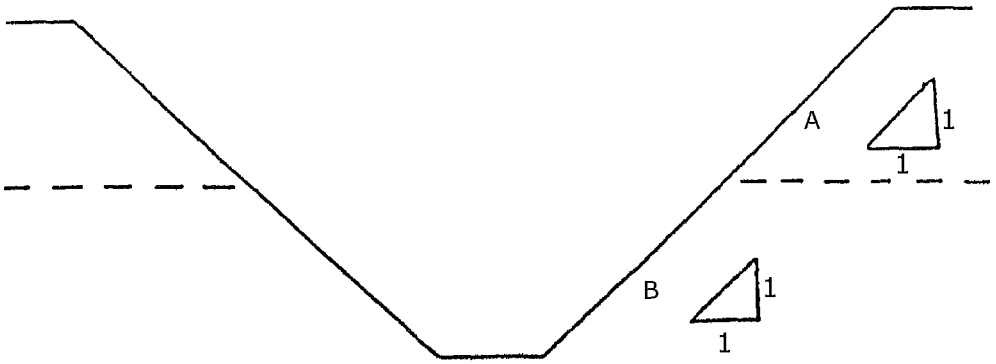
BOVERA



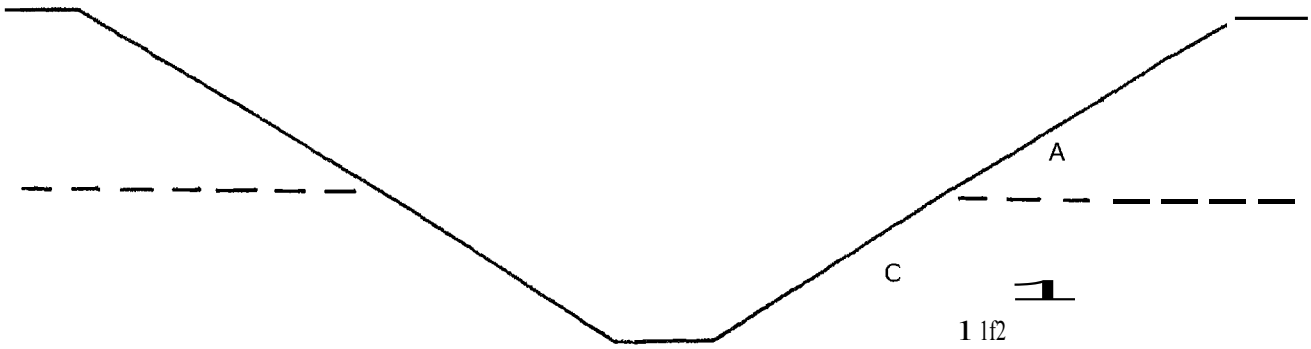
COVERA



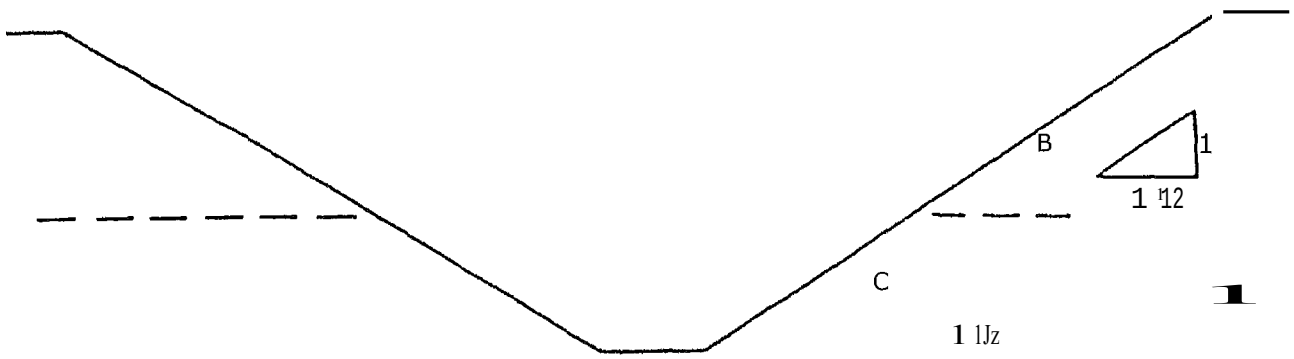
COVERB



AOVERB



AOVERC



BOVERC

2. All other sloped excavations shall be in accordance with the other options permitted in 1926.652(b).

TABLE B -1.1

ALUMINUM HYDRAULICS SHORING <Vertical Shores for Soil Type A)

Depth Of Trench (Feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Width OfTrench (Feet)		
			Up to 8	Over 8, Up to 12	Over 12, Up to 15
Over 5 Up To 10	8	4	2 Inch Diameter	2 Inch Diameter NOTE (2)	3 Inch Diameter
Over 10 Up To 15	8				
Over 15 Up To 20	7				
Over20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g).
NOTE (1): See Appendix D, Item (g)(l)
NOTE (2): See Appendix D, Item (g)(2)

TABLE B -1.2
ALUMINUM HYDRAULICS SHORING (Vertical Shores for Soil Type B)

Depth Of Trench (Feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Width Of Trench (Feet)		
			Up to 8	Over 8, Up to 12	Over 12, Up to 15
Over 5 Up To 10	8	4	2 Inch Diameter	2 Inch Diameter NOTE (2)	3 Inch Diameter
Over 10 Up To 15	6.5				
Over 15 Up To 20	5.5				
Over 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g).
NOTE (1): See Appendix D, Item (g)(l)
NOTE (2): See Appendix D, Item (g)(2)

TABLE B -1.3
ALUMINUM HYDRAULICS SHORING (Waler Systems for Soil Type B)

