FINAL
WORK PLAN

Remedial Action in Charlie Area for Four Lead Removal Sites at Fort McClellan, Alabama

Prepared For:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

Unrestricted Comprehensive Environmental Contract
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Delivery Order 0010

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Acronym List

2D	Two Dimensional
AEDA	Ammunition, Explosives and Dangerous Articles
AGM	Analog Geophysical Mapping
ANSI	American National Standards Institute
APP	Accident Prevention Plan
AR	Army Regulation
ARARs	Applicable and Relevant and Appropriate Requirements
ASQ	American Society of Quality
ATFE	Bureau of Alcohol, Tobacco, Firearms and Explosives
BIP	Blow in Place
BRAC	Base Realignment and Closure
CFR	Code of Federal Regulations
CO	Contracting Officer
COC	Chain of Custody
CRL	Corporate Reference Library
CWM	Chemical Warfare Materiel
DA	Department of the Army
DAS	Data Acquisition Specialists
DDESB	Department of Defense Explosive Safety Board
DFW	Definable Feature of Work
DGM	Digital Geophysical Mapping
DGPS	Differential Global Positioning System
DID	Data Item Description
DMM	Discarded Military Munitions
DOD	Department of Defense
DOT	Department of Transportation
DS	Demolition Supervisor
EC	Engineering Control
EHS	Environmental, Health and Safety
EM	Engineer Manual also Electromagnetic
EOD	Explosive Ordnance Disposal
EP	Engineer Pamphlet
EPP	Environmental Protection Plan
ER	Engineer Regulation
ESRI	Environmental Systems Research Institute
ESS	Explosive Safety Submission
EZ	Exclusion Zone
FAR	Federal Acquisition Regulation
FCR	Field Change Request
FTL	Field Team Leader
FTP	File Transfer Protocol
GFP	Government Furnished Property
GIS	Geographic Information System
GPO	Geophysical Prove-out
GPS	Global Positioning System
GSA	General Services Administration
GTM	Geophysical Task Manager
GVW	Gross Vehicle Weight
HARC	Historic, Archeological and Cultural
HAZWOPER	Hazardous Waste Operations & Emergency Response
HD	Hazard Class Designation
HE	High Explosive

HERO	Hazard of Electromagnetic Radiation to Ordnance
HFD	Hazardous Fragment Distance
IAW	In accordance with
ID	Identification
LDD	Loss, damage, or destruction
LPC	Lakewood Processing Center
MC	Munitions Constituents
MD	Munitions Debris
MDAH	Material Designated As Hazardous
MDAS	Material Designated As Safe
MEC	Munitions and Explosives of Concern
MEL	Maintenance Expenditure Limits
MGFD	Munition with the Greatest Fragmentation Distance (replaces MPM)
MK	Mark
MLNWR	Mountain Longleaf National Wildlife Refuge
mm	Millimeter
MP	Man-portable
MPPEH	Material Potentially Presenting An Explosive Hazard
MR	Munitions Response
MRR	Material Received Report
MS	Microsoft
MSD	Minimum Separation Distance
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
mV	Millivolt
NCR	Nonconformance Report
NEW	Net Explosive Weight
O&M	Operations & Maintenance
OE	Ordnance/Explosive
OSHA	Occupational Safety and Health Administration
PA	Purchasing Agent
PCMCIA	Personal Computer Memory Card International Association
PEL	Permissible Exposure Limit
PESM	Project Environmental and Safety Manager
PLS	Professional Land Surveyor
PM	Project Manager
PO	Purchase Order
POC	Point of Contact
PPE	Personal Protective Equipment
PR	Purchase Requisition
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control
QPM	Quality Program Manual
RAM	Random Access Memory
RBC	Risk Based Criteria
RCRA	Resource Conservation and Recovery Act
RCWM	Recovered Chemical Warfare Material
RMP	Risk Management Plan
RTS	Robotic Total Station
SDSFIE	Spatial Data Standards for Facilities Infrastructure and Environment
SDTS	Spatial Data Transfer Standard
SG	Site Geophysicist
SOP	Standard Operating Procedure

SSFR	Site Specific Final Report
SUXOS	Senior UXO Supervisor
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
TDEM	Time Domain Electromagnetic
TIF	Tagged Image File
TIP	Task Initiation Procedures
TM	Technical Manual
TSCA	Toxic Substances Control Act
TtEC	Tetra Tech EC, Inc.
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USFWS	United States Fish and Wildlife Service
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
UXOSO	UXO Safety Officer
UXOSP	UXO Sweep Personnel
UXOQC	UXO Quality Control Specialist
WDCMP	Work, Data, and Cost Management Plan
WP	White Phosphorus

LIST OF DEFINITIONS

Ammunition, Explosives and Other Dangerous Articles (AEDA) Residue. Any explosive or chemical-based munitions, such as small and large caliber ammunition, aerial bombs, grenades, mines, missiles, and rockets. AEDA residue consists of fired cartridge cases, shell fragments, packing material, wooden boxes, metal cans and fiber containers.

Anomaly. An anomaly is any item that is seen as a subsurface irregularity after geophysical investigation. This irregularity should deviate from the expected subsurface ferrous and non-ferrous material at a site, (i.e., pipes, power lines, etc.).

Anomaly Avoidance. Anomaly avoidance techniques are employed by UXO or EOD personnel at sites with known or suspected MEC to avoid any potential surface UXO and any subsurface anomalies.

Area of Concern. Area of potential ordnance and explosives.

Chemical Warfare Materiel (CWM). An item configured as a munition containing a chemical substance that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. Also includes V- and G- series nerve agent, H- series blister agent, and Lewisite in other-than-munition configurations; and certain industrial chemicals (e.g., hydrogen cyanide (AC), cyanogen chloride (CK), or carbonyl dichloride (called phosgene or CG) configured as a military munition. Due to their hazards, prevalence, and military-unique application, chemical agent identification sets (CAIS) are also considered CWM. CWM does not include: riot control agents, chemical herbicides; smoke and flame producing items; or soil, water, debris, or other media contaminated with chemical agent. (HQDA Interim Guidance for Biological Warfare Materiel and Non-Stockpile Chemical Warfare Materiel Response Activities)

Demolition. Destruction of structures, facilities, or material by use of fire, water, explosives, mechanical, or other means.

Discarded Military Munitions (DMM). Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

Detonation. A chemical reaction that propagates with such rapidity that the rate of advance of the reaction zone into the unreacted material exceeds the velocity of sound and explosions.

Engineering Controls. Regulation of UXO operations through the use of prudent **engineering** principles, such as sandbag enclosures and Miniature Open Front Barricades (MOFB)

Fuze. A **device** with explosive components designed to initiate a train of fire or detonation in an item of ammunition by an action such as hydrostatic pressure, electrical energy, chemical action, impact, mechanical time, or a combination of these.

EM61 system (Time-Domain Electromagnetic Induction Metal Detector). A geophysical survey instrument that utilizes the rate at which electromagnetic signals in the ground decrease to detect and map metal objects that are buried near ground level (less than 10 feet below ground surface).

Expended Ordnance. A munition that has functioned as designed, leaving the shell or container behind. This shell or container may or may not contain explosive/pyrotechnic/toxic residue. This material would not be considered inert, and could not be salvaged as scrap without appropriate visual inspection, sampling, and/or treatment.

Explosive Ordnance Disposal (EOD). The detection, identification, field evaluation, rendering safe, recovery, evacuation, and disposal of explosive ordnance that has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material.

Explosive Ordnance Disposal (EOD) Personnel. Active duty military personnel who have completed the training course at the U.S. Naval School, Explosive Ordnance Disposal (EOD), Indian Head, Maryland and are currently assigned to a military EOD unit.

Explosives Safety Submission (ESS). The ESS serves as the specifications for conducting work activities at the project. The ESS details the scope of the project, the planned work activities, and potential hazards (including the maximum credible event) and the methods for their control.

Fluxgate Magnetic Gradiometer (Schonstedt). Instrument that measures changes in the magnetic field of the earth caused by the presence of iron- or steel-bearing objects in the near surface of the earth.

Grid. A geographic parcel of land ranging from 100’ x 100’ to 200’x5 0’ to 400’ x 100’ in size. The number of grids within a sector is dependent upon the size of the sector and the size of the grids.

High explosive (HE) An explosive that normally detonates rather than burns; that is, the rate of detonation exceeds the velocity of sound.

Inert. Ordnance, or components thereof, that contain no explosives, pyrotechnic, or chemical agents.

Inert Ordnance. Ordnance that never contained explosives (e.g., munitions manufactured for classroom instruction).

Intrusive Activity. An activity which involves or results in the penetration of the ground surface at an area known or suspected to contain MEC. Intrusive activities can be of an investigative or removal action nature which consists of excavating suspected UXO items or plotted anomalies. Excavation activities on UXO sites are performed by UXO qualified personnel only.

Live. A slang term indicating ordnance containing explosives or active chemicals.

Magazine. A structure used for the storage of ammunition and explosives.

Military Munitions. Includes all types of both conventional and chemical ammunition products and their components, produced by or for the military for national defense and security.

Munitions and Explosives of Concern (MEC). This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (A) Unexploded ordnance (UXO), as defined in 10 U.S.C. 101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 U.S.C. 2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munition with the Greatest Fragmentation Distance (MGFD). The munition with the greatest fragment distance that is reasonably expected (based on research or characterization) to be encountered in any particular area.

Munitions Constituents (MC). Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris. Remnants of munitions (e.g., penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization or disposal

Non-ordnance and Explosive Metal Debris. Metal debris recovered during operations that is not ordnance-related, such as metal rebar, angle iron, sheet metal, bar stock, etc.

Non-MEC Scrap. Items that are non-ordnance-related including, but not limited to: wooden boxes, wire, banding material, trash, auto parts, and nails.

Range Residue. Material including, but not limited to practice bombs, expended artillery, small arms and mortar projectiles, aircraft bombs and missiles, rockets and rocket motors, hard targets, grenades, incendiary devices, experimental items, demolition devices, and any

other material fired on, or upon a range (Also referred to as MEC-related scrap).

Removal Action. Removal action is the cleanup or removal of MEC from the environment to include the disposal of removed material. The term includes, without being limited to, security fencing or other measures to prevent, minimize, or mitigate damage to the public health or welfare or to the environment.

Surface Clearance. Consists of using UXO personnel to "sweep" an area and remove items on the ground surface. The items removed are limited to those that can be placed in the back of the explosives transport vehicle.

Unexploded Ordnance (UXO). Military munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material, and remain unexploded either by malfunction, design, or any other cause.

UXO Clearance. The surface or subsurface removal of identified unexploded ordnance from a defined area.

UXO Personnel. Any former member of the United States Armed Forces who has graduated from the U.S. Naval School, Explosive Ordnance Disposal, Indian Head, Maryland, served in EOD billets and assignments while on active military duty, and now works as a civilian specialist with UXO items/materials. If a UXO Technician I, can be a graduate of a DOD certified equivalent course in lieu of the EOD Assistant's Course at Redstone Arsenal, AL or at Eglin AFB, FL.

1.0 INTRODUCTION

1.1 GENERAL PURPOSE AND SCOPE

Tetra Tech EC, Inc. (TtEC) has prepared this Site-Specific Work Plan (SSWP) to describe the technical approach and methodology for the execution of Delivery Order 0010 at selected sites of the Charlie Area in Fort McClellan, AL. On October 10, 2008, the U.S. Army Engineering and Support Center contracted TtEC under Contract Number W912DY-04-D-0011, Task Order 0010, to complete a Remedial Action (RA) at selected sites. The technical scope of this effort is defined in detail in the Performance Work Statement (PWS), Charlie Area Remedial Action, Fort McClellan, AL, June 26, 2008. The PWS is included in Appendix A.

Results of the *Draft Remedial Investigation (RI) for the Bains Gap Road Ranges*, the *Draft RI for the Ranges near Training Area T-24A*, the *Final RI for the Former 81mm Mortar Range*, and the *Draft RI for Baby Bains Gap Road Ranges* indicated that these designated areas for MEC removal activities have known areas that contain lead contamination above the industrial site-specific screening level (SSSL) for lead (i.e., 880 mg/kg). The SSSL were developed for human health and ecological risk evaluations as part of the ongoing site investigations performed under the BRAC Environmental Restoration Program at Fort McClellan (IT, 2000). Health and Safety procedures to protect workers during TtEC site activities have been developed and are provided in the Lead Compliance Plan (Attachment 5 of Appendix D).

1.1.1 Objectives

The objective of this project is to provide munitions response (MR) services necessary to accomplish RA at selected sites of the Charlie Area in Fort McClellan, AL. All sites listed will be cleared to the depth of detection. The selected sites are:

- 81mm Mortar Range
- Range 20
- Range 24A (12 acres of Range 24A will be Surface Cleared only due to USFWS identifying it as a sensitive area.)
- Bains Gap Road Ranges (Includes the Tire House Removal)

1.1.2 Work Plan Outline

This Work Plan meets the requirements of Data Item Description (DID) MR-005-01, Engineering Manual (EM) 1110-1-4009, and includes the following sub-plans:

- Technical Management Plan (Chapter 2.0) – details the approach, methods, and procedures for UXO and technical operations. Outlines personnel responsibilities.
- Explosives Management Plan (Chapter 3.0) – details explosives management in accordance with (IAW) applicable federal, state, and local regulations.
- Explosives Siting Plan (Chapter 4.0) – describes the safety criteria to be employed during MEC operations.
- Geophysical Prove-out (GPO) Plan. (Chapter 5.0) – Outlines the GPO test plot design

and quality control procedures that will occur during the GPO.

- Geophysical Investigation Plan (Chapter 6.0) – details the approach, methods and operational procedures to be performed during the geophysical operations.
- Accident Prevention Plan (Appendix D) – establishes the procedures and control measures required to protect personnel from on-site hazards.
- Geospatial Information and Electronic Deliverables Plan (Chapter 7.0) – sets the guidelines for establishing grid boundaries and marking anomaly positions.
- Work, Data, and Cost Management Plan (Chapter 8.0) – details the management of allocated funds, equipment and personnel resources.
- Quality Control Plan (Chapter 10.0) – specifies the policies and procedures for conducting quality management.
- Environmental Protection Plan (Chapter 11.0) – documents site-specific conditions prior to operations, addresses the potential impacts that operations may have on the environment, and proposes measures to protect environmentally sensitive areas.

1.2 SITE LOCATION

Fort McClellan is located northeast of the City of Anniston, Calhoun County, Alabama. To the west of the Fort are the areas known as Weaver and Blue Mountain. To the north is the City of Jacksonville. The Talladega Forest is located east of the Fort. The portion of Fort McClellan to be addressed in this SSWP has been designated the Charlie Area, and lies in the eastern portion of the facility, east of the main cantonment area. The Charlie Area is comprised of portions of the Choccolocco Mountains and the Choccolocco Corridor to the east of the mountains. The Charlie Area, with the exception of the Choccolocco Corridor portion which is owned by the state of Alabama, has been transferred to the Department of the Interior for management by the Fish and Wildlife Service as a wildlife refuge, the Mountain Longleaf National Wildlife Refuge (MLNWR). The MEC Clearance Overview map which depicts the location of Fort McClellan with the 4 Charlie Area Ranges highlighted is located in Appendix B.

1.3 SITE HISTORY

Fort McClellan has documented use as a military training area since 1912, when the Alabama National Guard used it for artillery training. However, the Choccolocco Mountains may have been used for artillery training by the units stationed at Camp Shipp in the Blue Mountain Area during the Spanish American War as early as 1898. The 29th Infantry Division used areas of Fort McClellan for training prior to being ordered to France during World War I (WWI). In 1917, Congress authorized the establishment of Camp McClellan and in 1929, the camp was officially designated as Fort McClellan. Prior to World War II (WWII), the 27th Infantry Division assembled at Fort McClellan for training. Many other units used the site for various training purposes during the war. Following WWII, in June 1947, the Fort was deactivated. It was reactivated in January 1950. The site was used for National Guard training to include basic training and was also selected as the site for the Army's Chemical Corps and Military Police Schools.

1.3.1 The history of Fort McClellan, as described in the Archives Search Report (ASR) Findings (USAESCH, 2001a) and Archives Search Report Conclusions and Recommendations (USAESCH, 2001b) includes training activities and demonstrations that used conventional weapons (i.e., mortars, anti-tank guns, and artillery pieces). Chemical warfare training occurred during several periods of time that included the use of such items as chemical agent identification sets (CAIS), smoke pots, flame field expedients (FFE), rifle and smoke grenades. In 1973, the Chemical Corps School along with the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency closed. In 1979, the U.S. Army Chemical Corps School was re-established along with a Training Brigade for Basic Training and the Military Police School.

1.3.2 Fort McClellan was recommended for closure under the Base Realignment and Closure (BRAC) Program, and was closed in September 1999. The USAESCH contracted to complete site characterization activities and an Engineering Evaluation/Cost Analysis for areas within Fort McClellan including Charlie. The final EE/CA for the Charlie Area is pending a modification to incorporate supplemental sampling requirements.

1.3.3 The United States Fish and Wildlife Service (FWS), along with the Anniston-Calhoun County FMC Development Joint Powers Authority (JPA), established the Mountain Longleaf National Wildlife Refuge on a portion of Fort McClellan within the Charlie Area. The refuge was established on June 1, 2003. The old growth stands of mountain longleaf pine, located in the Charlie Area, are some of the few left in the United States. The mountain ecosystem that exists in the Charlie Area is essentially the only one in the United States. Rare and uncommon plant species, such as the white fringeless orchid, exist in areas of the forest with spring water seeps. Many of the former Charlie lands now included in the wildlife refuge are suspected to contain UXO.

1.4 TOPOGRAPHY

The topographic gradient at Fort McClellan generally increases toward the south and east of the main installation, with local relief in excess of 1,320 feet. The lower elevations (~700 feet above mean sea level [msl]) occur along Cane Creek, near Baltzell Gate Road, while the maximum elevation (2,063 feet above msl) occurs in the Choccolocco Mountains, which traverse the area in a north/south direction. The Choccolocco Mountains have very steep easterly slopes grading abruptly into Choccolocco Valley. The western slopes are more continuous, with the southern extension maintaining elevations up to 900 feet above msl near the western reservation boundary. The northern extension decreases in elevation in the vicinity of Reilly Airfield. The central portion of Fort McClellan, in the vicinity of the Main Cantonment Area, is characterized by flat to gently sloping land. Topography within the Charlie Area consists of gently to steeply sloped rolling hills in the western portion of the area and rugged steep terrain in the Choccolocco Mountains to the east. The Choccolocco Corridor east of the mountains is predominated by gently rolling hills. Elevations range from approximately 800 feet above msl in places along the western edge of Charlie to over 2,000 feet above msl at the highest point along the crest of the Choccolocco Mountains. Surface drainage is predominantly to the west on the western side of the mountains and predominantly to the east on the eastern side of the Choccoloccos.