Depth Of Trench (Feet)	Wales		Hydraulic Cylinder						Timber Uprights		
			Width Of Trench (Feet)						Maximum Horizontal Spacing (On Center)		
	Vertical Spacing (Feet)	Section Modulus (inches^3	UpTo8		Over 8, Up To 12		Over 12, Up To 15		Solid Sheet	2 Feet	3 Feet
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 5 Up To 10	4	3.5	8.0	2 inches	8.0	2 inches NOTE(2)	8.0	3 inches	—	—	3x12
		7.0	9.0	2 inches	9.0	2 inches NOTE(2)	9.0	3 inches			
		14.0	12.0	3 inches	12.0	3 inches	12.0	3 inches			
Over 10 Up To 15	4	3.5	6.0	2 inches	6.0	2 inches NOTE(2)	6.0	3 inches	—	3x12	—
		7.0	8.0	3 inches	8.0	3 inches	8.0	3 inches			
		14.0	10.0	3 inches	10.0	3 inches	10.0	3 inches			
Over 15 Up To 20	4	3.5	5.5	2 inches	5.5	2 inches NOTE(2)	5.5	3 inches	3x12	—	—
		7.0	6.0	3 inches	6.0	3 inches	6.0	3 inches			
		14.0	9.0	3 inches	9.0	3 inches	9.0	3 inches			
Over 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)
NOTES **(1):** See Appendix D, Item (g)(1)
NOTES (2): See Appendix D, Item (g)(2)
*Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE B -1.4

ALUMINUM HYDRAULICS SHORING (Waler Systems for Soil Type C)

Depth Of Trench (Feet)	Wales		Hydraulic Cylinder						Timber Uprights		
	Vertical Spacing (Feet)	Section Modulus (inches)	Width Of Trench (Feet)						Maximum Horizontal Spacing (On Center)		
			Up To 8		Over 8, Up To 12		Over 12, Up To 15		Solid Sheet	2 Feet	3 Feet
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 5 Up To 10	4	3.5	6.0	2 inches	6.0	2 inches NOTE(2)	6.0	3 inches	3x12	—	—
		7.0	6.5	2 inches	6.5	2 inches NOTE(2)	6.5	3 inches			
		14.0	10.0	3 inches	10.0	3 inches	10.0	3 inches			
Over 10 Up To 15	4	3.5	4.0	2 inches	4.0	2 inches NOTE(2)	4.0	3 inches	3x12	—	—
		7.0	5.5	3 inches	5.5	3 inches	5.5	3 inches			
		14.0	8.0	3 inches	8.0	3 inches	8.0	3 inches			
Over 15 UpTo20	4	3.5	3.5	2 inches	3.5	2 inches NOTE(2)	3.5	3 inches	3x12	—	—
		7.0	5.0	3 inches	5.0	3 inches	5.0	3 inches			
		14.0	6.0	3 inches	6.0	3 inches	6.0	3 inches			
Over 20 ‖	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

NOTES (1): See Appendix D, Item (g)(I)

NOTES (2): See Appendix D, Item (g)(2)

*Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE C - 1.1

TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type A $P_a = 25 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (Actual) and Spacing of Members**													
	Cross Braces							Wales		Uprights				
	Horizontal Spacing (Ft.)	Width of Trench (Ft.)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Allowable Horizontal Spacing (Ft.)				
		Upto4	Upto6	Up to 9	Up to 12	Up to 15				Close	4	5	6	8
5 to 10	Up to 6	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—				2x6	
	Up to 8	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—					2x8
	Up to 10	4x6	4x6	4x6	6x6	6x6	4	8x8	4			2x6		
	Up to 12	4x6	4x6	6x6	6x6	6x6	4	8x8	4				2x6	
10 to 15	Up to 6	4x4	4x4	4x6	6x6	6x6	4	Not Req'd	—				3x8	
	Up to 8	4x6	4x6	6x6	6x6	6x6	4	8x8	4		2x6			
	Up to 10	6x6	6x5	6x6	6x8	6x8	4	8xl0	4			2x6		
	Up to 12	6x6	6x6	6x6	6x8	6x8	4	10x10	4				3x8	
15 to 20	Up to 6	6x6	6x6	6x6	6x8	6x8	4	6x8	4	3x6				
	Up to 8	6x6	6x6	6x6	6x8	6x8	4	8x8	4	3x6				
	Up to 10	8x8	8x8	8x8	8x8	8x10	4	8x10	4	3x6				
	Up to 12	8x8	8x8	8x8	8x8	8x10	4	10x10	4	3x6				
Over 20	See NOTE 1.													

* Mixed oak or equivalent with a bending strength not less than 850 psi.

**Manufactured members of equivalent strength may be substituted for wood.

TABLE C - 1.2
TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type B $P_a = 45 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (Actual) and Spacing of Members **												
	Cross Braces						Wales		Uprights				
	Horizontal Spacing (Ft.)	Width Of Trench (Feet)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Horizontal Spacing (On Center)			
		Upto4	Up to 6	Upto9	Up to 12	Up to 15				Close	2	3	
5 to 10	Up to 6	4x6	4x6	6x6	6x6	6x6	5	6x8	5			2x6	
	Up to 8	6x6	6x6	6x6	6x8	6x8	5	8xl0	5			2x6	
	Up to 10	6x6	6x6	6x6	6x8	6x8	5	10xl0	5			2x6	
	See Note 1												
10 to 15	Up to 6	6x6	6x6	6x6	6x8	6x8	5	8x8	5		2x6		
	Up to 8	6x8	6x8	6x8	8x8	8x8	5	10xl0	5		2x6		
	Up to 10	8x8	8x8	8x8	8x8	8xl0	5	10xl2	5		2x6		
	See Note 1												
15 to 20	Up to 6	6x8	6x8	6x8	8x8	8x8	5	8xl0	5	3x6			
	Up to 8	8x8	8x8	8x8	8x8	8xl0	5	10xl2	5	3x6			
	Up to 10	8xl0	8xl0	8xl0	8xl0	10xl0	5	12xl2	5	3x6			
	See Note 1												
Over 20	See NOTE 1.												

* Mixed oak or equivalent with a bending strength not less than 850 psi.
**Manufactured members of equivalent strength may be substituted for wood.