1.5 CLIMATE

Fort McClellan is situated in a temperate, humid climate. Summers are hot and long, and winters are usually short and mild to moderately cold. The climate is influenced by frontal systems moving from northwest to southeast, and temperatures change rapidly from warm to cool due to the inflow of northern air. The average annual temperature is 63 degrees Fahrenheit (ºF). Summer temperatures usually reach 90ºF or higher about 70 days per year, but temperatures above 100ºF are rare. Freezing temperatures are common but are usually of short duration. The first frost may arrive by late October. At Anniston, the average date of the first 32ºF temperature is November 6, and the last is March 30. This provides a growing season of 221 days. The average annual rainfall is approximately 53 inches and is well distributed throughout the year. Snowfall averages 0.5 to 1 inch. On rare occasions, several inches of snow accumulate from a single storm. Winds in the Fort McClellan area are seldom strong and frequently blow down the valley from the northeast.

2.0 TECHNICAL MANAGEMENT PLAN

2.1 GENERAL

This Technical Management Plan details the approach, methods, and operational procedures that will be used at the Site. This chapter contains all elements required by U.S. Army Corps of Engineers (USAESCH) DID MR-005-01.

2.2 GUIDANCE, REGULATIONS AND POLICY

The detection, identification, removal and disposal of MEC will be accomplished as described in the PWS (as issued by the Government) and IAW the appropriate guidance, regulations, and policy documents identified in Chapter 15 (References) of this plan.

All activities involving work in areas potentially containing MEC hazards will be conducted in full compliance with USAESCH, Department of the Army (DA), and Department of Defense (DOD) requirements regarding personnel, equipment and procedures. 29 Code of Federal Regulations (CFR) 1910.120 will apply to all actions taken at this site.

2.3 PROCEDURES FOR CHEMICAL WARFARE MATERIEL (CWM) DISCOVERY

Part of the Range 24A area (fenced area) was used for CWM disposal training and was in the CWM EE/CA. It had a subsequent 3X scrap removal by Shaw. No CWM is expected in the area. If suspected CWM is encountered during this conventional MEC removal, all work will immediately cease. All project personnel will withdraw along cleared paths upwind from the discovery. The senior UXO person on site will designate a two-person team to secure the area to prevent unauthorized access. This team will position themselves as far upwind as possible while still securing the area. The senior UXO person on site will notify TtEC's Project Manager, the Contracting Officer, the Transition Force Security Office, and the OE Safety Specialist (Safety Specialist) who will make appropriate notifications for explosive ordnance disposal (EOD) response. The two-person team will secure the site until the arrival of the EOD unit. Additional reporting instructions are contained in CEMP-CE Memorandum, Notification Procedures for Discovery of Recovered Chemical Warfare Materiel (RCWM) during USAESCH Projects.

2.4 PROCEDURES FOR OFF-SITE MEC DISPOSAL IF AN AREA CANNOT WITHSTAND HIGH-ORDER DETONATION

The safest procedure for personnel when encountering MEC is to destroy the MEC in place using Blow in Place (BIP) explosive procedures. Standard procedures will be used to dispose of all located MEC items daily for BIP items and weekly for all other items required to conduct demolition procedures on. All located MEC will be disposed of in the position/location found. In the event an area cannot withstand a high order detonation, items that can be safely moved will be consolidated with other MEC items for disposal. If an item is located that is considered unacceptable to move and the area cannot withstand a high order detonation, engineering controls will be used to reduce the blast and fragmentation effect of a detonation and the item will be disposed of in place. If, in the opinion of the Senior UXO Supervisor (SUXOS), the area cannot withstand a high order detonation with the application of engineering controls, the SUXOS will notify the OE Safety Specialist that the item cannot be BIP and await instructions. The item(s) will be placed under 24-hour guard until instructions are received from the OE Safety Specialist or until an authorized party takes control of the item. Alternative security measures may be employed with the approval of the OE Safety Specialist. The Safety Specialist may request that TtEC contact the nearest EOD Unit for disposition of the item(s).

2.5 UNIDENTIFIED MEC RECOVERIES

Trained UXO personnel will make MEC identifications. Identifications will be made based on personal experience and will be guided by information contained in appropriate ordnance publications. The SUXOS will verify all MEC identifications. In the event the site UXO personnel are unable to identify a suspect MEC item, the SUXOS will request assistance from the OE Safety Specialist. If site personnel are not able to fully identify suspect MEC, the item(s) will be photographed with a digital camera and the photograph will be electronically transmitted to USAESCH to facilitate their assistance in identification. The item(s) will be placed under 24-hour guard until instructions are received from the OE Safety Specialist or until an authorized party takes control of the item. Alternative security measures may be employed with the approval of the Safety Specialist.

2.6 TECHNICAL SCOPE

The technical scope of this effort is defined in the PWS, which is included in Appendix A. The complete list of tasks (as shown in the task order) is presented below. Tasks 01 and 02 are preparatory activities, most of which have been accomplished as of the submittal date of this Work Plan. The remaining tasks are addressed in this Work Plan.

- Task 1 Project Preparation and Planning
- Task 2 Work Plan
- Task 3 Geophysical Field Work
  - Task 3a Analog Geophysical Methods
  - Task 3b Digital Geophysical Methods

- Task 3c Disposal of lead-contaminated soil
- Task 4 Removal Actions – Surface and Subsurface Clearances
- Task 5 Geospatial Data
- Task 6 Site Specific Final Report
  - Task 6a Meetings
  - Task 6b Additional Meetings (Optional).

The processes for conducting these tasks are described in the following Chapters.

2.6.1 Site Preparation

Border and Grid Setout, Surface Clearance, and Brush Clearance are site preparation tasks which are listed under Task 4 in the PWS but are presented in the following section in the order that they will be accomplished to facilitate a safe and efficient work process.

2.6.1.1 Border and Grid Setout (Task 4)

Boundaries of the 4 work areas will be surveyed and marked by a Registered Land Surveyor (RLS). A qualified UXO Technician will provide escort to surveyors during surveying activities for safety reasons. All location surveying and mapping will be performed in Alabama State Plane East FIPS 0101, NAD83 Projection (feet). TtEC will use pre-existing survey control points within the site boundaries as available. Following the boundary surveys, a two-person team will establish and mark grid corners. The grid layout will be constructed under the guidance of the SUXOS to ensure the grids constructed meet the project needs and requirements. Grids will be configured to a 100 x 100 foot dimension, although it is likely that some nonstandard size grids will be necessary in order to accommodate the topography and terrain. Grids will be marked with both visual surface identifiers and semi-permanent subsurface markers (nails). Additional detail is provided in Chapter 7.0, Geospatial Information and Electronic Submittals.

2.6.1.2 Surface Clearance (Task 4)

TtEC will employ surface clearance teams comprised of (1) UXO Technician III, (1) UXO Technician II and up to (6) UXO1/UXO Sweep personnel. For every additional (1) UXO Technician II (6) additional UXOI/UXO sweep personnel may be added to the basic sweep team composition IAW DID OE-025.01. Surface clearance activities will be conducted prior to brush cutting and DGM operations in all areas with the exception of a 12 acre portion of Range 24A that has been identified as a sensitive area by USFWS. Surface clearance only will be performed in this 12 acre portion of Range 24A due to the presence of wetlands, seeps, and springs located in the area.

The surface clearance operations will locate and remove potential explosive hazards on the surface so the non-intrusive field teams can operate in the project areas safely. The surface clearance teams will also remove surface metallic clutter prior to DGM operations to facilitate high quality data. The Schonstedt Model 52CX ordnance locator (or equivalent) will be used to assist in locating surface objects in areas overgrown with vegetation. Using magnetic locators like the Schonstedt Model 52CX ordnance locator

will allow for the team to conduct the surface clearance operation in a line allowing for overlap in the sweep lanes without the instruments interfering with each other like the EM type locators. If an item is encountered that is partially exposed above the ground surface only qualified UXO Technicians will perform limited excavation of the item. Surface clearance personnel will not perform intrusive activities. No intrusive efforts will be made to remove suspect items entirely below the ground surface. Personnel will search each grid using standard detector-aided visual surface clearance procedures. The surface clearance teams will use the line abreast method, removing all metallic objects located. This method involves team members walking side by side, separated by a distance that does not exceed visual coverage of the adjoining person's field of view, visually scanning the surface terrain. Each team member will use a hand-held magnetometer to assist in finding metallic items. Traffic cones (if applicable) will be placed at the ends of the grid to aid the team in walking a straight line, and the person on the end of the sweep line will guide on the traffic cone until the team reaches the edge of the grid, then the traffic cone will be moved over to be used on the next pass. In areas where the traffic cone approach cannot work or adequate coverage is not maintained, each grid will be subdivided into lanes or sub-grids using rope (or other method, as directed by the SUXOS) to ensure complete coverage. This procedure will be repeated until the entire grid has been searched. All cultural and target debris within the gridded project area will be removed. This includes the fencing at Range 24a, car bodies and other scrap items. Culverts if encountered in the gridded project area will be removed and turned over to USFWS. All material removed will be certified and disposed of at an approved, appropriate off-site facility.

The SUXOS will assign each surface clearance team specific grids to search. A map showing all 100' x 100' grid locations with their identification numbers will be used for plotting and recording the status of clearance activities. Team leaders will record all MEC items found in the assigned grids. The MEC Tracking Log will be used to track the status of individual pieces of MEC and explosive MC, as appropriate, the forms are provided in Attachment F. For scrap removed the Team Leaders will document the quantity in pounds removed from each grid along with general comments on the type of scrap removed. The Team Leader will use the electronic forms contained in the PDA or on the Surface Clearance Data Forms, and, as necessary, on the Intrusive Investigation Data/ MEC Accountability Form. All required information must be entered into the data forms (electronic or manual) at the time of the investigation. All information on the top of the Intrusive Investigation Data/MEC Accountability Form will be completed in the field by the Team Leader. The lower portion of the form will be completed by the SUXOS.

2.6.1.2.1 Marking and Collecting Procedures

When UXO sweep personnel locate an item, he/she will alert the team leader who will halt the line. The team leader will then examine the discovered item and determine if it is live or inert. When it is necessary to mark items the following flagging scheme will be utilized; Inert items will be marked with blue flags, suspect items with yellow flags, and dangerous (live) items with red flags. If an item is partially above the surface, it will be marked with an appropriately colored flag for later removal (if applicable). (Note: the flag colors may vary depending on availability and the SUXOS will ensure all involved personnel are aware of the color designations.) All surface MEC will be identified and removed. MEC that is acceptable to move will be consolidated within the grid or removed for disposal. If MEC is not acceptable to move, it

will be blown in place, or secured until disposal can be arranged. MPPEH that has been certified as MDAS will be marked and removed to the MPPEH secure storage site. MPPEH that is classified as MDAH will be disposed of during MEC disposal operations. MPPEH that requires further inspection will be transported to the MPPEH processing site for storage pending certification/verification. All MPPEH items will be properly documented and stored in accordance with SOP 5 Management and Disposition for Material Potentially Presenting an Explosive Hazard (MPPEH) contained in Appendix I.

2.6.1.3 Brush Clearance (Task 4)

Brush clearance will be conducted in accessible areas on the work sites. Brush will be cut as low as possible to permit the best quality data during subsequent geophysical activities. Trees measuring less than 4-inches in diameter at chest level will be removed if required to facilitate data collection in the area. Brush and grass will be trimmed 4-6 inches where necessary above the ground surface. Vegetation removed will be chipped/shredded and re-dispersed on site. The brush clearance activities will be escorted by a qualified UXO Technician.

2.6.2 Task 3 – Geophysical Field Work

The primary phases for the geophysical investigation include planning, performance and acceptance of the geophysical prove-out (GPO), data acquisition, data processing, data interpretation-generation of dig sheets, and anomaly relocation and resolution. Chapters 5 and 6 of this work plan contain the specific procedures that will be utilized for the execution of the GPO and geophysical field work which include analog and digital geophysical mapping methods.

Two data collection and target re-acquisition teams managed by the Site Geophysicist will be used for this project. Each team will consist of 2 to 3 UXO Technicians. Staff conducting geophysical activities will have received training in the proper setup and use of the geophysical data collection systems selected for this project, as well as site specific training to ensure that they are fully familiar with site-specific conditions that may affect the quality of geophysical data.

Approximately 122 acres will be surveyed using either Digital Geophysical Mapping (DGM) methods or analog methods. An analysis of the topography indicates that approximately 100 acres is less than 40% slope and can be surveyed using DGM methods. The remaining acreage (approx.22 acres) greater than 40% slope will be surveyed using analog methods for detection if the terrain is too steep for DGM. A 100ft x 100ft grid system will be established over each survey area.

Grid corners will be utilized to define grids that are DGM versus analog methods. If grids contain areas that are both DGM and analog methods, then once the DGM is completed for that grid the data interpreter will digitize the boundary where DGM was not performed. These points will be given to the reacquisition crew for flagging during reacquisition operations.

2.6.2.1 Analog Geophysical Methods

MEC dig teams configured for subsurface work will conduct the analog geophysical activities as part of the removal operations in areas designated as "analog" areas. These dig teams will perform "EM and dig" operations using a Minelab, Vallon hand-held metal detectors or GPO approved hand held to detect anomalies to the required depths. Teams will move systematically through each grid sweeping lanes approximately 5 feet wide with the handheld metal detector. Subsurface metallic anomalies will be marked with non-metallic pin flags for later excavation. Once all targets within the grid are flagged, the UXO team will excavate the anomalies. To ensure operator proficiency and quality data is collected an operator instrument proficiency test will be conducted on the hand-held geophysical instruments that will be used for project operations. Additional information regarding the operator proficiency test is contained in Section 5 Geophysical Prove Out Plan.

2.6.2.2 DGM Methods

Following the surface clearance, TtEC will perform a digital geophysical survey over the grids that are less than 40% slope. TtEC will utilize a combination of Leica robotic total station (RTS) and the recently upgraded Metris Constellation (CST) for positioning and a Geonics EM61 MKII Time Domain Electromagnetic Induction (TDEMI) geophysical sensor for detection. The geophysical data collection systems will be deployed in a two-person configuration with one team member carrying the detector and positioning system antenna and the other carrying the equipment electronics package.

The RTS team will survey the relatively open areas in the work sites and adjacent sections devoid of relatively dense vegetation and the CST team will survey areas of the site characterized by dense vegetation. The DGM process is discussed in detail in Section 5 Geophysical Proveout and Section 6 Geophysical Investigation Plan.

2.6.2.3 DGM Data Processing, Data Interpretation and Digsheet Preparation

TtEC geophysicists will process, analyze, and interpret geophysical data collected in the field. Those anomalies that are interpreted as likely MEC will be recorded on dig sheets. Dig sheets indicate the location (x, y, and z coordinates) of each suspected MEC item that must be investigated. Dig sheets are provided to field UXO teams for the reacquisition and removal operations described in the next step.

2.6.2.4 DGM Anomaly Reacquisition

Two-person (minimum) Reacquisition Teams will reacquire anomalies identified during geophysical data analysis. They will accomplish this using the dig sheets and RTS or CST. The Reacquisition Teams will proceed to the recorded location of each anomaly and place a non-metallic pin flag marked with a unique anomaly identification (ID) at the location.

2.6.3 Task 4 – Removal Actions

2.6.3.1 Disposal of Lead Contaminated Soil/ Tire House Removal

Prior to beginning removal of the tire house, one soil sample from the soil within the tires will be collected for every 100 cubic yards of soil and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) lead by GPL Laboratories in Gaithersburg, Maryland. The analysis of the soil will determine if the lead level is above or below regulatory limits. Results below the TCLP Leachate Maximum for lead 5.0 mg/L will be considered non-hazardous. If the TCLP results of the chemical analysis indicate hazardous levels of lead contamination above 5.0 mg/L, all personnel within the area of impact will be outfitted in Level C PPE with HEPA respirators initially and Air monitoring (e.g., mini-RAM) will be performed throughout the removal process. Personnel performing these activities will participate in a medical monitoring program (i.e., for lead) and signs will be posted warning of potential lead contamination to the public. The soil will be transported to Waste Management's Emelle, Alabama facility for stabilization and disposal.

If the TCLP results of the chemical analysis indicate the material is non-hazardous then the PPE may subsequently be downgraded to Level D and the material will be spread throughout the area of the Tire House and left in place.

Materials present at the tire house on Bains Gap Road will be evaluated for MPPEH, certified inert and removed from the site for recycling. TtEC will use heavy equipment to collapse the shooting house by pushing the tires towards the center of the facility in order to minimize the area impacted by the potential lead-contaminated material. UXO Technicians will segregate the tires from the soil at the same time inspecting them for MEC prior to placement in rolloff containers. Once the tires are separated, the technicians will inspect the soil for MEC after which it will be placed in separate lined rolloffs. The tires will be transported off site to an ADEM approved vendor for recycling. Details of the chemical sampling and demolition of the Tire House are contained in the MC Sampling Plan (Appendix E) and the Lead Compliance Plan (Attachment 5 of the APP).

2.6.3.2 Subsurface Clearance

A intrusive team will consist of a Team Leader (UXO Technician III), one UXO Technician II, and two to four UXO Technician I's. All personnel making up the intrusive teams will be qualified IAW Department of Defense Explosive Safety Board Technical Paper 18. They will receive site-specific and/or refresher training in the proper use of detection and location equipment, as appropriate, as well as in proper data collection/documentation and site-specific safety.

The intrusive teams will perform intrusive investigation of pre-selected and marked targets in areas where geophysical mapping was performed. The intrusive teams will ensure a minimum of a 2ft radius is clear around each individual flagged location. The teams will perform EM/Flag and Dig operations in all areas for which DGM could not be effectively employed (slopes greater than 40%) utilizing a Vallon all metals, Minelab, or GPO approved hand held detector to locate anomalies to the required depths.

Teams will carefully excavate anomalies with shovels and hand tools, digging beside the anomalies until sufficient depth is reached (as determined using the detectors) to allow investigation from the side. The teams will continue to excavate until each anomaly is exposed and identified. All anomalies will be positively identified by a minimum of two UXO-qualified personnel. Non-hazardous items will be consolidated in the southwestern corner of each grid for later removal. The sides and bottom of completed excavations will be checked with a handheld geophysical instrument by the UXO Team Leader to verify that the area has been cleared of all items. MEC items will be positively identified, recorded, photographed, and secured for disposal.

2.6.3.3 Backfilling

After the UXO Team Leader verifies that all anomalies have been removed and the UXOQC has completed all QC checks, the excavations outside of roadways will be filled in and hand-compacted to existing grade using the excavated material.

If excavation within paved roadways is required, the paved surface will be backfilled utilizing Structural Fill material (dense grade crushed aggregate, ALDOT Specification 825) after the government QA acceptance of the area has occurred. Excavations will be backfilled in 12 inch lifts and compacted to 95% of the fill's Standard Proctor Density per ASTM D-698 utilizing walk behind plate compactors. The compaction will be tested using a Nuclear Density Meter by a licensed operator. The top 6 inches will be backfilled with compacted ALDOT #67 crushed stone. The pavement will be patched and returned to like operating status as the paved road. The material excavated from the road will be collected and disposed of in the Calhoun County Landfill.

2.6.3.4 MEC Identification

Only trained UXO personnel will make MEC identification and characterization IAW EP 385-1-95a, Basic Concepts and Safety Considerations for UXO Operations. Identification will be made based on personal experience and by using appropriate ordnance publications. The SUXOS will verify the identification of all MEC items. In the event site personnel are unable to identify a suspect MEC item, the SUXOS will request assistance from the OE Safety Specialist. If site personnel are not able to fully identify a suspect MEC, the item will be photographed with a digital camera and the photograph will be electronically transmitted to USAESCH for assistance. The item(s) will be placed under 24-hour guard until identification has been verified or other instructions are received from the OE Safety Specialist. Alternative security measures may be employed with the approval of the OE Safety Specialist.

2.6.3.5 Reporting and Disposition of MEC

The SUXOS will prepare and maintain a detailed accounting of activities performed within each work grid including the number, type and condition of MEC found. Information will be summarized for the PM daily in the form of a Daily Operations Report (Appendix F). Data for this report will come from the field log books maintained on site and electronic data collection and storage forms. The electronic forms will be loaded on a electronic data collector used by the field teams and the SUXOS to record essential data in real time. The data collectors will be loaded with an Intrusive Investigation Data/MEC Accountability Form, an MEC Tracking Log and an Explosive Disposal Log, as well as other forms necessary to document the site work. At a minimum the following data items will be recorded:

- The date, grid location, and start/finish times of the anomaly reacquisition/investigation and disposal;
- The depth, orientation, inclination, description, dimensions, estimated weight, and photograph number of anomalies investigated;
- The type(s) and amounts of donor explosives used;
- The location, number, type, and description of MEC and explosive MC items encountered; and
- An estimated weight, in pounds, of the non-explosive MC and MD items removed from the grid.

Digital photographs of all recovered MEC will be incorporated into the MS Access project database. This information will also be presented in the SSFR.

2.6.3.6 MEC Disposal

The preferred method for disposing of MEC/UXO will be consolidation and demolition or BIP if the item is determined unacceptable to move. If the SUXOS with concurrence from the OE Safety Specialist determines that an MEC item is suitable for limited movement, it may be consolidated with other MEC items for more cost-effective disposal. MEC items not acceptable to move will not be moved and will be blown in place. Donor explosives will be used to sympathetically detonate the main charge of the item. When an adequate separation distance is not available, engineering controls will be instituted to allow the detonation disposal process to proceed. TtEC anticipates conducting disposal operations on an as-needed basis and will notify the OE Safety Specialist in advance of each day's planned operations.

Disposal operations will be conducted under the supervision and control of the SUXOS who will be charged with the control of all firing devices. The responsibility for preparation, placement, and firing of demolition charges will not be divided. A minimum of three UXO Technicians will be used in conducting explosive disposal operations. The Disposal Team Leader will be in charge of all team personnel and disposal operations. The UXOSO will observe all disposal procedures. The SUXOS will be at the exclusion zone boundary and will observe all demolition operations while the demolition team performs the demolition set up. The UXOSO/QC will ensure all work within the range or exclusion zone is performed IAW the approved Work Plan. Specific procedures for disposal are contained in Appendix I. No disposal operations will be conducted until an appropriate exclusion zone has been established based upon the munition with the greatest fragmentation distance (MGFD) anticipated to be present on site. The MGFD for this project is the 81mm HE M43 for the 81mm Range and for Range 20; the 155mm HE M107 for Range 24A; and the 81mm HE M43 for the Bains Gap Road area.. The minimum separation distances (MSDs) for intentional and unintentional detonations and the team separation distances are dependent on which of the designated areas teams are working within and are detailed in Chapter 4.

2.6.3.7 Engineering Controls

TtEC will identify and recommend engineering controls (ECs) as required to maintain the appropriate level of safety at this site. Engineering controls may include, but are not limited to, temporary vehicle barriers, sandbags, and ecology blocks.

2.6.3.8 Disposition/Disposal of MPPEH

Procedures used for field collection, segregation, and inspection of Materials Potentially Presenting an Explosive Hazard (MPPEH) for this project will follow the guidance in EM1110-1-4009 (June 2007) and TtEC SOP 5 Management and Disposition for MPPEH (Appendix I) for the proper management and disposition of MPPEH. MPPEH will be checked by three separate qualified inspectors: the UXO Tech III and II in the field, and the SUXOS before final certification in the secure storage area. The UXOQC will also conduct a 10% inspection on the material to verify the process is conforming to requirements. During clearance operations, the field team will locate, identify and conduct the initial inspection of the MPPEH, Once inspected the material will be designated as MPPEH, Munition Debris (MD), Range Debris (RD), or Cultural Debris (CD). Material designated as MPPEH will require to be explosively vented or countercharged on site to eliminate the potential explosive hazard. MD, RD, and CD will be painted with white spray paint and then removed from the work areas using pick-up trucks and transported daily to a designated secure storage area.

2.6.3.9 Segregation and Storage

After the MD, RD, or CD have been initially inspected/painted by the UXO teams, the collected materials will be moved via pick-up trucks and trailers as necessary to a designated secure storage area. The material will be further inspected, segregated, and certified prior to release to a qualified receiver. The storage area will be organized to permit fast and accurate inspection/segregation of materials. Rolloff containers, drums, and an all terrain forklift (as necessary) will be pre-positioned in the processing area to facilitate munitions, range-related, and cultural debris inspection/segregation. RD, MD and CD will be segregated and placed in separate drums or bins. At the storage area, the SUXOS will conduct a 100% certification inspection and UXOQC will inspect 10% of the material to verify the process is conforming to requirements. After the items have been inspected and are certified free of explosives they will be stored in separate, lockable rolloff containers.

2.6.3.10 Scrap Disposal

Once all items have been sorted, segregated, and inspected, the rolloff containers will be sealed with a unique identifying numbered witness seal. The SUXOS will be the Certifying Official on the DD Form 1348-1A Certification Form, and the UXOQC will verify that the entries on the DD Form 1348-1A are correct. Once all forms have been verified, the rolloff containers will be turned over to a qualified recycling facility for final disposal. A copy of the DD Form 1348-1A will accompany the shipment.

Upon receiving the unopened labeled containers, each with its unique identified and unbroken seal ensuring a continued chain of custody, the qualified recycler will review the DD Form 1348-1A to check that the security number matches the label number. After ensuring the numbers match and the container arrived with the seal unbroken, the recycler will sign the DD 1348-1A and fax the signed copy to TtEC for documentation and validation that chain of custody was maintained.

As per EM 1110-1-4009, 15 June 2007, the recycler will also provide TtEC with a memorandum on company letterhead stating that the contents of the containers will not be sold, traded, or otherwise given to another party until the contents have been destroyed and are only identifiable by their basic content. Documentation will be included in the final report.

2.6.3.11 Purchase, Receipt, Transport and Storage of Explosives

The SUXOS is responsible for explosives receipt, transport, storage and accountability. He is responsible for planning, directing and executing all explosive disposal operations and ensuring the safety of all personnel. Procedures for explosives purchase, receipt, transport, storage and accountability are discussed in Chapter 3, Explosives Management Plan and specific procedures are contained in Appendix I.. The explosive safety requirements and criteria pertaining to the storage, handling and transportation of explosives, are contained in DOD 6055.9-STD, DA Pam 385-64, and Engineer Pamphlet (EP) 385-1-95a and will be followed as a minimum.

2.6.4 Task 5 – Geospatial Data

TtEC will update and maintain the existing GIS database in accordance with DID MR-005-07.01. A geospatial data analysis will be performed using the GIS and the pertinent information will be submitted to USAESCH. This may include GIS layers relating to cultural, environmental, biological, socioeconomic, and/or infrastructure variables. The database will be a living repository that is continuously updated and refined throughout the project. TtEC will submit GIS data in a format compatible to the Environmental Systems Research Institute, Inc. (ESRI) (ArcView/ArcInfo) system, version 9.x (Shapefiles). The data will incorporate layers that overlay on maps of the site that identify physical, cultural, biological and ordnance related items found during the investigation. TtEC will provide all submittals in the Alabama State Plane East FIPS 0101, NAD83 Projection coordinate system and with all information stipulated in the PWS.

2.6.5 Task 6 – Site Specific Final Report

TtEC will prepare and submit a Site Specific Final Report (SSFR) in accordance with DID MR-030 , the requirements of the Consent Order, and PWS no later than 21 days after completion of field activities for the applicable time period as designated by the Contracting Officer. TtEC will prepare and submit draft and final versions of each SSFR. We will utilize the GIS to produce visual aids (e.g., maps, diagrams) for the report that will allow quick and easy evaluation of our results without detailed review of the text. WE will also structure tables to clearly display and compare data, as appropriate to convey the results of our work.

2.6.5.1 Meetings

The TtEC Project Manager, Don Welch, will attend each of five meetings at Fort McClellan to present briefings related to the Charlie Area Remedial Action. Art Holcomb, who has attended numerous RAB and public meetings will support Don in this effort and ensure that Don and other TtEC technical experts and staff attending these meetings are prepared to answer questions posed by attendees during these meetings. The TtEC project team will prepare handouts or other presentation such as slides for distribution to the meeting attendees in the interest of ensuring comprehensive briefing and awareness if necessary. Briefing materials will be submitted to USAESCH for approval prior to presenting to the stakeholders.

2.6.5.2 Additional Meetings (Optional)

The TtEC Project Manager will be available to attend additional optional meetings at Fort McClellan as requested by the USAESCH.

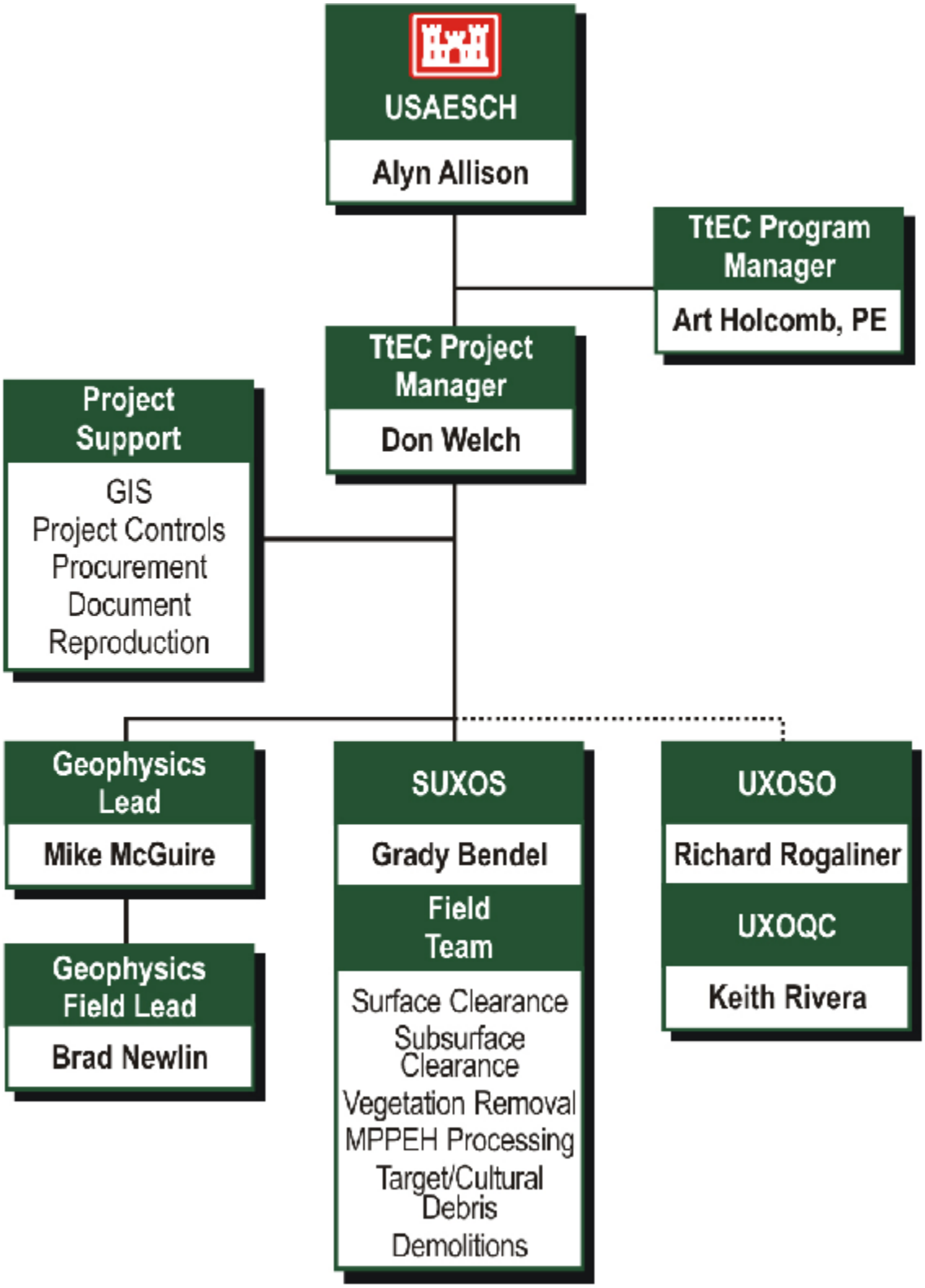
2.6.6 Procedures for Changed Site Conditions

If site conditions change from the assumptions upon which this work plan is based, the TtEC PM will immediately notify the assigned OE Safety Specialist, the USAESCH Project Manager, and USAESCH Contracting Officer (CO). Changes in site conditions that have the potential to adversely affect the project will be brought to the attention of these persons as soon as they are recognized. Any change to the project requiring an amendment to the Work Plan, an amendment to the ESS, additional authorization, or changes to the schedule will be coordinated through the TtEC PM, the USAESCH PM and the CO. Field Change Requests (FCRs) will be prepared and implemented following the procedures outlined in Chapter 10 Changes to Existing Documents and Field Change Requests. A example of the FCR is contained in Appendix F.

2.6.7 Project Organization

The project organization consists of the Government representatives, i.e., the USAESCH Project Manager (Allyn Allison), and the USAESCH OE Safety Specialist (TBD), and the TtEC project team. Figure 2-1 depicts the Charlie Area TtEC project team.

Figure 2-1. Charlie Area Project Task Organization



2.6.7.1 Personnel Qualifications

Personnel qualifications will be IAW DDESB TP-18. Certificates are maintained on file at TtEC's corporate office and duplicates will be maintained on site. Resumes of key personnel are included in Appendix H.

2.6.7.2 Team Composition

Table 2-1 describes the teams which will execute this work. The TtEC PM and SUXOS may tailor the number of teams, team composition and team duties as necessary in order to perform the work safely and efficiently.

Table 2-1 Charlie Area Field Teams

Team	Number of Teams	Composition (*Number per Team*)
Survey/Grid Setout	1	(1) Surveyor (1) UXO II
Brush Cutting Escort	2	(1) UXO III/II
Visual Sweep/Surface Clarence	2	(1) UXO III (1) UXO II (4-6) UXO1/ Sweep Personnel
Geophysics (GPO and DGM)	2	(1) Site Geophysicist Data Collection Teams (3) UXO III/II/I/* (*Any Combination of UXO Techs)
Geophysics/ Reacquire (GPO and DGM)	1	(1) Site Geophysicist Target Reacquisition Teams (1) UXO II (1) UXO III/II/I/* (*Any Combination of UXO Techs)
MEC Intrusive/AGM	2	1 UXO III (1) UXO II (2-4) UXO I (Surface Clearance Team with exception of Sweep Personnel will be the MEC Intrusive/AGM team. Team members must process through GPO IAW section 5.12 of the WP)
Anomaly Resolution	1	(1) UXOQC (1) QC Geophysicist (1) UXO III/II/I/* (*Any Combination of UXO Techs)
MPPEH Processing Team	1	(1) UXO III (1) UXO II/1 (Personnel may be shifted over from Intrusive Teams)

2.6.8 Personnel Responsibilities

The following paragraphs describe the specific responsibilities associated with the TtEC personnel shown in Figure 2-1 and UXO qualified personnel listed in Table 2-1. All personnel who will be assigned to this project are qualified for their assigned positions and, where applicable, meet the USAESCH training and experience requirements IAW DDESB TP-18. The key personnel will be supported by technical resources throughout the TtEC organization on an as-needed basis.

2.6.8.1 Project Manager (PM)

The TtEC PM is responsible for the overall execution of all work assigned under this task order and the management of all TtEC resources needed for the successful implementation of site operations. The PM is the single Point of Contact (POC) with USAESCH and is responsible for quality, schedule, and cost performance.

2.6.8.2 Corporate UXO Safety Manager (Project Environmental and Safety Manager [PESM])

The PESM is the TtEC employee assigned to assist the PM in the development of the Accident Prevention Plan (APP) (Appendix D) and in the implementation of the TtEC corporate environmental and safety programs. The PESM has approval authority for corporate environmental and safety issues and assumes a key person role for the project. PESM duties include reviewing the APP, performing specific tasks IAW the APP, ensuring TtEC employees and subcontractors receive required training IAW the APP, conducting inspections, and acting as a technical resource for all environmental compliance, safety, loss control and industrial hygiene issues.

2.6.8.3 Corporate UXO Quality Manager

The UXO Quality Manager develops, maintains, and manages the TtEC UXO Quality Control program. The UXO Quality Manager reviews and approves UXO project quality control plans and conducts QC audits.