TABLE C - 1.3
TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type C $P_a = 80 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (Actual) and Spacing ofMembers **													
	Cross Braces						Wales		Uprights					
	Horizontal Spacing (Ft.)	Width of Trench (Ft.)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Allowable Horiz. Spacing (Ft.)				
		Upto4	Up to 6	Up to 9	Up to 12	Up to 15				Close				
5 to 10	Up to 6	6x8	6x8	6x8	8x8	8x8	5	8x10	5	2x6				
	Up to 8	8x8	8x8	8x8	8x8	8x10	5	10x12	5	2x6				
	Up to 10	8x10	8x10	8xl0	8x10	8x10	5	12x12	5	2x6				
	See Note 1													
10 to 15	Up to 6	8x8	8x8	8x8	8x8	8x10	5	10x12	5	2x6				
	Up to 8	8x10	8x10	8x10	8x10	8x10	5	12x12	5	2x6				
	See Note 1													
	See Note 1													
15 to 20	Up to 6	8x10	8xl0	8x10	8x10	8x10	5	12x12	5	3x6				
	See Note I													
	See Note 1													
	See Note 1													
Over 20	See NOTE 1.													

*Mixed oak or equivalent with a bending strength not less than 850 psi.
**Manufactured members of equivalent strength may be substituted for wood.

TABLE C - 2.1
TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type A $P_a = 25 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (S4S) and Spacing of Members**												
	Cross Braces						Wales		Uprights				
	Horizontal Spacing (Ft.)	Width Of Trench (Feet)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Horizontal Spacing (On Center)				
		Upto4	Upto6	Upto9	Up to 12	Up to 15				Close	4	5	6	8
5 to 10	Up to 6	4x4	4x4	4x4	4x4	4x6	4	Not Req'd	Not Req'd				4x6	
	Up to 8	4x4	4x4	4x4	4x6	4x6	4	Not Req'd	Not Req'd					4x8
	Up to 10	4x6	4x6	4x6	6x6	6x6	4	8x8	4			4x6		
	Up to 12	4x6	4x6	4x6	6x6	6x6	4	8x8	4				4x6	
10 to 15	Up to 6	4x4	4x4	4x4	6x6	6x6	4	Not Req'd	Not Req'd				4x10	
	Up to 8	4x6	4x6	4x6	6x6	6x6	4	6x8	4		4x6			
	Up to 10	6x6	6x6	6x6	6x6	6x6	4	8x8	4			4x8		
	Up to 12	6x6	6x6	6x6	6x6	6x6	4	8xl0	4		4x6		4x10	
15 to 20	Up to 6	6x6	6x6	6x6	6x6	6x6	4	6x8	4	3x6				
	Up to 8	6x6	6x6	6x6	6x6	6x6	4	8x8	4	3x6	4xl2			
	Up to 10	6x6	6x6	6x6	6x6	6x8	4	8xl0	4	3x6				
	Up to 12	6x6	6x6	6x6	6x8	6x8	4	8xl2	4	3x6	4xl2			
Over 20	See NOTE 1.													

*Douglas fir or equivalent with a bending strength not less than 1500 psi.
**Manufactured members of equivalent strength may be substituted for wood.

TABLE C - 2.2

TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type B P. = 45 X H + 72 psf(2 ft. surcharge)

Depth Of Trench (Feet)	Size (S4S) and Spacing of Members**													
	Cross Braces						Wales		Uprights					
	Horizontal Spacing(Ft.)	Width of Trench (Ft.)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Allowable Horiz. Spacing (Ft.)				
		Upto4	Upto6	Up to 9	Up to 12	Up to 15				Close	2	3	4	6
5 to 10	Up to 6	4x6	4x6	4x6	6x6	6x6	5	6x8	5			4x8		4xl2
	Up to 8	4x6	4x6	6x6	6x6	6x6	5	8x8	5		3x8		4x8	
	Up to 10	4x6	4x6	6x6	6x6	6x8	5	8xl0	5			4x8		
	See Note I													
10 to 15	Up to 6	6x6	6x6	6x6	6x8	6x8	5	8x8	5	3x6	4xl0			
	Up to 8	6x8	6x8	6x8	8x8	8x8	5	IOxiO	5	3x6	4xl0			
	Up to 10	6x8	6x8	8x8	8x8	8x8	5	10x12	5	3x6	4x10			
	See Note 1													
15 to 20	Up to 6	6x8	6x8	6x8	6x8	8x8	5	8xl0	5	4x6				
	Up to 8	6x8	6x8	6x8	8x8	8x8	5	10x12	5	4x6				
	Up to 10	8x8	8x8	8x8	8x8	8x8	5	12x12	5	4x6				
	See Note 1													
Over 20	See NOTE 1.													

*Douglas fir or equivalent with a bending strength not less than 1500 psi.

** Manufactured members of equivalent strength may be substituted for wood.

TABLE C - 2.3
TIMBER TRENCH SHORING- MINIMUM TIMBER REQUIREMENTS*

Soil Type C $P_a = 80 \times H + 72$ psf (2 ft. surcharge)

Depth Of Trench (Feet)	Size (S4S) and Spacing of Members **													
	Cross Braces							Wales		Uprights				
	Horizontal Spacing (Ft.)	Width Of Trench (Feet)					Vertical Spacing (Ft.)	Size (Inches)	Vertical Spacing (Ft.)	Maximum Horizontal Spacing (On Center)				
		Upto4	Up to 6	Upto9	Up to 12	Up to 15				Close				
5 to 10	Up to 6	6x6	6x6	6x6	6x6	8x8	5	8x8	5	3x6				
	Up to 8	6x6	6x6	6x6	8x8	8x8	5	l0x10	5	3x6				
	Up to 10	6x6	6x6	8x8	8x8	8x8	5	l0x12	5	3x6				
	See Note l													
10 to 15	Up to 6	6x8	6x8	6x8	8x8	8x8	5	l0x10	5	4x6				
	Up to 8	8x8	8x8	8x8	8x8	8x8	5	12x12	5	4x6				
	See Note 1													
	See Note 1													
15 to 20	Up to 6	8x8	8x8	8x8	8xl0	8xl0	5	10x12	5	4x6				
	See Note 1													
	See Note 1													
	See Note 1													
Over 20	See NOTE 1.													

*Douglas fir or equivalent with a bending strength not less than 1500 psi.
**Manufactured members of equivalent strength may be substituted for wood.

TABLE D - 1.1

ALUMINUM HYDRAULICS SHORING <Vertical Shores for Soil Type A)

Depth Of Trench (Feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Width OfTrench (Feet)		
			Up to 8	Over 8, Up to 12	Over 12, Up to 15
Over 5 Up To 10	8	4	2 Inch Diameter	2 Inch Diameter NOTE (2)	3 Inch Diameter
Over 10 Up To 15	8				
Over 15 Up To 20	7				
Over20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g).
NOTE (1): See Appendix D, Item (g)(l)
NOTE (2): See Appendix D, Item (g)(2)

TABLE D - 1.2

ALUMINUM HYDRAULICS SHORING (Vertical Shores for Soil Type B)

Depth Of Trench (Feet)	Hydraulic Cylinders				
	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Width Of Trench (Feet)		
			Up to 8	Over 8, Up to 12	Over 12, Up to 15
Over 5 Up To 10	8	4	2 Inch Diameter	2 Inch Diameter NOTE (2)	3 Inch Diameter
Over 10 Up To 15	6.5				
Over 15 Up To 20	5.5				
Over 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g).

NOTE (1): See Appendix D, Item (g)(l)

NOTE (2): See Appendix D, Item (g)(2)

TABLE D - 1.3
ALUMINUM HYDRAULICS SHORING (Waler Systems for SoilJYpe B)

Depth Of Trench (Feet)	Wales		Hydraulic Cylinder						Timber Uprights		
	Vertical Spacing (Feet)	Section Modulus (inches³	Width Of Trench (Feet)						Maximum Horizontal Spacing (On Center)		
			UpTo8		Over 8, Up To 12		Over 12, Up To 15		Solid Sheet	2 Feet	3 Feet
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 5 Up To 10	4	3.5	8.0	2 inches	8.0	2 inches NOTE(2)	8.0	3 inches	—	—	3x12
		7.0	9.0	2 inches	9.0	2 inches NOTE(2)	9.0	3 inches			
		14.0	12.0	3 inches	12.0	3 inches	12.0	3 inches			
Over 10 Up To 15	4	3.5	6.0	2 inches	6.0	2 inches NOTE(2)	6.0	3 inches	—	3x12	—
		7.0	8.0	3 inches	8.0	3 inches	8.0	3 inches			
		14.0	10.0	3 inches	10.0	3 inches	10.0	3 inches			
Over 15 Up To 20	4	3.5	5.5	2 inches	5.5	2 inches NOTE(2)	5.5	3 inches	3x12	—	—
		7.0	6.0	3 inches	6.0	3 inches	6.0	3 inches			
		14.0	9.0	3 inches	9.0	3 inches	9.0	3 inches			
Over 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)
NOTES **(1):** See Appendix D, Item (g)(1)
NOTES (2): See Appendix D, Item (g)(2)
*Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE D - 1.4

ALUMINUM HYDRAULICS SHORING (Waler Systems for Soil Type C)

Depth Of Trench (Feet)	Wales		Hydraulic Cylinder						Timber Uprights		
	Vertical Spacing (Feet)	Section Modulus (inches)	Width Of Trench (Feet)						Maximum Horizontal Spacing (On Center)		
			Up To 8		Over 8, Up To 12		Over 12, Up To 15		Solid Sheet	2 Feet	3 Feet
			Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
Over 5 Up To 10	4	3.5	6.0	2 inches	6.0	2 inches NOTE(2)	6.0	3 inches	3x12	—	—
		7.0	6.5	2 inches	6.5	2 inches NOTE(2)	6.5	3 inches			
		14.0	10.0	3 inches	10.0	3 inches	10.0	3 inches			
Over 10 Up To 15	4	3.5	4.0	2 inches	4.0	2 inches NOTE(2)	4.0	3 inches	3x12	—	—
		7.0	5.5	3 inches	5.5	3 inches	5.5	3 inches			
		14.0	8.0	3 inches	8.0	3 inches	8.0	3 inches			
Over 15 UpTo20	4	3.5	3.5	2 inches	3.5	2 inches NOTE(2)	3.5	3 inches	3x12	—	—
		7.0	5.0	3 inches	5.0	3 inches	5.0	3 inches			
		14.0	6.0	3 inches	6.0	3 inches	6.0	3 inches			
Over 20 ‖	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

NOTES (1): See Appendix D, Item (g)(I)

NOTES (2): See Appendix D, Item (g)(2)

*Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

Appendix G

Fall Protection Materials

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ELEVATED WORK

Attachment 31-1

Fall Protection Checklist		
General	**YES**	**NO**
Do workers know appropriate anchorage points for each task that requires a fall-arrest or restraint system?		
Are all anchorage points stable, substantial, and have sufficient strength to withstand twice the potential impact energy of the free-fall?		
Are all anchorage points for body harnesses located at shoulder height?		
Are anchorage points for self-retracting lifeline systems located overhead?		
Can a worker move from one station to another or climb up and down without exposure to a fall?		
If the lifeline, lanyard or self-retracting lifeline is not permanently attached to an anchorage point at the elevated work area, is the first worker up or the least worker down protected while climbing and traversing?		
Vertical Lifelines	**YES**	**NO**
Does the lifeline have a minimum breaking strength of 5,000 pounds?		
Is the lifeline protected from abrasive or cutting edges?		
Does the system provide fall protection as the worker connects to and releases from the lifeline?		
Is the lifeline arranged so workers never have to hold it for balance? *A lifeline should never be used for balance.*		
Is the vertical segment integrated with the horizontal segment to provide continuous fall protection?		
Horizontal Lifelines	**YES**	**NO**
Has the entire horizontal lifeline system been design and approved by a competent person?		
Have the anchorages to which the lifeline is attached been designed and evaluated specifically for a horizontal lifeline?		
Has the designer of the system approved the number of workers who will be using it?		
Is the rope or cable free from signs of wear or abrasion?		
Does the rope or cable have the required initial sag?		
Have the workers been warned about potential falls?		
Have the clearances been checked?		
Is the hardware riding on the horizontal lifeline made of steel? *Aluminum is not permitted because it wears excessively.*		