2.6.8.4 Senior UXO Supervisor (SUXOS)

The SUXOS assists the PM in the development of plans, identification of personnel and equipment requirements, and supervision of all daily activities of the field teams. The SUXOS is also responsible for overall coordination of on-site activities, for explosives receipt, storage and accountability, and for keeping the PM informed of staffing, resource or other issues that could impact the overall performance under this task. He is also responsible for initial and follow-on site specific project and safety training with assistance from the UXOSO.

2.6.8.5 UXO Safety Officer (UXOSO)

The UXOSO will implement the APP, provide on-site training, and recommend personal protective equipment (PPE) level changes to the PESM as site conditions warrant. The UXOSO will be responsible for the evaluation and analysis of potential safety problems, implementing safety-related corrective actions, and maintaining the daily safety logs. He will have stop work authority for unsafe conditions and will coordinate with the SUXOS to ensure all site safety considerations are enforced. The UXOSO reports to the TtEC PESM. For a more detailed description of UXOSO responsibilities, refer to the APP (Appendix D).

2.6.8.6 UXO Quality Control Specialist (UXOQC)

The UXOQC will implement the project QC Plan (Chapter 10.0), complete QC Inspection reports and conduct QC audits. He will report to the TtEC UXO QC Program Manager, and will coordinate all QC activities with the TtEC PM and SUXOS at least once each day.

2.6.8.7 UXO Technician III

The UXO Technician III supervises teams conducting MEC related activities and also acts as the Demolition Supervisor for all explosive operations. The UXO Technician III will be responsible for training all personnel regarding the nature of the materials handled, the hazards involved, and the necessary precautions, and will be present during all on-site disposal operations. The UXO Technician III will also maintain custody of the blasting machine or Fuze igniters during demo operations. The UXO Technician III will report directly to the SUXOS.

2.6.8.8 UXO Technician II

The UXO Technician II locates UXO, operates equipment, conducts UXO procedures, and escorts non-UXO personnel around the site as directed by the UXO Technician III. UXO Technician II functions as a member of the demolition team as required and reports to the assigned UXO Technician III.

2.6.8.9 UXO Technician I

The UXO Technician I assists other UXO qualified personnel (UXO Technician II and higher) and reports to the assigned UXO Technician III.

2.6.8.10 Sweep Personnel

UXOSP assist UXO qualified personnel in the performance of UXO-related operations. UXOSP are not involved in the execution of explosives operations and shall not have intentional physical contact with MEC. With direction and supervision of UXO-qualified personnel, UXOSP may:

- Conduct visual and/or detector-aided UXO and discarded military munitions (DMM) field search activities and locate subsurface UXO and DMM
- Perform field maintenance and calibration checks on geophysical detection instruments and related equipment.
- Remove non-hazardous munitions debris and range-related debris, only after such items have been inspected by a UXO technician or UXO qualified personnel and determined to be safe for handling.
- Perform site/area security functions.

2.6.8.11 Geophysicists

The Project Geophysicist is responsible for preparation of chapters of the Work Plan that address geophysical investigations and geophysical QC. He is also responsible for the overall implementation of these plans, geophysical QC, and data analysis. Additionally, the Project Geophysicist will interface with site geophysicists for data evaluation, and interface with the GIS Manager for incorporation of geophysical data into the GIS. Site Geophysicists are responsible for providing target anomaly dig sheets to the UXO teams and coordinating QC efforts with the UXO teams during the intrusive investigation.

2.6.9 Functional Roles of Organizational Entities

The functional roles of the organizational entities that will be involved during the execution of this project are described below:

- U.S. Army Engineering and Support Center, Huntsville (USAESCH) – Serves as the USAESCH District Project Manager for the Fort McClellan site. Coordinates real estate access for site activities, and coordinates public affairs issues. Interfaces with the customer and provides funding. Also serves as the USAESCH Project Manager for conducting the removal action. Reviews and approves plans and reports prepared for the removal action. Coordinates Government support to the UXO Contractor.
- TtEC – Serves as the UXO contractor conducting the removal action. Prepares plans and implements field investigation activities for the removal action. Provides manpower and equipment to conduct removal action in designated areas. Prepares the final Removal Report. Provides administrative support and reporting as required by USAESCH.

2.7 MOBILIZATION

TtEC will schedule the arrival of the work force in a manner that is most effective and designed to allow for immediate productivity. The baseline schedule is provided in Section 8.0. All TtEC and subcontractor personnel mobilized to the site will meet Occupational Safety and Health Administration (OSHA) hazardous waste operations training and medical surveillance requirements as specified in the APP. As part of the mobilization process, TtEC will perform site-specific training for all on-site personnel assigned to this project. The purpose of this training is to ensure all on-site personnel fully understand the operational procedures and methods to be used by TtEC, to include individual duties and responsibilities, and all safety and environmental concerns associated with operations. Any personnel arriving at the site after this initial training session will be trained as they arrive. Training will be conducted by the SUXOS and the UXOSO, and will include the topics identified below:

- Field equipment operation, to include the safety and health precautions and field inspection and maintenance procedures that will be used;
- Relevant Chapters of this Work Plan and the APP, as they relate to the tasks being performed;
- Site-, task-, and hazard-specific training to ensure personnel are aware of potential site and operational hazards;
- Public relations training, to ensure personnel will not make any public statements to the media;
- Environmental concerns and sensitivity, to include endangered/threatened species and historic, archeological and cultural (HARC) issues;
- Additional OSHA or USAESCH required training, listed in the APP;
- MEC refresher training designed to address the ordnance that may be encountered on-site, including identification features, hazards, and disposal methods; and
- White Phosphorus (WP) first aid training.

2.7.1 Field Office Set-Up

TtEC will use on-site existing office space for our field office, located in building 215 on Jimmy Parks Boulevard, and a scrap yard. Both of these were used by TtEC for previous projects at Fort McClellan and are more than suitable.

2.7.1.1 - The TtEC PM and SUXOS will coordinate the following in preparation for field activities:

- Equipment rentals - Vehicles to transport personnel and/or equipment;
- Permits - No construction or explosive storage permits are required for this project; however, the SUXOS will coordinate with Calhoun County emergency service agencies regarding operations, including scheduling of planned disposal activities;
- Sanitation - Portable toilets and hand washing facilities will be positioned at the project site.
- Cell Telephones and Local Radio Net – Hard telephone lines are available at the project office. Cellular phones will be used for communications and as a means of obtaining emergency

services. The TtEC PM will also set up a redundant communications system for emergency and administrative communication; and

- Shipping and Mail – Local shipping and mailing addresses and procedures will be established by the SUXOS in general proximity to lodging and/or the work site.

2.7.2 Field Equipment and Support

The TtEC PM and SUXOS will provide from the TtEC warehouse, lease, rent or purchase from local stores, any and all supplies and equipment necessary for personnel to perform the MEC removal action. Project equipment and supplies will come from local vendors, subcontractors, and local leases/purchases who successfully met our needs for past work at Fort McClellan. All equipment, regardless of source, will be checked to ensure its completeness and operational readiness. Any equipment found damaged or defective will be returned to the point of origin and a replacement will be secured. All instruments and equipment that require routine maintenance and/or calibration will be checked initially upon arrival and then prior to use each day. This system of checks ensures the equipment is functioning properly. If an equipment check indicates that any piece of equipment is not operating correctly, and field repair cannot be made, the equipment will be tagged and removed from service and a request for replacement equipment will be placed immediately. Replacement equipment will meet the same specifications for accuracy and precision as the equipment removed from service. All vehicles will receive a documented initial inspection along with pictures of the vehicle taken. All vehicles will be inspected weekly with the exception of the explosive vehicle which will be inspected daily.

2.7.3 Local Coordination

During mobilization, the Project Manager, SUXOS, UXOQC and UXOSO will coordinate with local personnel services and agencies to ensure the availability of resources that may be needed during the course of the project. At a minimum, contact and coordination will be made with the following entities:

- USAESCH Technical Manager, CO, the USAESCH PM, and the USAESCH Safety Specialist to reconfirm priorities/schedules, and to identify any changes in the Scope of Work;
- Calhoun County fire and law enforcement agencies.;
- Local Vendors and Suppliers; and
- Emergency Medical Facilities. Local points of contract are included in Appendix C. Emergency contacts and telephone numbers are included in Appendix D (APP).

3.0 EXPLOSIVES MANAGEMENT PLAN

3.1 GENERAL

This Explosives Management Plan is prepared for execution of the removal action at the selected sites within the Charlie Area IAW DID-MR-005-03, Federal Acquisition Regulation (FAR) 45.5, ATFP 5400.7, DoD 6055.9-STD, Army Regulation (AR) 190-11, DOT Regulations, and Alabama Explosive Safety Act of 1993. The demolition explosives used for the disposal of the discovered MEC/UXO will be delivered to, and stored in, a sited explosive location at Fort McClellan. TtEC will site two magazines within USFWS property. The magazines will meet and be maintained in accordance with all the requirements of DOD 6055.9-STD, AR 190-11, and ATFP 5400.7, and EP 1110-1-18. TtEC will ensure that explosives procured for these operations comply with DA Pam 385-64 for storage configuration and compatibility and are in appropriate U.S. Department of Transportation (DOT) Packaging. Donor explosives will be transported to the storage site by authorized TtEC personnel as needed. TtEC will comply with DA Pam 385-64 for safe movement of explosives at Fort McClellan. Specific procedures for Purchase Receipt Accountability of Explosives, Storage of Explosives, and Transport of Explosives are contained in Appendix I.

3.2 LICENSES AND PERMITS

A copy of the following licenses and permits will be maintained on site by the SUXOS and will be made available, upon request, to any Federal, State or local authority:

- Certification of Permit, List of Representatives/Agents Authorized to Order Explosive Materials, and Statement of Intended Use; and
- Copy of TtEC Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE). Manufacturer of High Explosives License, 9-WA-033-20-6F-00135.

3.2.1 Notification to Fire Departments

The SUXOS will also notify the authority having jurisdiction for fire safety (Anniston Fire Department (256) 231-7644).

3.3 ACQUISITION

All required preparations for storage of explosives must be made prior to ordering the explosives. The requirements of the TtEC Procedure, Storage of Explosive Materials, and all applicable state, federal and military/DoD Regulations will be met prior to taking possession of the explosives on the project site or at a designated storage magazine.

The Project Manager will ensure that executed copies of a current Certification of Permit, List of Representatives/Agents Authorized to Order Explosive Materials and Statement of Intended Use are submitted to the responsible TtEC procurement official along with the purchase request for explosives.

3.3.1 Estimated Explosives

The following is the list of explosives and the estimated quantities that TtEC will purchase for this removal action. Explosives will be replenished based on rate of use. No more than 100 pounds NEW demolition explosives (HD 1.1 and HD 1.4) will be stored in the magazine at any time.

- 1 lb. Cast Booster – TNT and PETN — 40 each
- Detonating Cord, 80 grain — 500 feet
- Jet Perforators, 32 gram shape charge, RDX — 50 each
- NONEL- Lead-in Line — 5,000 feet
- NONEL- Blasting Caps with 16 foot leads — 30 each
- Flexible Linear Shape Charge, 250 gpf — 100 feet

3.3.2 Acquisition Sources

TtEC will obtain quotes from three vendors for explosives and associated supplies and will acquire explosives through the local authorized commercial vendor that affords the best value to the Government. Proposed vendors are:

- Birmingham Powder
- Dyno Nobel, and
- JRC

3.4 INITIAL RECEIPT

The Project SUXOS (Licensed Alabama Blaster) will be responsible for the initial receipt of all explosive materials. Upon receipt, the SUXOS will document the actions taken for inventory. The SUXOS will designate a UXO Technician III as the Demolition Supervisor (DS). The DS will be accountable for all explosive documentation including receipt of explosives, expenditures and returns (if any). The DS will inventory and maintain all documentation concerning the demolition material upon receipt. By signing a receipt document he assumes custody of and accountability for the explosive materials.

3.5 ACCOUNTABILITY

3.5.1 Explosive Inventories

The SUXOS and another designated UXO technician will perform a physical inventory of the stored explosives to reconcile the actual quantities with the quantities listed on the Explosives Accountability Record forms and all other explosive inventory records. Any discrepancies noted during any inventory will be brought to the attention of the PM immediately. The SUXOS will initiate an audit immediately to determine if any explosives are lost, stolen or have been used without authorization. Also the following inventories will be taken as needed:

- Initial receipt of explosives.
- Weekly Inventories
- At the time of discontinuing operations.
- Change of responsible SUXOS.

- At any other time the SUXOS or PM may require.

All inventory actions will be annotated on the Explosives Accountability Records and inventories will be prepared in duplicate. The original will be maintained by the SUXOS on-site and the copy sent to the PM.

3.5.1.1 Initial Receipt Inventories

Upon initial receipt of explosives, a complete inventory will be conducted with the following information for each type of explosive recorded on the TtEC Explosives Accountability Record form in Appendix F.

- Date of acquisition;
- Name or brand name of manufacturer;
- Manufacturer's marks of identification;
- Quantity (applicable quantity units, such as pounds of explosives, number of detonators, etc);
- Description (e.g., dynamite, C4, shape charges, perforators, etc.);
- Name, address, and license number of the person from whom the explosive materials were received; and
- The UXOQC will initiate QC checks (per Chapter 10.0).

3.5.1.1.1 Reconciling Discrepancies in Quantities

Before signing for explosives, the SUXOS will conduct a 100% inventory. The quantities annotated on the receipt document or Bill of Lading must agree with those counted in the 100% inventory. If these quantities do not match, the SUXOS will contact the vendor, advise him of the discrepancy, and what actions he intends to take. The SUXOS will only sign for the quantity of explosives actually received. Actual quantities received must be indicated on all copies of the shipping documents prior to signing.

3.5.1.2 Weekly Inventories

The primary representative/agent or alternate will conduct a physical inventory of all explosive stocks on a weekly basis. The originals will be maintained in the project files at the site until completion of explosive operations when it will be forwarded to the UXO Operations Manager for inclusion in TtEC's ATFE Central files. This inventory must be conducted no later than the last business day of the week. The representative will be accompanied by an alternate and the same representative will not sign the inventory on consecutive weeks.

3.5.1.3 Change of Primary Representative/Agent

Upon a change of the primary and/or the alternate representative/agent a complete inventory of all explosive material will be conducted jointly by the outgoing and incoming representative/agent. The results of the inventory will be forwarded to UXO Operations Manager within five (5) working days after the inventory is conducted.

3.5.1.4 Closeout Inventory

Upon completion of all explosive operations, where all explosives have been used or returned to the supplier, a closeout inventory (see Attachment 3 of SOP2 located in Appendix I) will be conducted and recorded in the same manner as the Initial Receipt Inventory described above. The primary representative/agent will send the original Closeout Inventory, a copy of all magazine inventory cards and explosive purchase orders to the UXO Operations Manager for maintenance in TtEC's ATFE Central files.

3.6 RECORDKEEPING

3.6.1 Central Files

Copies of all correspondence, certifications, invoices and current inventories will be maintained at the project site by the Senior UXO Supervisor. Copies of all correspondence and certifications will be maintained by the UXO Operations Manager. At the completion of each munitions response, original documents related to explosive operations, inventories, invoices and accountability will be transferred to the UXO Operations Manager. Copies of these documents will be maintained in the project files. These files must be maintained for a minimum of 5 years per 27 CFR 555.121.

3.6.2 Expenditure/Receipt Accountability

A dual system of transaction accountability will be maintained. Two sets of Magazine Inventory Cards will be used for each type, size and manufacturer of an explosive item. One copy of the Magazine Inventory Card will remain in the magazine with the explosive items. The second card will be kept in a project Log Book by the Senior UXO Supervisor in the site office. The Magazine Inventory Cards will identify the item by name, date code, type and size and maintain a running balance (date of transaction, gain, loss and balance), with signature accountability for all issues. The magazine cards will remain on-site until demobilization or when all explosives are expended. The primary representative/agent will then forward the original magazine cards with the closeout inventory to the UXO Operations Manager where they will be maintained in the TtEC's ATFE Central files.

3.7 STORAGE

3.7.1 Establishing Explosives Storage Facilities

Two existing ATF-approved Type II, two compartment, portable magazine are being provided by the Government and are to be moved by TtEC from their current location adjacent to Range 20 to a new site adjacent to the Stump Dump. These Type II Explosive Storage Magazines will be used for storage of approved explosives and initiating materials. For discussion of storage limits and magazine separation distances, see Chapter 4.0 Explosives Siting Plan.

TtEC will erect security fencing around the Explosive Storage Facilities for security risk category II ammunition in accordance with AR 190-11.

3.7.2 Physical Security of Explosive Storage Facilities

The SUXOS will maintain the keys to the magazines in accordance with ATF guidelines. Access to the magazine will be controlled by the SUXOS and limited to TtEC personnel who are necessary to conduct demolition operations. The SUXOS will report the names of the TtEC personnel permitted access to the magazines to the OE Safety Specialist. The SUXOS will issue explosive material to the DS for required demolition operations.

3.8 TRANSPORTATION

Transportation of explosives is anticipated to consist of limited movement of explosive materials for the delivery point on site to the actual BIP sites. The following general procedures apply to this process and will be applicable if transport to and from the magazine.

3.8.1 Procedures

3.8.1.1 Safety

Safety is always the primary consideration during explosives transportation operations. TtEC will ensure that all site personnel, the public, and the environment is protected at all times from the effects of blast, fire, fragmentation and toxic releases.

3.8.1.2 Vehicle Operators

Explosives vehicle operators will be TtEC employees who have valid Commercial Driving Licenses and are trained to accommodate the hazards inherent in transporting explosives. TtEC will observe all U.S. DOT and State of Alabama requirements. TtEC will designate the explosive vehicle operators in writing.

3.8.1.3 Responsibilities

TtEC employees will segregate the explosives identified for transport by type and only load into vehicles meeting the regulations of 49 CFR, and applicable state laws. The SUXOS will provide oversight during loading. TtEC personnel will block, brace and transport the explosives to the demolition-site. Prior to movement, the driver will inspect the explosives transport vehicle to ensure the load is properly secured. Detonators and high explosives will remain separated at all times. This will be accomplished by using separate vehicles or placing the detonators in a specially designed container such as an Mk 663 or IME 22 container. Explosives will not be transported in the cab of the vehicle. Explosives laden vehicles will not be left unattended. No person is permitted to ride on or in the cargo compartment. Explosive materials will not be transported through any prohibited tunnel or subway or over any prohibited bridge, roadway or elevated highway. No person will smoke or carry a lighted cigarette, cigar or pipe within 25 feet of a motor vehicle that contains explosives, oxidizing materials or flammable materials. No one will drive, load, or unload a motor vehicle transporting explosive materials in a careless or reckless manner. Explosive materials will not be carried or transported in or on a public conveyance and will not be transferred from one motor vehicle to another on any public road without informing the fire and police departments involved. In the event of a breakdown or collision, the local fire and police departments will be promptly notified on the location and type of cargo. Explosive materials will be transferred from the disabled vehicle to another vehicle under proper and qualified supervision. Only authorized persons will be permitted on a motor vehicle transporting explosive materials.