ELEVATED WORK

Attachment 31-1

Fall Arresters	**YES**	**NO**
Is the fall arrester compatible with the lifeline on which it is to be installed or operated?		
Is the fall arrester in operational condition?		
Is the fall arrester equipped with a changeover lever that allows it to become a stationary anchor on the lifeline?		
Is the fall arrester equipped with a locking mechanism that prevents unintentional opening of the device and subsequent disengagement from the lifeline?		
Is the fall arrester's "up" direction marked properly to that the equipment can be attached to the line correctly?		
Is the fall arrester included in a regular maintenance program?		
Lanyard	**YES**	**NO**
Is the lanyard length as short as necessary and in no case greater than 6 feet (1.8 meters)?		
Are manually adjustable lanyards used when it is desirable to be able to take slack out of the lanyard?		
Does the lanyard have a shock absorber? Is it obvious to the user that the shock absorber has been deployed? *Is there a warning label, broken punch, etc.*		
Have you prohibited tying of knots from the lanyard to the lifeline? *Mechanical rope grabs or fall arresters must be used.*		
Retractable Lifeline (RL)	**YES**	**NO**
Are workers properly trained to use an RL?		
Is the RL under a regular maintenance and inspection program?		
Is the end of the cable properly spliced?		
Snap Hooks	**YES**	**NO**
Have double-locking snap hooks been used?		
Is the snap hook attached to the D-ring, eyebolt, or other hardware in a manner approved by the manufacturer of the snap hook?		
Are snap hooks inspected regularly or stress, wear, distortion and spring failure?		
Are snap hooks arranged so they are never connected to each other? *The should NOT be connected to each other.*		

ELEVATED WORK

Attachment 31-1

Body Harnesses	**YES**	**NO**
Are full-body harnesses selected for a particular job equipped with all necessary attachment points? *For fall arresting, work positioning, descent control, rescue, or ladder fall-protection systems.*		
Are body harnesses inspected for wear, abrasion, broken stitching, and missing hardware?		
Is the Velcro type of closure prohibited from all load-bearing connections?		
Have workers been instructed in the use and care of body harnesses/body belts?		
Other Considerations	**YES**	**NO**
Has the free-fall distance been considered, so that a worker will not strike a lower surface or object before the fall is arrested?		
Have pendulum-swing fall hazards been eliminated?		
Have safe methods to retrieve fallen workers been planned?		
Is all fall-arrest equipment free of potential damage from welding, chemical corrosion, or sandblasts?		
Are all components of the system compatible according to the manufacturer		
Have employees been properly trained in the following issues?	**YES**	**NO**
Manufacturer's recommendations, restrictions, instructions and warnings		
Location of appropriate anchorage points and attachment techniques		
Problems associated with elongation, deceleration distance, method of use, inspection, and storage		
Are all regular inspections performed by trained inspectors?		
Are written reports maintained?		

ELEVATED WORK

Attachment 31-4

Rolling Tower Scaffold Daily Checklist		
Project Name/Number:		
Weather Conditions:	Date:	
General	**YES**	**NO**
Has the competent person observed the erection of the scaffold?		
Are scaffold components in good/safe condition?		
Is the scaffold plumb and level?		
Is the height of the tower less than 4 times the minimum base width?		
Are casters the proper size and equipped with effective locking devices?		
Are screw jacks extended less than 12 inches?		
Do casters roll freely?		
Are casters and frames locked together?		
Is the tower fully braced on each side?		
Has horizontal bracing been installed at the base and intermediate levels of 20 inches?		
Are guardrails installed properly?		
Have stair-units or ladders and guardrail gates been provided?		
Is the platform fully planked?		
Are scaffold planks in good/safe condition?		
Are toeboards installed where necessary?		
Are scaffold planks secured to prevent uplift or displacement?		
Have employees been trained in the safe use of the equipment?		
Please describe in detail any items above not checked as acceptable and the corrective action taken:		

Signature of Competent Person

ELEVATED WORK

Attachment 31-3

Suspended Scaffold Daily Checklist		
Project Name/Number:		
Weather Conditions:	Date:	
General	**YES**	**NO**
Have all employees using stage scaffolding been trained in the Proper setup, use, disassembly, and care?		
Is the manufacturers manual being followed for setup, use, disassembly and maintenance?		
Are employees using appropriate fall protection attached to independently suspended safety lines?		
Do scaffolds have an overall width of not less than 20 or more than 28 inches?		
Are toeboards and guardrails properly installed?		
Is the Stirrup Frame positioned not less than 12 inches or more than 18 inches from end of the platform and securely fastened in place with U bolts or clamps provided with unit?		
Are power cables secured with a cord restraint?		
Are lifelines securely attached to substantial members of the structure and made of first grade 5/8" nylon rope, 3/4" manila hemp rope or equivalent provided for each employee working on the scaffold?		
Is wire rope hung straight or vertical from the roof supports to the stirrup, and tail of wire rope dropped straight through stage?		
Are all tools, materials and other equipment secured to the stage to prevent overturning or falling?		
Is the building surface protected from abrasion of the staging with building face rollers?		
Have wire ropes been inspected for damage?		
Have wire rope clamps and fastenings been retightened periodically?		
Is wire rope protected from sharp or abrasive edges of building protrusions or surfaces?		
Has all rigging been completed by fully trained employees following the manufactures instructions?		
Has a qualified person inspected parapet and roof conditions for structural integrity?		
Are all anchoring devices capable of supporting 4 times the maximum intended load?		
Are all connections of wire rope to the outrigger made with proper fittings designed for the purpose?		

ELEVATED WORK

Attachment 31-3

Suspended Scaffold Daily Checklist		
General	**YES**	**NO**
Are overhead attachment points maintained at the same distance apart as the hoisting machines?		
Are all overhead rigging, counterweights, anchorages, and connections adequately secured to prevent any movement?		
Is the platform secured to the building face when working?		
Is the platform a safe distance from any electrical power wiring?		
Is wire rope rigged with an adequate length to permit reeving the hoist and to allow at least 6 feet excess on the ground?		
Do tiebacks meet the following requirements? Made of at least 5/16 inch wire rope Breaking strength of 8,060 pounds Three wire rope clamps on each end		
If roof hooks are used, are they the proper rated capacity and is the edge of the cornice adequately protected?		
If parapet clamps are used, has a qualified person inspected the parapet wall for structural strength?		
If counterweighted outriggers are used, are they pitched slightly to the rear?		
Are structurally sound bearing blocks of sufficient size used to distribute loads imposed on the roof?		
If rolling outriggers are used, are they used on a flat roof and secured from movement in any direction?		
Please describe in detail any items above not checked as acceptable and the corrective action taken:		

_____

Signature of Competent Person

ELEVATED WORK

Attachment 31-2

Tubular Welded Frame Scaffold Daily Checklist		
Project Name/Number:		
Weather Conditions:	Date:	
General	**YES**	**NO**
Has the scaffold been erected under the supervision of the competent person?		
Have employees been trained in the hazards and safety requirements of scaffolds?		
Are base plates being used?		
Are mudsills properly installed?		
Is scaffold plumb and level?		
Have scaffold components been inspected for damage?		
Are scaffold components from different manufacturers being used? If so, has the competent person deemed this acceptable?		
Are all cross braces in place?		
Is safe access / egress provided?		
Are any sources of electricity within 10 feet of the scaffold?		
Are scaffold planks made of scaffold grade lumber and in good condition?		
Are planks covered with paint or any opaque finishes?		
Are all working areas fully planked?		
Are scaffold platforms at least 18 inches wide?		
Do scaffold planks extend over the centerline of the support at least 6 inches and no more than 12 unless cleated or restrained?		
When scaffold planks are abutted to form a longer platform, does each plank end rest on its own support?		
Where platforms overlap to create a long platform, does the overlap occur over supports? Is the overlap at least 12 inches unless nailed together or otherwise restrained?		
Where platforms change direction, are planks properly supported?		
Is the scaffold able to support its maximum intended load?		

ELEVATED WORK

Attachment 31-2

Tubular Welded Frame Scaffold Daily Checklist		
General	**YES**	**NO**
Has the scaffold reached a height requiring it to be tied into the structure?		
Is the distance between the front edge of scaffold platform and the face of work 14 inches or less? (18 inches for plastering and lathing)		
Is fall protection being provided at 10 feet for employees working on the scaffold?		
Where guardrails are used, are they installed along all open sides and ends of platforms?		
Is the toprail installed between 38 and 45 inches and capable of supporting 200 pounds?		
Is the midrail installed half way between the toprail and the platform and capable of supporting 150 pounds?		
If crossbraces are used to replace a midrail or toprail, are the end points at each upright 48 inches apart or less?		
Is fall protection feasible for employees erecting or dismantling the scaffold?		
If personal fall arrest systems are being used, will the anchorage support 5000 pounds?		
If employees working on the scaffold are exposed to falling objects, are they being protected by use of hardhats, etc.?		
Are employees working below protected from falling objects by use of toeboards, netting, etc.?		
If toeboards are used, are they at least 3 ½ inches high?		
Do toeboards have a ¼ inch or less clearance between the bottom of the toeboard and the walking or working surface?		
Please describe in detail any items above not checked as acceptable and the corrective action taken:		

Signature of Competent Person

Appendix H

Fire Prevention Materials

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FIRE PROTECTION

Flammable and Combustible Materials Inventory			
Chemical Name/Common Name	**Location**	**Quantity (Wt. or Vol.)**	**Storage Method**

Attachment 5-2
Hot Work Permit

Permit Date: _____ **Job Site/Number:** _____ **Emergency Phone #:** _____

Section 1: Personnel

Person(s) Performing Work: _____

Fire Watch: _____

Supervisor: _____

Section 2: Job Description

___ Arc Welding ___ Oxygen/Gas Welding ___ Brazing ___Other: _____

___ Oxygen/Acetylene Cutting ___ Grinding ___ Hot Tap _____

Section 3: Hazard Abatement

___ YES ___ NO ___ N/A Floors have been swept clean and combustible materials moved for a radius of 35 feet surrounding the area where hot work is taking place. If the floor material itself is combustible, then it will be kept wet, covered with damp sand, or protected by fire resistant shielding. Where floors have been wet down to protect from fire hazard, personnel operating arc welding equipment will take precautions to avoid electric shock.

___ YES ___ NO ___ N/A Cutting or welding will not be permitted in the presence of explosive atmospheres. These atmospheres will be tested with proper air monitoring equipment (i.e., CGI/O_2) prior to commencing hot work.

___ YES ___ NO ___ N/A Cutting or welding shall not be permitted near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper or cotton.

___ YES ___ NO ___ N/A Ducts, piping, or other systems that might carry sparks to distant combustibles have been suitably protected or shut down. These systems shall be either blocked, blanked, or disconnected from process vessels/systems.

___ YES ___ NO ___ N/A Fire resistant shields have been placed to protect walls made of combustible material when hotwork operations cannot be moved.

___ YES ___ NO ___ N/A Proper PPE (welding Goggles/Hood, Properly Tinted Lenses, Welding Gloves, Welding Jacket, etc.) is readily available and in good serviceable condition.

Section 4: Air Monitoring

Monitoring Equipment: _____ Brand Model: _____

Serial #: _____ Calibrated By: _____

TEST ATMOSPHERE	ACTION GUIDELINES =>		TIME						
Combustible Gas	0-10% >10%	No Explosion Hazard Danger: Contact H&S							
Oxygen	20.0 – 22.0% Less than 20.0% 22.0% or Greater	Safe Operating Conditions Oxygen Deficient :Contact H&S Oxygen Enriched :Contact H&S							
Organic Vapor	0 – 3 ppm 3 – 50 ppm 50 – 1000 ppm	Level D (Product Specific) Level C (Product Specific) Level B (Project Specific)							

Contact Health and Safety for Action Guidelines for Other Materials

Section 5: Permit Review and Acknowledgement

By signing below, I certify that I am fully trained in the performance of my duties (either as welder, firewatch, or supervisor) and understand the operational requirements for the equipment to be used, and that I will comply with the guidelines delineated in the KEMRON Welding, Cutting, and Brazing Standard Operating Procedures.