3.8.2 Vehicle Requirements

3.8.2.1 Safety Considerations

Vehicles used for the transportation of explosives will be suitable to carry the load and be in good mechanical condition. The transportation of explosive materials in open-bodied vehicles, which depend on a fire resistant tarpaulin cover for protection, is not permitted. When a vehicle with an open body transports explosive materials, the explosives will be loaded into a portable magazine or closed metal container securely fastened to the truck bed. All vehicles used for the transportation of explosive materials will have tight wood floors. Any exposed spark-producing metal on the inside of the body, portable magazine, or closed container, will be covered with wood or other non-sparking material to prevent contact with the explosive materials. Exposed spark-producing metal need not be covered in a vehicle transporting only blasting agents.

3.8.2.2 Fire Extinguishers

Each vehicle transporting explosive materials will be equipped with fire extinguishers as follows:

- Trucks of less than 14,000 lbs. Gross Vehicle Weight (GVW) rating: Minimum of 2 extinguishers with a total fire extinguisher rating of at least 4-A: 20-B: C.
- Trucks over 14,000 lbs. GVW rating and tractor semi-trailer units: Two or more extinguishers with a total fire extinguisher rating of at least 4-A: 70-B: C.
- Only fire extinguishers listed or approved by a nationally recognized fire equipment-testing

laboratory will be used on vehicles carrying explosive materials. The extinguishers should be designed, constructed and maintained to permit visual determination of whether or not they are fully charged.

- Extinguishers will be located where they will be accessible for immediate use.
- Extinguishers will be examined and recharged periodically IAW the manufacturer recommendations.
- Where trucks are operated in temperatures below 0 degrees F, dry powder extinguishers should be pressurized with nitrogen gas.

3.8.2.3 Vehicle Inspections

A motor vehicle used for transporting explosive materials will be inspected each day before use to determine it is in proper condition for the safe transportation of explosives, including:

- The fire extinguishers are fully charged and ready for use.
- All electrical wiring is protected and fastened to prevent short-circuiting.
- Chassis, motor, pan and underside of body are reasonably clean and free of excess oil and grease.
- Fuel tanks, feed lines and crossover lines are secure and have no leaks.
- Brakes, lights, horns, windshield wipers, defrosters, and steering apparatus are functioning properly.
- Tires have proper inflation and are free of defects.

3.8.2.4 Tires

Tires will be checked for proper inflation and general conditions after each 2 hours of travel or 100 miles, whichever comes first, and at every stop. Flat or overheated tires will be removed from the vehicle immediately. After removal of the tire, it will be kept far enough from the vehicle so that spontaneous ignition of the tire will not endanger the vehicle or it's cargo. This tire will not be placed on the vehicle until it has cooled down below the danger, nor will it be used again until the cause of its overheating has been corrected.

3.8.2.5 Prohibited Cargo

No metal, tools, oils, matches, firearms, electric storage batteries, flammable substances, acids, oxidizing materials or corrosive compounds will be carried on the body of any motor vehicle transporting explosive materials except as permitted by regulations of the U.S. DOT.

3.9 RECEIPT PROCEDURES

3.9.1 SUXOS

The SUXOS will initially receive explosives from a commercial vendor. The SUXOS will issue explosives to the DS and will document this transaction on the Explosives Accountability Record forms. The SUXOS will maintain these Explosives Accountability Record forms and include them in the Final Report.

3.9.2 Authorized Individuals

The TtEC Vice President for Remediation will issue a Certificate of Permit, List of Representatives/Agents Authorized to Order Explosive Materials, and Statement of Intended Use. This certificate will designate those persons who are authorized to receive, store and use explosives on this project. These persons are the SUXOS and the DS. Other personnel such as the UXOQC, the UXOSO and the USAESCH Safety Specialist will be granted access on an escorted basis by the SUXOS to perform their inspection duties.

3.9.3 Certificate of End Use of Explosives

The SUXOS and DS will certify that the amount of explosives used was for the intended purpose. The DS will record the use of the explosives on the Explosive Disposal Log form found in Appendix F.

3.9.4 Procedures for Reconciling Receipt Documents and Proposed Intervals

The SUXOS will issue explosives to the DS UXO Technician III in charge of the UXO disposal. The DS will conduct a 100% inventory of issued explosives upon receipt. The quantities listed on the Explosive Disposal Log will match the quantities reflected on the initial receipt inventory. If these quantities do not agree, the DS will bring this to the immediate attention of the SUXOS.

3.10 LOST, STOLEN OR UNAUTHORIZED USE OF EXPLOSIVES

Upon discovering lost, stolen, attempted break-in, or unauthorized use of explosives, the SUXOS will document the circumstances and immediately notify the following:

- The USAESCH Contracting Officer (Tel: 256-895-1061).
- The USAESCH Safety Specialist (Tel:TBD).
- The USAESCH Project Manager (Tel: 256-895-1121).
- The TtEC Project Manager (Tel: 256-454-4451).
- The TtEC Program Manager (Tel: 256-430-3701).
- The ATFE (Tel: 1-800-800-3855)
- Calhoun County Sheriff (Tel: 256-236-6600)
- Anniston Police Dept (Tel: 256-238-1800)

3.11 RETURN TO STORAGE OF UNEXPENDED EXPLOSIVES

The DS will return any unused explosives to the SUXOS who in turn will return them to their proper magazine and annotate the transaction as a receipt on the Explosives Accountability Record.

3.12 DISPOSITION OF REMAINING EXPLOSIVES AT THE END OF SITE ACTIVITIES

The SUXOS will minimize the amount of explosives in inventory consistent with operational requirements. At the end of operations at Fort McClellan, the PM will make an economic analysis to determine the most cost effective way to manage any remaining explosives. The PM will provide this analysis to the CO for authorization of one of the courses of action. These courses of action could include: 1) Return of the unopened containers to the commercial vendor for credit; 2) Transfer of the explosives to another USAESCH project; or 3) Transfer of explosives to the CO for subsequent use at Fort McClellan.

3.13 FORMS

The Explosives Accountability Record form and the Explosive Disposal Log form are located in Appendix F.

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4.0 EXPLOSIVES SITING PLAN

This Explosives Siting Plan is prepared to support the removal action at Fort McClellan authorized by Contract W912DY-04-D-0011, Delivery Order 0010 IAW DID MR-005-04. This Explosive Siting Plan describes the safety criteria applicable to the siting of explosives operations at Fort McClellan. Specific procedures for Storage of Explosives are contained in Appendix I.

4.1 EXPLOSIVES STORAGE MAGAZINES

4.1.1 Magazines

TtEC will use two existing government provided ATF-approved Type II, single compartment, portable magazine for storage of approved explosives and initiating materials. These magazines will be moved by TtEC from their current location adjacent to Range 20 to a new site adjacent to the Stump Dump. The SUXOS and UXOQC will verify the physical condition of the magazines used, that they are grounded, and that the magazines are properly located IAW Section 55.206 of ATFEP 5400.7 and DOD 6055.9-STD regulations, respectively. Lightning protection for the explosives storage containers will consist of copper grounding rods on diagonal corners of the magazines. The magazines will be setup and tested IAW DA Pam 385-64.

4.1.2 Store Detonators Separately

The hazard division of the explosives stored in these magazines will be 1.1. Detonators may not be stored with any other high explosives. Since hazard division 1.1 is high explosives, the detonators must be stored in one of the magazines separately from the hazard division 1.1 explosives.

4.1.3 Minimum Distances

Per DOD 6055.9-STD, for a magazine to store up to 100 lbs. Net Explosive Weight (NEW), it must be at least:

- 658 feet from inhabited buildings (Table C9.T1, Note 2, 5 July 2000) and 395 feet from public traffic routes (Table C9.T1, Notes 3 and 7, 27 January 2000).
- 51 feet between magazines (Table C9.T5 for K=11, NEW =100 pounds, July 1999).

The Magazine Siting Map for Fort McClellan is provided in Figure 4-1.

4.1.4 Magazine Siting

The distance to the closest inhabited building exceeds 658 feet and the distance to the closest public traffic route exceeds 395 feet. Therefore, the proposed locations for siting of the magazines to hold up to 100 pounds NEW meets the requirements of DOD 6055.9-STD.

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4.2 ORDNANCE AND EXPLOSIVE AREAS

4.2.1 Minimum Separation Distance (MSD)

The MSD for non-essential personnel during MEC/UXO operations for each designated area within the Charlie Area of Fort McClellan is based on the MGFD expected in that area or for that process. These are the largest types of MEC/UXO item (type with the largest quantity of explosive filler) that can reasonably be expected to be present at each of the designated sites. Fragmentation data for these items is provided from the Department of Defense Explosive Safety Board (DDESB) fragmentation database and from Table B-2 in Technical Paper 16, Revision 2 (USACE, 2005). The MSD data were extracted from the approved ESS, Amendment 1 (Tetra Tech, 2004) and are presented in Table 4-1 below.

4.2.1.1 Project personnel are defined as those on-site Contractor and DoD personnel required to participate in the MEC removal/sampling, along with those approved and authorized visitors. All other personnel are non-project personnel. The outer boundaries of the MSD arcs are depicted on the map in Appendix B. The team separation distance at each designated site is listed in Table 4-2. Figure 4-2 depicts the intentional and unintentional detonation Minimum Separation Distances for each section. These distances are based on the K40 distance that was calculated using the formula $D = 40W^{1/3}$, where W is the explosive weight in pounds.

4.2.1.2 Positive control of the exclusion zone (EZ) based on the MSD will be maintained at all times that MEC operations are being conducted. Prior to beginning MEC operations, the Tt will ensure that there are no non-essential personnel within the EZ and that the EZ remains clear of non-essential personnel throughout the MEC operations. Access to the exclusion zone will be restricted to essential personnel and authorized visitors escorted by UXO personnel

Authorized Visitors are those individuals that will be conducting project or mission related functions, e.g., Quality Assurance Representatives (QAR's), safety and quality inspectors (including geophysicists performing quality assurance functions), and project management. Authorized visitors must be escorted while in the EZ and be approved for entry into the EZ in accordance with EP 385-1-95A. No more than 2 authorized visitors will be permitted in the EZ at any given time.

Table 4-1 Minimum Separation Distance for Each Section at the Fort McClellan Area

Removal Area	MGFD	MSD (ft) Intentional Detonation	MSD (ft) Unintentional Detonation
81mm Range	81mm HE M43	1,395	230
Range 20	81mm HE M43	1,395	230
Range 24A	155mm HE M107	2,577	447
Bains Gap Road	81mm HE M43	1,395	230
*Fort McClellan Final ESS, Choccolocco Area, US Fish and Wildlife Land Transfer, Amendment 1, January 2004.			

Table 4-2 Team Separation Distance for Each Section at the Fort McClellan Area

Removal Area	MGFD	Explosive Weight (W)	Team Separation Distance (ft)
81mm Range	81mm HE M43	1.29	44
Range 20	81mm HE M43	1.29	44
Range 24A	155mm HE M107	15.45	100
Bains Gap Road	81mm HE M43	1.29	44

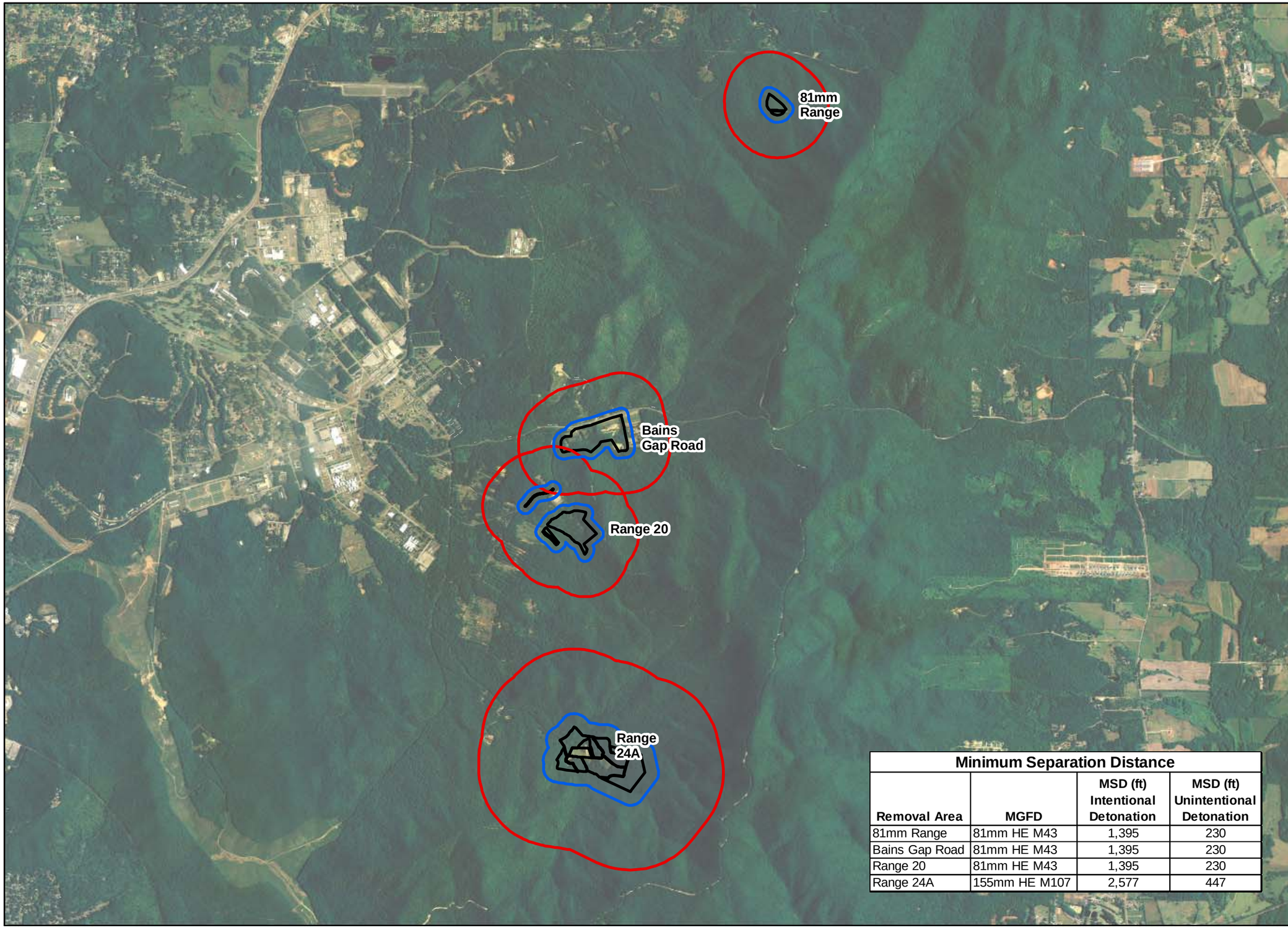


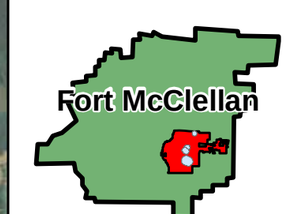
Figure 4-2
Intentional and Unintentional Detonation Minimum Separation Distances for Each Range

Legend

- Range Area
- MSD Unintentional Detonation
- MSD Intentional Detonation

N
W
E
S

0 0.5 1
Miles



Calhoun County

Minimum Separation Distance

Removal Area	MGFD	MSD (ft) Intentional Detonation	MSD (ft) Unintentional Detonation
81mm Range	81mm HE M43	1,395	230
Bains Gap Road	81mm HE M43	1,395	230
Range 20	81mm HE M43	1,395	230
Range 24A	155mm HE M107	2,577	447

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4.2.2 Engineering Controls

The withdrawal distance shown in Table 4-1 can be decreased, if necessary, by using accepted engineering controls. If the need arises, appropriate engineering controls will be developed with the client using appropriate guidance. TtEC may also request to use the Hazardous Fragment Distance (HFD) as described in the ESS to reduce an EZ if necessary.

4.2.3 Planned Demolition Areas

There are no planned demolition areas for this project. All recovered MEC/UXO will be either be consolidated within the grids if deemed acceptable to move or blown in place if not acceptable to move. If a MEC/UXO item cannot be blown in place due to the area not able to withstand a high order detonation and engineering controls would not effectively reduce the hazard, the Demolition Supervisor will notify the SUXOS and OE Safety Specialist immediately.

4.3 FOOT PRINT AREAS

4.3.1 Blow in Place

Blow in place operations require careful planning with the OE Safety Specialist to reduce blast, fragments and ground shock. The exact locations of all utilities present, if any, must be known prior to detonation.

4.3.2 Collection Points

Items determined safe to transport and designated for control detonation will be collected and delivered to the designated collection point for daily demolition. Collection points will be determined by the SUXOS and communicated to field teams at the beginning of each day.

4.3.3 In Grid Consolidation Shots

For grids determined to be safe demolition areas, items within that grid that can be safely moved will be consolidated and disposed of in the grid. If a grid is determined not to be a safe demolition area, and the items are determined acceptable to move, the item will be moved to another grid deemed a safe demolition area for a detonation. U.S. Army Engineering and Support Center, Huntsville (USAESCH) publication Procedures for Demolition of Multiple Rounds (Consolidated Shots) on OE Sites (March 2002) will be followed and a copy of this report will be available on-site.

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5.0 GEOPHYSICAL PROVEOUT PLAN

5.1 OBJECTIVE

The objective of the GPO is to demonstrate and document the performance of the proposed data acquisition methodology, equipment, and techniques. The following components of the geophysical system will be evaluated during the GPO field program to ensure the program objectives will be met:

- Spatial sample density (i.e., line and station spacing);
- Static and dynamic repeatability;
- Navigation and positioning methodologies;
- Sensor and positioning system platform (stability, noise characteristics and ergonomics);
- Data processing, analysis and interpretation; and
- QC and performance requirements for the proposed digital and analog mapping system;

The equipment which will be tested during the GPO includes the DGM system composed of a Geonics EM-61 MKII TDEM detector and the Leica Robotic Total Station and the Metris Constellation positioning systems along with the handheld Vallon, Minelab, or Whites metal detectors. All personnel who will operate geophysical equipment or handheld detectors will be certified through the GPO.

5.2 TEST PLOT DESIGN

TtEC will use the established test grid that was created by the United States Army Corps of Engineers (USAESCH).

5.2.1 Prove-out Size and Location

The grid size is 100’ x 100’, and is situated in a wooded area with sloping terrain. The GPO location was selected by the United States Army Corps of Engineers (USAESCH), and is located off of Bains Gap Road.

5.2.2 GPO Seed Items

One of the most important tasks for the GPO effort is to determine the ability of the DGM methods to meet the performance requirements for the project. Important performance requirements are related to the overall quality of the geophysical and positioning system measurements and include static and dynamic repeatability, sample density, sensitivity and precision, and overall equipment functionality in the site specific terrain, vegetation, and geology. This will require TtEC to temporarily place (duration of project) dynamic seed items (DGM) in the USAESCH GPO test plot and the survey grids, and coverage seed items and detection and recovery seed items (analog methods) in the TtEC test plot and the survey grids. A dynamic seed item is a standard item that is placed in each grid to show that the geophysical instrument provides a standard response (repeatability) to help demonstrate the DGM data quality is consistent and sufficient for detection of MEC items of interest. Dynamic seed items do not need to be blind. Coverage seed items are blind seed items and are placed in each analog method grid to demonstrate the analog operator's ability to cover the survey area adequately. Detection and recovery seed items are blind seed items and are placed in each analog method grid to demonstrate the analog operator's ability to detect MEC items of interest at the required depths. The number and types of seed items to be placed in the survey grids is presented in Section 6.7.2. The planned dynamic seed items are six to nine inch nails with washers to keep them flush with the ground surface. The dynamic seed items in the GPO will be used to derive baseline numbers for the dynamic seed items placed in the survey grids. TtEC will perform an offset/step test to determine the maximum detection distance for the smallest seed item of interest in each area (37mm and 81mm) to help determine maximum line spacing. Based on the expected MEC items and their maximum depths for the site (Section 6.1.4), it is anticipated that the detection and recovery seed items for analog methods will include a 37mm surrogate (~1.5in by 4in pipe nipple) and a 75mm surrogate (~3in by 7in pipe) buried at 1ft and 2ft respectively. Coverage seed items will be placed in the test plot that includes small metallic items that give a relatively large response over a small area such as a two inch pipe end cap. TtEC will survey the x-y-z location of the centroid of each seed item. TtEC geophysicists will use this information to determine a standard response for the dynamic seed items. TtEC will use the known USAESCH seed items in the USAESCH test plot, in addition to historical data from other GPO test sites to determine the anomaly selection criteria for each area. In addition to the known seed items and the seed items placed by TtEC, there are a number of seed items located in the GPO that are "unknown" to TtEC. In order to demonstrate the geophysical capabilities TtEC will conduct a survey of the GPO and provide the USAESCH with a map and the interpreted anomaly picks (known and unknown) in accordance with DID MR-005-05.01. After the map and picks have been turned in, the work will be evaluated by the USAESCH geophysicist.

5.3 SITE PREPARATION

There should be minimal site preparation needed, since TtEC will be using the existing GPO created by USAESCH. TtEC will emplace 10 dynamic seed items (nails) in the USAESCH test plot to establish a baseline response for the dynamic seed items placed in the project areas. TtEC will use the TtEC test plot for the analog GPO, and will require emplacing a total of 15 detection /recovery and coverage seed items within the test plot. TtEC will utilize 5 small and 5 large detection /recovery seed items and 5 coverage items to verify operator proficiency as outlined in section 5.12.

5.4 LOCATION SURVEYING

The location of the USAESCH test plot corners and known seed items will be provided by USAESCH. TtEC will survey the location of any added temporary seed items using the Robotic Total Station and the established grid corners for control.

5.5 BACKGROUND GEOPHYSICAL MAPPING

Background survey data will be provided by USAESCH.

5.6 EQUIPMENT

Based on our previous experience at numerous UXO sites, the EM61 MKII TDEM geophysical sensor exhibits the greatest potential to meet the project objectives. Based on the physical features present at the area of interest, the Leica Robotic Total Station (RTS) and Metris Constellation positioning systems will be used for the Charlie Areas. For analog methods, it is anticipated that EM based hand-held instruments will work best due to the potential magnetic geology in the Charlie area. Several EM based instruments will be tested in the test plot and include the Vallon, Minelab, and Whites metal detectors. The Schonstedt magnetic locater may also be tested. TtEC will evaluate the results of the GPO and if the EM61 MKII or hand-held instruments do not meet performance goals, TtEC will attempt to modify equipment and/or procedures until results are satisfactory to USAESCH.

5.6.1 EM61 MKII

A discussion of the EM61 MKII can be found in Section 6.2.2.

5.6.2 Navigation and Mapping Systems

Two positioning systems are necessary due to the physical characteristics of the survey area. The Metris Constellation is the most optimum positioning system for the heavily wooded areas in the area of concern, and the RTS will be used in the lightly wooded or open areas. GPS will not be utilized as the high tree line and canopy will eliminate important GPS satellites during certain times of the day, thus adversely affecting data quality and limiting production rates in certain areas. A more thorough discussion of the Metris Constellation and Leica RTS systems are provided in Section 6.2.4.

5.6.3 Sensor Configurations

The EM61 MKII geophysical sensor will be integrated with the RTS or Constellation positioning system. In the TtEC man-portable configuration, two operators will be used to collect the geophysical data. One person transports the EM61 MKII coils and RTS prism or Constellation wand (centered above the EM61 coils) while the other person, walking approximately ten feet behind, carries the EM61 MKII electronics, Juniper Allegro data recorder, and the RTS remote or Constellation electronics. The EM61 MKII lower coil height will be adjusted so that it remains at a height of 16 inches (+/- 1 inch) above the ground surface. The height of the lower coil will be measured prior to each data acquisition session to ensure repeatability between different team members and different data acquisition sessions.

5.7 DATA ACQUISITION PROCEDURES

Data acquisition procedures are discussed in Section 6.2.5.

5.8 DGM QUALITY CONTROL

TtEC-specific instrument and functional checks will be performed at the beginning of every data acquisition session for the GPO survey. The TtEC test regimen and anticipated performance metrics includes the following:

- Acquisition personnel metal check (ensure no metal on acquisition personnel);
- Vibration/cable shake test (< 2mV variation in channel 2 readings);
- Static geophysical sensor check (mean static spike minus mean static background +/- 10% of original);
- Static position check (position <= 12 in);
- Along Line Sample Rate (98% <= 10 in);
- Coverage (>95% of survey covered at maximum allowable line spacing);
- Kinematic geophysical sensor repeatability (test item response +/- 25%);
- Kinematic positioning repeatability (test item <= 12 in + ½ line spacing); and
- Repeat Line (repeat data within 20% of original values after drift corrections).

The test procedures outlined will be digitally documented and delivered via MS Access database to the client.

All field team members involved in data collection during the project will be involved with data collection during the GPO to document their ability to collect geophysical data as per the standards set forth in this work plan.

5.8.1 Equipment Warm-up

The geophysical sensor will be turned on and allowed to run for a minimum of five minutes prior to collecting data.

5.8.2 Personnel Test

Field team leaders will be accountable for and ensure that there is no metal (e.g., rings, chains, earrings, knives, wallets, belt buckles, et.) residing on personnel immediately prior to data acquisition activities.

5.8.3 Vibration Test (Cable Shake)

All cables will be shook in a manner simulating walking in rough terrain. Excessive noise induced from this test will be recorded and the appropriate corrective action(s) implemented (e.g., replace equipment cable, tighten connector, use tension relief device, etc.).

5.8.4 Static Background and Static Spike

The static test involves locating the instrument over a "geophysically quiet" area and recording data for a minimum of one minute, then placing a standard item at a fixed location on the instrument coil and recording an additional one minute of data.

5.8.5 Repeat Lines

At the end of each data acquisition session, the first line path will be repeated, or a diagonal path will be traversed across the grid that terminates at the start or end of the first line path.

5.9 DATA ANALYSIS AND INTERPRETATION

Geophysical measurements and position data will be stored on digital media during data acquisition. After acquisition over the GPO grid is complete, data will be transferred to the processing center for data processing and evaluation. A TtEC geophysicist will perform geophysical and position data processing and QC checks. Processing of the data will be performed with internally developed software that has been specifically produced to integrate and assess digital geophysical data acquired with the RTS and Constellation positioning system. These processed data are output to Geosoft Oasis Montaj Mapping software (version 7.01) for QC, analysis, and to create color-coded images of sensor intensity for interpretation. All recorded data channels of the EM61 MKII will be analyzed to ensure the most comprehensive data interpretation.

In general, the post processing that will be performed includes removal of instrument bias, removal of timing delays (i.e., lag, see section 6.2.5), and removal of geophysical sensor drift. Data will be recorded or transferred into Alabama East State Plane NAD83 (feet) coordinate system. All data processing parameters are stored in digital files (*.chk) or in the Oasis Montaj log file (*.log).

Data will be interpreted and a Microsoft Excel dig sheet generated in accordance with DID MR-005-05.01, Appendix B. This dig sheet, in addition to the MS Access database, will be provided to the client project team for evaluation and scoring. The dig sheet will also be provided to reacquisition personnel along with a color-coded image of sensor intensity for the target reacquisition phase of the GPO. Target selection criteria will be based on the anomaly responses of the known seed items in the GPO. The criteria will include amplitude and footprint (2D size and shape of anomaly). It is anticipated that for all areas other than the 81mm range the smallest MEC item of interest is a 37mm projectile.

5.10 REACQUISITION

The TtEC reacquisition team will perform reacquisition of the interpreted geophysical anomalies using the dig sheet. The RTS positioning system and the Vallon, Minelab, or Whites hand held TDEM systems will be used by reacquisition personnel to validate this system for the reacquisition phase of the project. The coordinates of the reacquired position will be compared to the interpreted coordinates on the dig sheet and presented in the GPO report.

5.11 DATA EVALUATION

Data will be evaluated by TtEC with respect to the number of known seed items detected, seed item response (milivolt reading, footprint), accuracy, and repeatability. The spatial sample density and "noise" level for the instrument configuration will also be evaluated to ensure the data are of sufficient quantity and quality to meet the project objectives.

5.12 ANALOG GEOPHYSICAL MAPPING (AGM)

Prior to start of field work, the UXOQC will supervise the establishment of a hand-held instrument test plot. The Instrument Test Strip will be documented on the Operators Test Plot Setup Report contained in Appendix F. To ensure operator proficiency and quality data is collected an operator instrument proficiency test will be conducted by the UXOQC on the operators utilizing the hand-held geophysical instruments that will be used for project operations. The instrument test strip will be created that will include several seed items for the analog teams to use to determine daily instrument/operator functionality. The detection and recovery seed items will include small and large items buried at their respective expected depths. The anticipated seed items include 37mm projectile surrogates at one ft and 75mm projectile surrogates at two feet. In addition, coverage seed items will be placed in the test strip that includes small metallic items that give a relatively large response over a small area such as a two inch pipe end cap. The instrument operator will conduct a sweep of the grid and mark the locations with pin flags of the items encountered during the sweep. The UXOQC will compare the results with the baseline record. To demonstrate proficiency to conduct project operations, an instrument operator must demonstrate the ability of detecting all seed items in the instrument test strip. Establishing the test grid and processing the instrument operators through the test grid is a QC function and will remain separate and independent from project operations.

5.12.1 AGM Quality Control

The TtEC test regimen and anticipated performance metrics includes the following:

- Acquisition personnel metal check (ensure no metal on acquisition personnel);
- Adequate lane coverage with instrument; and
- Detection of all seed items in test strip for analog instrument operators.

The operator will receive either a go/no go grade for this operator instrument proficiency test. The test procedures outlined will be documented on the Individual Operator Proficiency Test Sheet and a report with the results from all the instrument operators will be compiled on the Operator Proficiency Test Report also contained in Appendix F.

5.13 GPO LETTER REPORT

The results of the GPO will be submitted in the GPO letter report and will include, at a minimum, the following information:

- As-built drawing of the GPO plot if made available to TtEC;
- Pictures of the TtEC seed items;
- Color-coded maps of the geophysical data;
- Summary of the GPO results;
- Proposed geophysical equipment, techniques, and methodologies;
- Anomaly identification and selection criteria; and
- QC performance criteria.

A CD shall be delivered with the letter report containing the following files:

- The GPO Letter Report (Microsoft Word format);
- All raw and processed geophysical data. All data, except raw instrument data, shall be provided in column delineated ASCII files in the format x, y, c1, c2, etc., where x and y are Alabama East State Planar coordinates in Easting (ft) and Northing (ft) and c1, c2, etc., are the instrument readings. A time stamp for the measurements will also be included. Each data field will be separated by a comma or tab;
- Geophysical maps in their native format (Geosoft Oasis montaj™, or ESRI ArcView format) and as raster bit-map images such as BMP, JPG, or TIF;
- Known Seed item location spreadsheet (Microsoft Excel format); and
- MS Access Table (attachment B of DID MR-005-05.01) including contractor picks for each dataset.

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6.0 GEOPHYSICAL INVESTIGATION PLAN

A geophysical survey will be performed over an area of approximately 122 acres using Digital Geophysical Mapping (DGM) methods, or analog methods for areas that contain a slope of 40% or greater. The objective of the geophysical survey is to detect, accurately locate, and select anomalies that are representative of MEC and MPPEH. The selection of the optimum approach for this project will be based on the evaluation of the data collected at the GPO area.

6.1 SITE DESCRIPTION

Approximately 122 acres will be surveyed using either Digital Geophysical Mapping (DGM) methods or analog methods. An analysis of the topography indicates that approximately 100 acres is less than 40% slope and can be surveyed using DGM methods. The remaining 22 acres are greater than 40% slope and TtEC will use analog methods for detection if the terrain is too steep for DGM. Prior to mobilization, a GIS specialist will establish a 100 feet grid system over each survey area and determine which grids are suitable for DGM methods and which grids will require the use of analog methods.

6.1.1 Geophysical Data Quality Objectives

The GPO area will be used to evaluate the overall data acquisition methodology and sensor platform design in terms of spatial sample density, sensitivity, “noise” characteristics, and positional accuracy and repeatability to ensure that the acceptance criteria is achieved. QC performance goals will be determined during the GPO process and will include criteria for sample density, static repeatability, dynamic repeatability, sample density, positional accuracy, anomaly resolution, and target selection. The anticipated performance goals are listed in Section 5.8 and 6.7.1.

6.1.2 Area Map

See MEC Clearance Overview map located Appendix B.

6.1.3 Past, Current, and Future Use

Fort McClellan has documented use as a training area since 1912, when the Alabama National Guard used it for artillery training. As early as 1898 the Choccolocco Mountains may have been used for artillery training during the Spanish American War. The 29th Infantry Division used areas of the site for training prior to being ordered to France during World War I. Prior to World War II, the 27th Infantry Division assembled at Fort McClellan for training, and during the war many other units used the site for various training purposes. After World War II the site was used for National Guard training to include basic training and was also selected as the site for the Army's Chemical Corps and Military Police Schools.

The current use is wildlife refuge. The United States FWS, along with the Anniston-Calhoun County FMC Development JPA, established the Mountain Longleaf National Wildlife Refuge on a portion of Fort McClellan within the Charlie Area. The future use will also be wildlife refuge.

6.1.4 Anticipated UXO Types and Depths

The anticipated MEC types and depths for the Charlie Area are as follows:

Table 6-1
Expected MEC and Expected Depths

MEC Item	Expected Depths
Bains Gap Road Ranges	
Trip Flare	0 to 3”
37mm Projectile	0 to 12”
60mm Mortar	0 to 18”
2.36in Rocket	0 to 12”’
75mm Projectile	0 to 24”’
81mm Mortar	0 to 24”’
Range 20	
Trip Flare	0 to 3”
MKII Grenade	0 to 6”
Rifle Grenade	0 to 6”
37mm Projectile	0 to 12”
40mm Projectile	0 to 12”
75mm Projectile	0 to 24”
81mm Mortar	0 to 24”’
Range 24A	
Trip Flare	0 to 3”
MKII Grenade	0 to 6”
37mm Projectile	0 to 12”
75mm Projectile	0 to 24”
155mm Projectile	0 to 36”
81mm Range	
81mm Mortar	0 to 24”’

Items and depths based on Charlie EECA (2004),
Bains Gap RA (2006), and FWS Land Transfer Area Survey (2007)

6.1.5 Vegetation

The vegetation within the area of concern consists of open and wooded areas. The wooded area (i.e., canopy) prevents the efficient use of Global Positioning System (GPS) for positioning. Vegetation will be removed in accordance with Section 2.1.6.3.

6.1.6 Geologic Conditions

Fort McClellan is situated near the southern terminus of the Appalachian Mountain chain. All but the easternmost portion of the Main Post lie within the Valley and Ridge Province of the Appalachian Highlands. The portion of Fort McClellan west of Choccolocco Creek lies within the Piedmont Province. The age of the consolidated sedimentary and metamorphic rocks range from Precambrian to Pennsylvanian. On a large scale, most of the rocks have been intensely folded into an aggregate of northeast-southwest trending anticlines and synclines with associated thrust faults. Colluvial deposits characterize the shallow geology in the area.

The presence of metamorphic and igneous rocks in the area of concern increases the potential for minerals such as magnetite and other associated magnetic minerals. It is not anticipated that this condition will adversely affect the MKII data or EM-based hand-held sensors; however, the client will be notified if the TtEC geophysicists cannot meet the project objectives due to this condition.

6.1.7 Ground Water Conditions

Shallow groundwater beneath Fort McClellan occurs principally in the residuum developed from Cambrian sedimentary and carbonate bedrock units of the Weisner Formation in the Choccolocco Mountains and locally in the lower Ordovician carbonates (ESE, 1997).

Groundwater flow generally occurs in a northwesterly direction under a hydraulic gradient of 0.02 feet per foot, based on average groundwater elevation measurements from spatially clustered and widely spaced monitoring wells. Variability in the groundwater flow direction is likely to occur in localized areas of the Main Post, depending upon local topography, proximity to surface water bodies, and subsurface geology and structure. The measured groundwater elevations ranged between 677.1 feet above msl and 1,043.2 feet above msl on the Main Post (IT, 1999).

6.1.8 Site Utilities

Utilities, especially those of metallic origin, will be identified for the survey area using historical and current information. The location, approximate depth, and type of utility will be posted on the color-coded geophysical map of the area, if applicable, to ensure that intrusive activities occur in the safest manner possible.