_____ _____

Person(s) Performing Work **Firewatch**

_____ _____

Permit Writer **Authorizing Official (If needed)**

Additional Information (Include any additional signatures, phone numbers, and emergency information needed on permit. Use back of permit, if needed).

Section 6: Task Completion and Permit Close-Out

Comments:

_____

The firewatch will remain in place for 30 minutes after completion of task. This permit must be sent to the Corporate Health and Safety Manager in Marietta, Ohio. A copy of the permit may be kept at the originating office. If there are any questions, please contact the Corporate Health and Safety Manager.

_____ _____

Supervisor (Print and Sign Name) **Date /Time**

Appendix I

Heat Stress Checklist

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HEAT AND COLD STRESS

Heat Stress Checklist	
Work Location:	Date:
Description of Work:	
Names of All Persons Performing Task:	

Type of Work to be Performed (Check One)

- □ Light
- □ Moderate
- □ Heavy

Type of Clothing to be Worn (Check One)

- □ Regular work wear
- □ Regular Anti C's/Coveralls
- □ Impermeable clothing (paper or plastic)
- □ Other (explain) : _____

Respiratory Protection to be Worn (Check One)

- □ SCBA
- □ Respirator
- □ Other (explain) : _____

Work Area Monitoring

WBGT Temperature °F Date/Time Taken /

Work Requirements

- □ Administrative Category (Circle One) I II III IV
- □ Recommended Stay Time: _____
- □ Recommended Rest Time:
- □ Personal cooling garment
- □ Shielding
- □ Fans/blowers
- □ Fluid/electrolyte available
- □ Cool area identified
- □ Two-men required
- □ All personnel trained within the past year

Approval to Commence Work

_____ Job Supervisor's Signature

_____ General Supervisor's Signature

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APPENDIX D

Response to BLM December 2015 Letter Regarding Remedial Work in Area B

RESPONSES TO COMMENTS

Document:	Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, BLM Area B, Former Fort Ord, California
Commenting Organization:	Bureau of Land Management (BLM)
Name:	Eric Morgan
Date of Comments:	December 17, 2015

General Comment 1:

The Bureau of Land Management (BLM) appreciates the efforts of the Army in preparation of the Proposed Plan for BLM Area B and Munitions Response Site 16. As you are aware, about one-half of the land included within the Proposed Plan region is currently administered by the Army, and the other half was transferred to the BLM in 1996. All regions are part of the Fort Ord National Monument that was designated on April 20, 2012. The Proposed Plan governs the overall remediation strategy anticipated within this region, and will guide Work Plans, Prescribed Burn Plans and other cleanup documents related to the Comprehensive Environmental Remediation Compensation and Liability Act (CERCLA) obligations of the Army in this region.

The Proposed Plan calls for additional munitions removals in regions B-3 and B-2A with accompanying land-use controls; and land-use controls only for MRS-16 and BLM Area B Sub-Areas B-1, B-2, B-3A, B-4, B-5, and B-6. Much of the area encompassed by B-3 and B-2A was heavily disturbed during previous military training and there is a tremendous amount of stabilization and restoration that is needed to achieve the overall goals of the Habitat Management Plan. Many of the sites in B-2A were already restored in 2011 and 2012 and I have attached a previous letter to the Army in 2011 that illustrates the restoration areas and explains the partnership that was used to restore those areas.

In a recent meeting with BRAC staff, we were asked to provide preliminary maps showing sites in need of restoration, roads and trails in need of maintenance, roads and trails in need of reroutes, and roads and trails in need of abandonment and/or restoration. This information was requested to aid in the development of future work plans that will specify remediation requirements to support subsurface disturbance. Attached you will find several maps that show the conceptual plans that we have for the B-3 and B-2A regions. These will obviously need to be verified in the field and flagged on the ground to be more meaningful guides for subsurface remediation.

Response to General Comment 1:

(Note: The 30-day public comment for the Proposed Plan was held from April 8 to May 8, 2015. The Army received BLM comments on the Proposed Plan and has responded to them in the responsiveness summary section of the Record of Decision. This BLM letter was received after the Proposed Plan public comment period ended. As the letter pertains to the design of the planned remedial action, the comments have been incorporated in the development of draft Site-Specific Work Plan for BLM Area B remedial action.)

These areas identified in the BLM Letter have been included in the figures attached to the Munitions and Explosives of Concern Remedial Action, BLM Area B Site-Specific Work Plan to the extent possible. Prior to starting subsurface MEC removal for planned BLM trails, the Army will consult with BLM to verify or refine subsurface removal footprints that are most suitable for BLM's planned future land use. In addition, following completion of surface MEC removal and digital geophysical mapping and as part of the Technical Memorandum process, the Army will conduct a joint inspection of a remedial work area with BLM during which additional subsurface removal area may be identified.

Specific Comment 1:

We have great concerns that munitions just beneath the surface might hinder our ability to maintain roads and trails in the future. For our designated fuelbreak roads and trails that span B-3 and B-2A, we need the ability to maintain the trail treads and road surfaces, the drainage structures associate with those routes, and the vegetation nearby. All of these actions result in subsurface disturbance.