6.1.9 Man Made Features

Man-made features such as power lines, roads, fences, vehicles, and any other features that may influence the geophysical investigation will be documented with specific information on the location, extent, and nature of the feature. This documentation may be in the form of a site features map (DID MR-005-05.01 Attachment A) or noted in logbooks and will be shown on geophysical maps. The information may also be stored in digital format by the RTS or Constellation. This process will allow the information to be transcribed onto a plan map of the survey area in the most cost-effective manner.

6.1.10 Site Specific Dynamic Events

Dynamic events that may affect geophysical investigations include weather (precipitation, wind, extreme temperatures) and electromagnetic "noise" from radio transmissions or solar storms. It is the responsibility of the field team leader to evaluate these events/conditions during acquisition to determine their effect, if any, on the geophysical data quality. If it is determined that these events/conditions are adversely affecting the data quality, data acquisition may cease until the event/condition ceases. If necessary, engineering controls may be implemented to reduce the effect of the disturbance (e.g., do not transmit on field radio within 25 feet of TDEM sensor).

6.1.11 Site Accessibilities

The project areas are inclusive of and adjacent to a maintained road. Access to work areas may be restricted by locked fences/gates. The TtEC field teams will lock the gates behind them upon entering restricted areas and will lock these gates again when leaving the work area.

6.1.12 Potential Work Hazards

Potential worker hazards specific to geophysical investigations include slips, trips, and falls (especially on steep/wet slopes or heavily vegetated areas), heat/cold stress, biological hazards (e.g., insects, snakes, poisonous biota), MEC hazards, vehicle operation, heavy lifting, severe weather (e.g., heavy rain), and cuts/punctures from sharp objects. Measures will be in-place and implemented prior to data acquisition to reduce/eliminate exposure to these hazards.

6.2 GEOPHYSICAL INVESTIGATION

6.2.1 Survey Type

Geophysical data will be collected over a two- dimensional (2D) grid on parallel transects that are approximately 2.0 feet apart, depending on the GPO results. While each area may be subdivided into smaller 100 feet x 100 feet grids for the intrusive investigation, the geophysical field teams will collect geophysical data over as large an area as possible (2 to 4 grids) during each data acquisition session to maximize productivity.

6.2.2 Equipment

6.2.2.1 Survey Platform

The man-portable (MP) method of data collection will be used during the geophysical survey. Specifically, the two-man tethered carry will be utilized, with one team member transporting the EM61 MKII coils, and the second team member transporting the EM61 MKII and RTS or Metris Constellation system electronics.

6.2.2.2 Detectors

The DGM sensor proposed is the Geonics Limited EM61 MKII system. The EM61 MKII uses time domain technology to facilitate the detection of metallic objects. The Geonics Limited EM61 MKII utilizes two coaxial receiver coils to measure the residual magnetic field generated by conductive and/or magnetic materials. The sensor electronics are designed to measure the residual magnetic field at a time when the response from conductive and/or magnetic objects is maximized, compared to the response from most earth materials. The use of two receiver coils also makes it possible to estimate depth. An additional benefit of the specific design of the EM61 MKII system is that it permits a more focused observation of the subsurface in areas of cultural interference, as well as in areas characterized by a high spatial density of subsurface metal objects. This is due to the mechanical design and operational parameters of the instrument, as well as the inherent nature of active electro-magnetic (EM) fields, which diminish in magnitude at a much higher rate than other sensor technologies such as magnetometry.

The EM61 MKII utilizes multiple time-gates centered at 216, 366, 660, and 1,266 microseconds (µs). The signal intensity for a given ferrous target recorded by the earlier time-gates is generally a factor of 2 to 4 times that recorded by the standard EM61 MK1 time-gate. This feature may facilitate a more reliable and repeatable interpretation of smaller targets such as igniters. A Juniper Allegro data recorder will be used to record the EM61 MKII measurements at a rate of 12-15 Hz,

The Juniper Allegro field computer is a waterproof, ruggedized field logger that operates in MS DOS v6.22 and MS Windows CE v3.01 environments. The unit contains 32 MB of Random Access Memory (RAM) for recording data, as well as a Personal Computer Memory Card International Association (PCMCIA) card slot where the amount of data that can be stored is limited only by the memory of the card. The Juniper Allegro is connected to the EM61 MKII backpack via a ruggedized 9 pin serial cable

The lower coil will be configured to be 16 inches (+/- 1 inch) above the ground surface. This distance will be measured and verified by field personnel prior to each data acquisition session.

Safety hazards for the EM61 MKII equipment include electromagnetic radiation. The electromagnetic field of the system could potentially detonate some types of specialized ordnance. The USAESCH recommends a ground clearance of at least 16 in when electrically fuzed ordnance is present.

6.2.3 Sampling Rates

The sampling rate for the EM61 MKII data will be 12-15 Hz. The RTS and Constellation sampling rate will be approximately 3 to 4 Hz. At a normal walking speed of approximately 3 feet per second, geophysical signal measurements are acquired at intervals of 3-4 inches along the ground surface.

6.2.4 Navigation and Mapping System

Two positioning systems are necessary due to the physical characteristics of the survey area. The Metris Constellation is the most optimum positioning system for the heavily wooded areas in the area of concern, and the RTS will be used in the open and less wooded areas, as the high tree line will eliminate important GPS satellites during certain times of the day, thus adversely affecting data quality and limiting production rates in certain areas.

The Metris Constellation consists of four or more laser transmitters and a field computer for logging the position data. Four to six Trimble Spectra Precision LS920 Laser Transmitters are positioned in a diamond or square, or rectangular geometry over ½ to 1 acre depending upon the tree density. The transmitters are leveled, and an automatic routine calculates the relative x-y-z- plane between the transmitters to a tolerance of 1 inch or less. A laser detector "wand" (i.e., receiver) is centered over the EM-61 MK2 coils on a TtEC-designed fiberglass "doghouse". The detector wand receives the laser pulses from the four transmitters simultaneously, and computes a position based on the known position of the laser transmitters. Only two of the laser transmitters are necessary to compute a reliable position to a relative accuracy of approximately 1 inch. The position data are updated at 3-4 Hz and sent via wireless modem to the field computer for storage.

The Leica Series 1100 or 1200 RTS consists of a laser-based total station survey instrument (transmitter), prism (receiver), and RCS 1100 remote control. The transmitter is positioned over a ground position point of known location, and an x-y-z Cartesian coordinate system is defined by occupying an additional known ground position with the prism. The RCS 1100 remote control handheld unit allows the operator to control the RTS instrument via wireless modem. The receiver prism is mounted on a TtEC doghouse centered over the EM61 MK2 coils, and the RTS automatically tracks the prism to an accuracy of approximately 1 inch. Position data for the receiver prism are updated at a rate of 3-4 Hz and stored on a PCMCIA card located on the RTS unit.

6.2.5 Procedures

It is anticipated that two three-man field teams will collect the geophysical data. One team will be used to survey areas using the Leica RTS, and the second team will survey using the Metris Constellation system.

Geophysical teams will begin data acquisition by performing all specified pre-mapping instrument checks. Once the equipment has been demonstrated to be operating properly, geophysical data collection will be accomplished by carrying the integrated detection and location system along overlapping transects within each survey grid. It is anticipated that a line spacing of approximately 2 feet will be utilized for this project. This technique will ensure 100% coverage of the survey area. Teams will use traffic cones, pin flags, or non-toxic spray paint to navigate within the survey grids. Obstacles affecting the survey (e.g., large rock outcroppings, streambeds, inaccessible areas, cultural features) will be noted in the team field notes to achieve a more complete understanding of the relationships between the site characteristics and the geophysical data (e.g., data gaps, anomalies due to surface item). At the beginning and end of each file, the coil operator will pass over a linear metal object (e.g. rebar) three times in opposite directions. During data processing, the processor will apply a lag correction such that the resulting anomaly from the

linear object is also linear. At the end of each day's activities, the field team leaders will provide the digital data to the geophysicist at the site-processing center for initial storage and initial analysis.

6.2.5.1 Wooded Areas

The Metris Constellation and EM61 MK2 equipment will be configured as a two man tethered carry as described in Section 6.2.2.1. Each setup will be no larger than 1.5 acres in size. Several fiberglass tape measures are positioned perpendicular to the direction of the data acquisition transects at intervals of approximately 50 feet. Specially modified traffic cones (or equivalent) are positioned along the intended transects at the measuring tape locations and the data acquisition crew uses these cones as "waypoints". When the crew reaches a waypoint, the sensor operator moves the cone sideways to the next intended transect (2.0 feet to the side) and continues navigating to the next waypoint (cone) along the current transect. As an alternative to this method, fiberglass pin flags may be placed along each transect and act as waypoints. A third method involves using spray paint to mark the currently acquired line. The coil operator then uses this mark on adjacent lines to keep a constant offset. The acquisition crew will proceed a minimum of 5 feet outside of the intended survey area, reverse direction, and proceed along the next adjacent transect. When encountering an obstacle, the sensor operator pauses for ~0.5 second, steps around the obstacle, and pauses for an additional 0.5 seconds. In this manner, the highest quality spatial data is obtained around obstacles.

6.2.5.2 Open Areas/Lightly Wooded Areas

The RTS laser-based system will be used in conjunction with the EM61 MK2 in the areas outside of the dense woods. Each setup will be no larger than 2.0 acres in size depending on terrain. Similar to procedures used in the wooded areas, tape measures and traffic cones or spray paint will be utilized to maintain proper line spacing. In unimpeded, smooth terrain the traffic cones may be spaced along each transect at distances no greater than 100 feet. This distance of 100 feet is used based on TtEC's extensive experience in assessing data acquisition paths for personnel that are right- or left-eye dominant. In rougher terrains a shorter distance is required if cones are used (~50 feet).

6.2.6 Personnel

The geophysical staff will consist of a Geophysical Task Manager (GTM), site geophysicist (SG), field team leaders (FTL), and two acquisition specialists. All of these individuals will be trained in the specific use of the instrumentation employed via the GPO. The GTM and SG will have experience and training in geophysical equipment operation, maintenance, and supporting software.

The GTM is responsible for overall coordination of data processing and analysis, technical content of deliverables, and technical review of data. The GTM will assist the TtEC project manager and USAESCH geophysicist to ensure the geophysical survey meets the project objectives. The specific responsibilities of the TtEC GTM include the following:

- Providing recommendations for project staff. Providing recommendations for additional staff, or a change in staffing requirements.

- Coordinating with the SG and FTL to ensure consistency of performance and maintenance of established schedules.
- Providing technical leadership in the discipline of geophysics and the quality control and assurance of the geophysical data.
- Monitoring technical performance of TtEC team members.
- Technically reviewing all deliverables of the study.

The SG is responsible for the administration of all field activities and geophysical personnel. The SG works as an integrated team with the GTM, TtEC project manager, and USAESCH geophysicists to ensure the success of the data acquisition phase of the project. The specific responsibilities of the SG include the following:

- Scheduling field crew activities in concert with the SUXOS.
- Establishing and maintaining daily, end-of-day communications with data acquisition team personnel and the SUXOS.
- Ensuring the proper equipment (e.g., sensors, cables, PCMCIA cards, manuals, etc.) computers, storage media, and supplies are present to perform each task.
- Maintaining data acquisition-related paperwork and digital acquisition files and ensuring their repeatability and accuracy (i.e., file and information systems management).
- Ensuring geophysical data is backed up a minimum of once per day and stored in a secure place.
- Supervising geophysical field operations.
- Logging all pertinent activities at the geophysical survey site in the field logbook and maintaining relevant project files.
- Data processing and interpretation.
- Monitoring, as necessary, QC instrument standardization/repeatability checks at a specified area for geophysical and positioning instrumentation.

The responsibilities and authority of the FTLs include the following:

- Ensuring that the field team collects data that is of sufficient quantity and quality to meet the project objectives.
- Documenting field activities in logbook and/or Field Data Sheet.
- Field transfer of data from the data recording devices to PCMCIA (or equivalent) media.

6.2.7 Production Rates

Based on our extensive site experience, it is anticipated that over a large percentage of the survey area, the EM61 MK2-RTS system can collect 1.0-2.0 acres per day in the "open" areas, and the EM61 MK2-Metris Constellation system between 1.0 and 1.5 acres per day in the wooded areas.

6.2.8 Data Spatial Density

Because of the variety and unique characteristics of the survey area and the necessity for complete coverage with the geophysical sensor, grid based data acquisition methodologies will be employed. The data acquisition "setups" may not necessarily be square or rectangular but will be established to allow complete coverage of irregularly shaped areas. In all cases, the "setups" will consist of uniformly spaced data acquisition lines suitable for traverse using the man-portable geophysical sensor systems.

The spatial sample density required to detect a target at a specific depth is one of the most important considerations in survey planning. Based on our past site-specific experience, it is anticipated that a survey line spacing of ~2.0 feet with a maximum spacing of 3.3 feet and an instrument recording interval of at least 10 times per second will be sufficient to detect small, shallow items of interest (e.g., 37mm projectile) with the EM61 MKII. The GPO results will be used to confirm the proper spatial density.

6.3 DATA PROCESSING

6.3.1 Field Data

The data acquisition file naming convention for the EM61 MKII, RTS, and Constellation will include the team identification, date, and file sequence identifier, at a minimum.

The positioning system and geophysical sensor files will be uploaded to the site processing computer and stored under a file folder system similar to the following:

Main File Name: Charlie/Geodata
- Folder Name 092705
- Folder Name interpretation
- Folder Name process
- Folder Name raw_em61
- Folder Name raw_RTS
- Folder Name raw_Metris Constellation

A data tracking mechanism (MS Access database, etc.) will be employed to document all data acquisition file names, as well as any changes that might occur. The data tracking form will track file name, grid, dates, personnel who performed the specific task (i.e., data acquisition team, processor, etc.) and have a section for comments. The data tracking form will be updated on a daily basis.

6.3.2 Standard Data Processing

The SG will process the data and perform field QC oversight during this phase of the geophysical program. The GTM will interpret the DGM data received from the SG. A second independent geophysicist will perform QC of the interpretation and resultant dig sheets. This procedure encourages independent analysis of the data and ensures the target selection criteria are consistent and the agreed upon performance standards are achieved.

The positioning and EM61 MKII signal data are merged with the TtEC software MergeMK2 developed by TtEC. The data from MergeMK2 are output as an ASCII file that contains the state planar coordinates (x,y,z), spatial sample density, elapsed distance, EM61 MKII signal intensity for each time gate, geophysical sensor and positioning sensor time stamp, and a position quality identifier.

Prior to interpretation, the processed *.xyz data are input into Geosoft Oasis Montaj v7 to generate color-coded images of all of the time gates of the EM61 MKII. Pre-defined Oasis Montaj scripts are used for all data analysis steps (e.g., import *.xyz file and generate database, drift correction, contour data) in order to eliminate computer keyboard errors during these processes.

6.3.3 Advanced Data Processing

No advanced data processing as specified in MR-005-05.01 is anticipated for this project. However, all processing operations and parameters are digitally logged in the TtEC *.chk processing files and/or the Oasis Montaj version 7.01 *.log files for each data acquisition session.

6.3.4 Anomaly Selection and Decision Criteria

Anomaly selection criteria will be based on the results of the site-specific GPO and consider the independent responses of the time gates, the “total intensity”, estimated depth for the anomaly, track path shape and spatial sample density, obstacles (e.g., trees), and anomaly footprint and signal to noise ratio. Geophysical field data and dig sheets will be delivered to USAESCH for QA review upon completion of each lot as per Section 3.3.3 of the PWS.

Oasis Montaj scripts will be used to generate color-coded images of the EM61 MKII data for each survey grid. Potential target locations will be selected by the data interpreter who manually selects potential target locations using data characteristics such as the signal amplitudes from the top and bottom coil channels, anomaly size and shape (footprint), anomaly trend, track line characteristics, terrain, reacquisition information, GPO results, and previous intrusive information. Specific selection criteria will be developed for each area and will be presented in the GPO report.

The data interpreter will classify the selected anomalies as “dig” or “no dig” based on the response of the seed items in the GPO. A 37mm is the smallest expected MEC item of interest and will be used for the minimum selection criteria for all areas except the 81mm Range, which will use an 81mm mortar for the selection criteria.

A master Oasis Montaj database for each area that contains all of the individual data acquisition files will be generated and updated each day in order to track the daily progress of the geophysical survey.

6.4 DIG SHEET DEVELOPMENT

The interpreted data are digitally recorded in a *.dat file, and uploaded to a Microsoft Access database. The dig sheet data for each survey grid will be organized by grid, and contain a unique anomaly identifier for each target selection, its x-y coordinate location, signal intensity value(s) from the EM61 MKII, and dig priority. Other pertinent information as specified in MR-005-05.01 will also be included in the project database.

6.5 ANOMALY REACQUISITION

The digital dig sheet data will be output as per the format required in the DID MR-005-05.01 as Access database tables. The project database manager will create files for upload to the respective positioning systems (CST or RTS). All personnel who are tasked with anomaly reacquisition will be "proven" based on the successful reacquisition of the anomalies in the GPO as per the requirements in DID MR-005-05.01.

The positioning systems will be checked for proper coordinate location by reacquiring and comparing (in the field) a minimum of one known grid corner prior to reacquiring any anomaly locations. PVC pin flag(s) will be positioned at the anomaly location(s) and labeled with the anomaly number for investigation by the intrusive team. The reacquisition team will record the position of the reacquired point to assist in the anomaly resolution step of QC.

6.6 DATA MANAGEMENT, FORMATS, AND SUBMITTALS

A data processing center will be established at the site for processing of the geophysical data. At this center data reduction and QC activities will be completed on a daily basis in order to verify that the project objectives are being met and to aid in the planning, or modification, if necessary, of the next day's field activities. Additional processing and interpretation of the data may be performed at the Lakewood Processing Center (LPC) in Lakewood, Colorado. All digital geophysical data will be backed-up each night on CDROM, DVD or the TtEC network.

6.6.1 Geophysical Mapping Data

All geophysical, mapping, reacquisition, intrusive, and QC data will be formatted and delivered per DID MR-005-05.01. All data will be delivered to USAESCH via internet using FTP.

- The raw geophysical and position data for each data acquisition session will be supplied to the client via the TtEC file transfer protocol (FTP) site (or equivalent method) no later than 24 hours after the data are collected for the first week and then weekly after that. These data will allow for corrections such as position, lag, and instrument bias, but there will be no advanced processing performed to these data. The format of the files will be ASCII and the initial data transfer will contain the header information and include a Readme.txt file that contains all significant metadata.