The paved and/or chip-sealed fuelbreak roads that cross B-3 and B-2A include segments of Parker Flats Road, Eucalyptus Road, Hennekens Ranch Road, Barloy Canyon Road and Watkins Spur Road. Several of these paved road segments are 20-30' wide or wider, and our agency needs the ability to periodically disturb the surface and subsurface 15' (horizontal measurement) from the edges of these routes as we maintain fuelbreaks. Furthermore, we occasionally may saw cut the pavement and dig below the paved surface in order to patch asphalt cracks and holes, or replace failing culverts beneath the paved surface. These subsurface disturbance activities need to be accommodated in order for us to properly manage and maintain these paved or chip sealed roads. In regards to periodic fuelbreak cutting, where there are trees along the edges of these roads, we frequently will cut beyond 15' from the road edge so that ladder fuels around the trees can be treated. These special circumstances can be flagged on the ground to aid with subsurface cleanup to support the future fuelbreak cutting (see the attached diagram for an explanation).

Response to Specific Comment 1:

It is not the Army's intent to conduct subsurface MEC removal within the footprint of paved and/or chip-sealed fuel break roads. Future activities in these areas should be conducted with UXO construction support which is also selected as part of the remedy for BLM Area B and MRS-16. The Army intends to conduct subsurface MEC removal as shown on Figures 8, 9, 10a-10d from the BLM Area B Site-Specific Work Plan. With regards to areas where periodic fuel break cutting beyond 15' from the road edge is planned, no subsurface removal is currently planned beyond 15 feet from the road as part of the work included in the BLM Area B Site-Specific Work Plan. Escorts provided by qualified UXO personnel for MEC avoidance would be appropriate for conduct of this level of effort.

Specific Comment 2:

The natural surfaced and/or graveled fuelbreak roads that cross B-3 and B-2A include segments of West Machine Gun Flats Road, East Machine Gun Flats Road, Addington Road, Watkins Gate Road and Little Moab Road. Some of these fuelbreak roads are actually greater than 15' wide (i.e. Watkins Gate Road), but we intend to manage these roads as a 15' wide drivable road surface, and 15' (horizontal measurement) of periodic cutting and subsurface disturbance on both sides of each road. In regards to periodic fuelbreak cutting, where there are trees along the edges of these roads, we frequently will cut beyond 15' from the road edge so that ladder fuels around the trees can be treated. These can also be flagged in on the ground to aid with subsurface cleanup to support the future fuelbreak cutting (see the attached diagram for an explanation).

Response to Specific Comment 2:

It is the Army's intent to conduct subsurface MEC removal within the footprint of natural surfaced and/or graveled fuel break roads that cross B-3 and B-2A as shown on Figures 8, 9, 10a-10d from the BLM Area B Site-Specific Work Plan. Typically subsurface removal is planned within the footprint of these roads and 15 feet from the road. Please see response to Specific Comment 1 above.

Specific Comment 3:

The recreational trails that cross B-3 and B-2A include segments of Trail 59, Trail 68, Trail 67, Trail 66, Trail 69, Trail 65, Trail 70, Trail 91, Trail 92, Trail 93, Trail 94, Trail 95, Trail 96, Trail 56, Trail 62, Trail 61, Trail 15, Trail 16, and Trail 57. Each of these trails we manage as a 4' wide travel lane, although there are certainly trails that are narrower and some that are wider. On each of these trails, we need the ability to maintain the trail treads and the drainage structures associate with these routes, and the vegetation nearby. All of these actions result in subsurface

disturbance across a prism that is at minimum 6' (horizontal measurement) from the centerline of each trail.

Response to Specific Comment 3:

It is the Army's intent to conduct subsurface MEC removal within a 12 foot footprint of recreational trails that cross B-3 and B-2A as shown on Figures 9, 10a-10d from the BLM Area B Site-Specific Work Plan.

Specific Comment 4:

Several trails that cross B-3 and B-2A are erosion problems or have other resources concerns and we are proposing to reroute them. The preliminary trail reroutes are shown on the maps and will require further refinement on the ground. It is our understanding that following the brush cutting and/or burning in units B-3 and B-2A, we will have the opportunity to identify and/or flag the reroutes that we are illustrating on the maps. We will also have the opportunity to reestablish and/or delineate the existing trail alignments we want to retain that may become obscured due to chips and material covering the ground following cutting/burning. We are happy to do this to ensure that the trails receive a level of munitions cleanup to support future subsurface disturbance as do our fuelbreak roads.

Response to Specific Comment 4:

Prior to starting subsurface MEC removal for existing BLM trails, the Army will consult with BLM to verify or refine subsurface removal footprints in anticipation of potential reroutes in order to support BLM's planned future land use.

Specific Comment 5:

We are concerned that several of the existing trails we manage and maintain will be damaged and/or destroyed with the cleanup operations if you utilize traditional procedures that have been used within the inland range area. This can occur by taking heavy equipment (including tracked machinery) and breaking through the top layers of a trail surface and loosening the trail tread or damaging drainage features such as rolling dips, outslopes or waterbars. Trail damage and destruction can also occur when the vegetation immediately adjacent to the trail is removed by cutting and/or burning. Trails where we are greatly concerned that removal of the adjacent vegetation would essentially ruin the trail include segments of Trail 67, Trail 56, Trail 62 and Trail 69. It is our hope that a ribbon of vegetation that delineates some of these trail segments be left uncut to provide delineation and character for the trails. We suspect that anomalies could be identified using a hand-held magnetometer in this ribbon of vegetation if there were not many low growing shrubs and low density MEC nearby. The vegetation we are requesting to retain along these trails is almost all mature manzanita or ceanothus shrubs.

Response to Specific Comment 5:

The Army proposes to conduct a joint field visit of these areas prior to commencement of vegetation cutting activities with BLM in order to mark them more clearly for heavy equipment avoidance to the extent possible.

Specific Comment 6:

Finally, we request that restoration sites that we worked hard to restore be protected to the maximum extent possible. Many of these sites were old roads and/or gullies that we reshaped and ripped with heavy equipment, then planted seedlings within. The shrub seedlings in these restoration areas are from 5-10 years old and often sparse. We are happy to delineate these on the ground prior to cutting if that would be helpful.

Response to Specific Comment 6:

The Army proposes to conduct a field visit of these areas prior to commencement of vegetation cutting activities with BLM, MEC remediation contract personnel, and vegetation mastication equipment operators in order to delineate these areas clearly for heavy equipment avoidance to the extent possible.