- Final processed data shall be produced and presented in ASCII formatted files and native geophysical processing software formats (e.g. Geosoft GDB). Final processed geophysical data will be drift corrected and will be the dataset used for the interpretation. File size will be limited to 100mB or 600,000 lines. Data will be delivered on a weekly basis at a minimum.

- All survey, dig sheet, reacquisition, intrusive and QC data will be stored in MS Access according to DID MR-005-05.01 Attachment B and will be delivered with each data submittal (minimum weekly).

- The geophysical data will be presented on maps in accordance with MR-005-05.01, paragraph e, and will include at a minimum the color contoured EM data, anomalies marked with symbols, grid lines, map scale, title block, and legend. In addition, a digital planimetric map in ESRI ArcView format (or Geosoft) will be provided to USAESCH at the beginning of the project.

6.7 GEOPHYSICAL QUALITY CONTROL

6.7.1 Performance Goals

The performance goals for this project are shown below. These goals are dependent on site specific conditions and may be modified based on the GPO results. If the results from the GPO demonstrate that these goals cannot be achieved, USAESCH will be notified and alternative goals will be developed.

The TtEC performance goals include the following:

DGM

- Acquisition personnel metal check (no metal on acquisition personnel);
- Vibration/cable shake test (< 2mV variation in channel 2 readings);
- Static geophysical sensor check (mean static spike minus mean static background +/- 10% of original);
- Static position check (position <= 12 in);
- Along Line Sample Rate (98% <= 10 in);
- Coverage (>95% of survey covered at maximum allowable line spacing);
- Kinematic geophysical sensor repeatability (test item response +/- 25%);
- Kinematic positioning repeatability (test item <= 12 in + ½ line spacing;
- Repeat Line (repeat data within 20% of original values after drift corrections); and
- 100% anomaly resolution of checked target locations.

AGM

- Detection of all seed items in test strip for analog instrument operators;

- Detection of all coverage seeds in analog mapping lots;
- Detection of all detection and recovery seeds in analog mapping lots; and
- 100% anomaly resolution of checked target locations.

6.7.2 Seeding Program

To assist in meeting the preceding performance goals, TtEC will implement a seeding program per Section 7.0 of the PWS for additional assurance that the DGM data and analog mapping processes are of sufficient quantity and quality to meet the project objectives. The seeding program will address the PWS performance requirements for dynamic positioning and dynamic detection for DGM methods, and coverage, and detection and recovery for analog instruments. The QC geophysicist and UXOQCS will review the completed dig sheets and geophysical data for the seed items emplaced in the grids to ensure that the performance standards for these requirements are continuously achieved during the duration of the project. It is anticipated that a minimum of one seed item per grid will be emplaced for DGM methods and six seed items per grid will be emplaced for the analog instrument grids (depending on field crew size). The grid corner nail may be used for the DGM dynamic seed item. Based on an anticipated analog team size of 6 operators, three coverage seed items and three detection and recovery seed items will be placed in each analog grid. There will be at least one of each detection and recovery seeds (37mm and 75mm) in each analog grid with the exception of the 81mm range survey grids which will have only the larger (75mm) seed items. The GIS determined grid system in conjunction with the slope analysis will be used to determine which grids will be seeded for DGM methods and which grids will be seeded for analog methods. The UXOQC staff will emplace and record the location of all seed items on the Seeding Checklist contained in Appendix F.

6.7.3 Anomaly Resolution

Anomaly resolution for grids mapped using DGM methods will be accomplished by checking selected anomalies with an EM61 after intrusive operations are complete for each lot and anomaly feedback. The rate for checking will be 10% of total digs in each lot. The UXOQCS will check open holes in areas where analog methods were used using the same basis for calculations.

Anomaly Feedback - The project QC geophysicist will review the intrusive data and compare the information with the geophysical data characteristics to ensure consistency between the results. Should intrusive results diverge significantly from interpretation data (e.g., “no find” percentage exceeds 15% as a running average for the project, inconsistency between the geophysical anomaly characteristics and the size and material properties of the item(s) excavated), a procedure will be implemented to evaluate the components of the relevant processes involved. This procedure will ensure that the disparity between the results is minimized for subsequent intrusive grids investigated. The geophysical investigation components that will be evaluated include those associated with data acquisition (coverage, density, quality, noise levels, positioning), data processing (merging of sensor data and position data, background shifts), and data interpretation (anomaly selection, computer calculations for location and estimated depths). The procedures for target reacquisition will also be evaluated. Corrective measures will be

implemented, as necessary, to ensure that subsequent interpretive data and/or reacquisition procedures are modified to more accurately reflect ground-truth results.

6.7.4 Lot Determination

Quality control data will be tracked and delivered to USAESCH on a lot based system. The lot sizes will be different for DGM areas and analog method areas due to the limited areas that are expected for analog methods. The initial lot size for DGM areas will be 8 grids (~ 2acres) and for analog grids will be 4 grids (~1 acre). The lot size may be modified after field activities begin to accommodate changes in anticipated field conditions such as high density areas, slope, vegetation, DGM vs. analog. Each lot will be mapped exclusively by one team so that any QC issues can be traced back to a specific team and root cause analysis and corrective actions can be implemented more efficiently.

6.7.5 Corrective Actions

Corrective actions are discussed in Section 10.9.2.

7.0 SURVEYING, GEOSPATIAL INFORMATION AND ELECRONIC SUBMITTALS

This Chapter presents the methods, equipment, and accuracy required for conducting location surveys and mapping, and managing geospatial information in support of UXO removal activities at Fort McClellan, AL. The plan was prepared IAW DID MR-005-07.01 and provides details of the methods and equipment to be used to achieve accuracy requirements in performing location surveying and mapping. TtEC will employ the services of a Professional Land Surveyor to stake the boundaries and grid corners of the Charlie survey area.

7.1 COORDINATES

All surveying, DGM, and removal actions will be performed using the Alabama State Plane East, North American Datum (NAD) 83 coordinate system in units of feet.

7.2 UXO SAFETY PROVISION

During all phases of location surveying and mapping activities, a UXO Technician II will accompany the surveyor or geophysical personnel performing survey work and perform anomaly avoidance for all survey activities. Through visual inspection, aided by a handheld magnetometer, the UXO Technician II will visually inspect the surface of the areas that will be traversed by the personnel performing survey tasks and areas where equipment will be set up. The UXO Technician II will conduct a magnetometer survey of any point where stakes are to be driven or monuments set. All potential access routes, such as trails or wooded paths that intersect suspected areas, will also be surveyed in this manner to ensure the safety of all site personnel. The UXO Technician II will be responsible for performing visual reconnaissance of the proposed survey area to remove metallic surface debris and any potentially dangerous MEC.

7.3 CONTROL POINTS/GRID POINTS

Coordinates for the boundaries and grids will be assigned from established survey control points. The requirement for new or additional control points will be based on the availability of existing control points. Should additional control points be necessary, they will be established in accordance with EM 1110-1-4009 and EM 1110-1-1002. Newly established permanent control points will consist of iron or steel pins, or concrete monuments, with 3 ¼ to 3 ½ - inch domed brass, bronze or aluminum alloy survey markers with witness posts. The top will be set flush with the ground surface and the bottom will be set a minimum of 0.6 meters below frost depth. The concrete monuments will be located within the project limits, set a minimum of 10 meters from the edge of any existing road within the project limits. Each concrete monument will be field marked using tape flagging or pin flags for convenient identification purposes.

The grid corners will consist of 18inch wooden stakes. The height of the stakes shall protrude no greater than 12 inches above the ground surface once installed. The wooden stakes will either be painted orange or marked with high visibility flagging material. Each stake will be marked with permanent ink (e.g. sharpie) with a unique ID. Each grid location shall have a six to nine inch nail with a washer to keep them flush with the ground surface placed adjacent to the grid stake.

7.3.1 Accuracy

The accuracy of the horizontal and vertical control will be accomplished by maintaining "Class 1, Third Order" or better for the network of monuments. Horizontal control will be based on the Alabama State Plane East North American Datum of 1983 (NAD83). The vertical control will be referenced to the North American Datum of 1988 (NAVD88). Horizontal accuracy requirement for Control Points is less then 2 inches. Horizontal accuracy requirement for Grid and Boundary points is less then 12 inches.

7.3.2 Monument Caps

The network of monuments will be identified with brass, bronze or aluminum alloy caps. Each new monument will be stamped in a consecutively numbered sequence indicating the Charlie Area name and the USAESCH as the Government entity. The dyes to be used for stamping the individual numbers and letters into these monument caps will be between 1/8-inch to 3/16- inch in size. All coordinates and elevations will be shown to the closest one-hundredth of a foot (0.01 ft).

7.3.3 Map Requirements

The control points recovered and/or established in the Charlie Area will be plotted at the appropriate coordinate point on a reproducible electronic, or hard copy media planimetric or topographic map. Points to be plotted include all monuments, buildings, roads, railroads, and property corners. Maps for each area will be plotted at a scale of 1 inch = 50 feet (1:600). The site map will be plotted at a scale of 1 inch = 200 feet (1:2400). Each control point will be identified on the map by its name and number and the final adjusted coordinates and elevations in feet to the closest 0.01 ft. Each map will include a grid north, a true north and a magnetic north arrow with differences between them in minutes and seconds shown. Grid lines or tic marks at systematic intervals with their grid values will be shown on the edges of the map. A legend will provide the standard symbols used for the mapping along with a map index showing each site in relationship to all other sites within the boundary lines of the project area.

7.3.4 Monument Description

The descriptions of any used or established control points will be captured in the project GIS database and will include:

- The monument name/number;
- Coordinates and elevation;
- Text describing the location of the monument from a easily identifiable point.

7.4 DIGITAL FORMAT FOR GIS DATA

7.4.1 Sources and Standard

TtEC will take the GIS data and database structure provided by USAESCH and incorporates any geospatial data generated during the project. This geospatial data will include all information from the MS Access project database (DID MR005-05.01 Attachment B). All digital GIS data will be created using ArcView. All data will conform to the Spatial Data Transfer Standard (SDTS) and be ESRI-compliant (GeoDatabases). The standards are designed for computer assisted mapping methods that must interface with other surveying firms, government contractors and customers. Raster data (geophysical color-contoured data, orthophotography, remote sensing imagery, etc.) will be provided in Tagged Image File format (TIF). Supporting tabular data will be provided in ANSI SQL language format as well as or Microsoft Access. The GIS data will be provided in ArcGIS format including mxd and shp files and will include all appropriate Meta Data. The final electronic submittal will also include layout files for all plates, figures, and drawings conveyed in the Final Report.

7.5 FILE BACKUP

Each day after the data has been uploaded to the project database, the GIS data and the project database will be copied to removable media (write-able compact disc [CD-R], tape or ZIP disk) and placed in a secure storage area. The data processing progress will be documented on the data tracking spreadsheet.

7.6 QUALITY CONTROL

QC checks, including appropriate database queries, will be completed periodically to confirm accurate data loading and ensure all anomalies investigated have data incorporated into the database (completeness). This process will be accomplished by reviewing the dig packages and tracking logs against the database entries to ensure records have been entered for all assigned targets prosecuted to date. This activity will be the responsibility of the Database Manager.

The Quality Control Manager will verify the performance of these QC activities. The QCM will also review the UXO intrusive data entered in the database. This inspection will include reviewing a portion of the hard-copy data forms and confirming that the data was entered into the database accurately and uniformly.

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8.0 WORK, DATA, AND COST MANAGEMENT PLAN

The purpose of this Work, Data, and Cost Management Plan (WDCMP) is to ensure the effective management of allocated funds, manpower, and equipment on the Charlie Area project. This plan describes the resources and tools TtEC will use to manage the project to ensure effective delivery of the required scope of services.

8.1 SCHEDULE

Figure 8-1 is a schedule of the anticipated tasks and milestones. The schedule will be used to track the work progress and to identify individual tasks that have the potential to impact the project schedule. A current schedule will be included in the Weekly Status Report IAW DID MR-085. Schedule impacts will be immediately discussed with the USAESCH PM along with proposed resolutions.

8.2 MANPOWER REQUIREMENTS

The SUXOS, UXOSO, UXOQC, UXO Technicians, Geophysicists, laborers, and equipment operators will be on-site during the performance of all field work. The on-site TtEC team will be supported by additional technical and support personnel on an as-needed basis during performance of the work. Additional on-site UXO personnel must be approved by the USAESCH Contracting Officer based on recommendations of the PM prior to mobilization.

8.3 COST CONTROL AND TRACKING

8.3.1 Cost Control

The Project Manager will approve all hours charged to the project by all field and office personnel to ensure no unauthorized hours are charged to the Charlie Area. TtEC's accounting system will provide weekly updates of all charges posted to the project. The PM will use these data to compare cost and schedule performance to the baseline cost-schedule data at least once weekly. Any significant variation will immediately be brought to the attention of the USAESCH PM, if appropriate. TtEC will report cost and schedule performance on a monthly basis in accordance with the 26 June 2008 PWS.

8.4 RECURRING DELIVERABLES

This Chapter describes recurring deliverables that will be prepared during performance of work under the Charlie contract. Recurring deliverables include weekly status reports.

8.4.1 Weekly Progress Report

The PM or his designee will prepare and submit the weekly report prepared IAW DID MR-085 and the 26 June 2008 PWS. This report will be submitted to the USAESCH PM not later than the close of business on the first day of the following work week. Weekly reports will only be prepared during periods of fieldwork.

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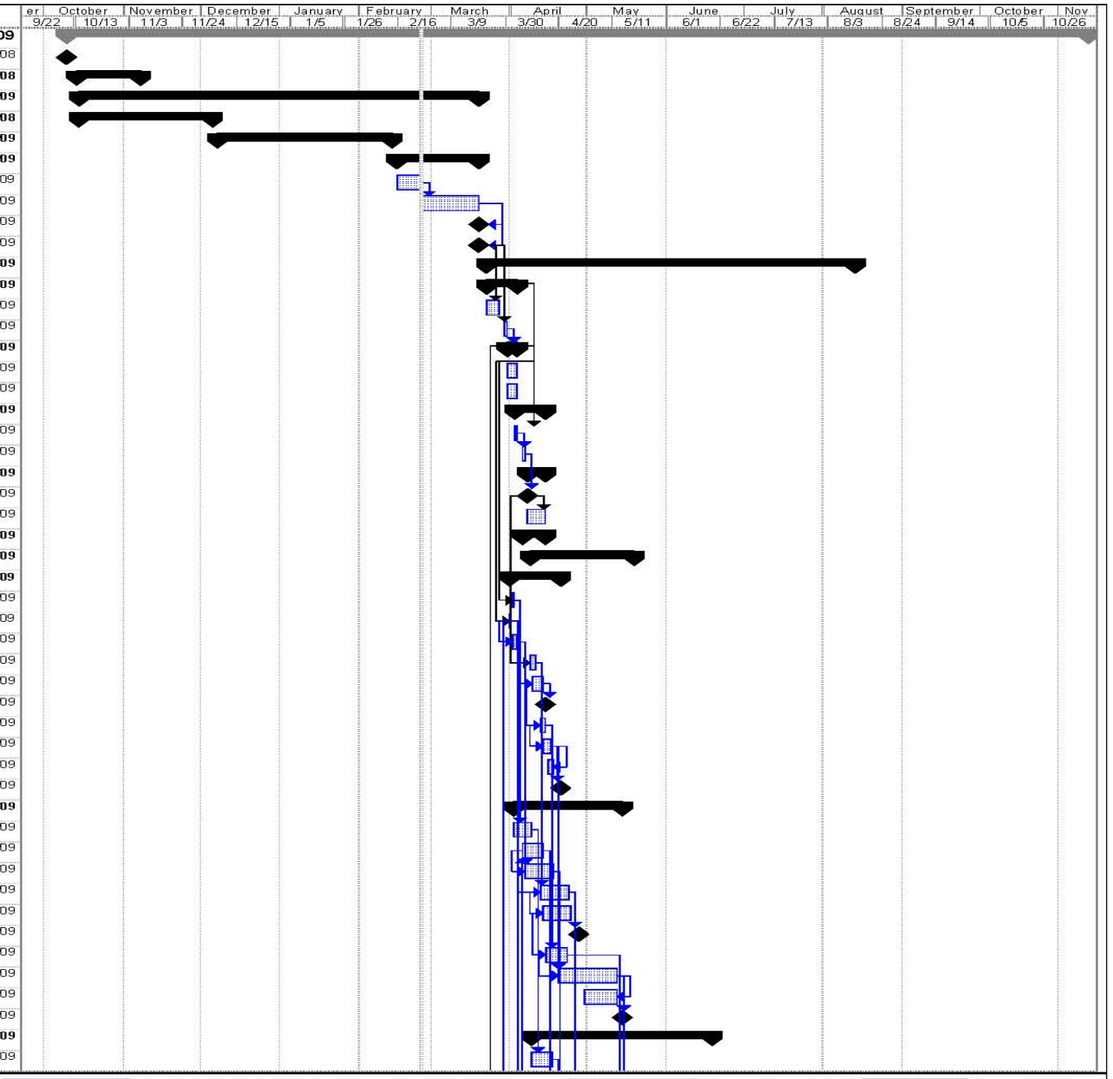
Table 8-1 Baseline Project Schedule

ID	Category	Task Name	Duration	Start	Finish
0		**Fort McClellan - Charlie Area Remedial Action**	**282 days**	**Fri 10/10/08**	**Thu 11/12/09**
1		Award	0 days	Fri 10/10/08	Fri 10/10/08
2	1	**Project Preparation and Planning**	**19 days**	**Mon 10/13/08**	**Fri 11/7/08**
12	2	**Work Plan (WP)/GPO Plan**	**109 days**	**Wed 10/15/08**	**Fri 3/20/09**
13		**Draft WP/GPO Plan**	**37 days**	**Wed 10/15/08**	**Fri 12/5/08**
16		**Draft Final WP/GPO Plan**	**48 days**	**Mon 12/8/08**	**Fri 2/13/09**
21		**Final WP/GPO Plan**	**24 days**	**Mon 2/16/09**	**Fri 3/20/09**
22	P	Prepare and Submit	8 days	Mon 2/16/09	Wed 2/25/09
23	R	Government Review & Comment	16 days	Thu 2/26/09	Thu 3/19/09
24	$	Final WP Acceptance	0 days	Fri 3/20/09	Fri 3/20/09
25		Notice to Proceed (NTP)	0 days	Fri 3/20/09	Fri 3/20/09
26	3,4	**Removal Actions - Surface, Geophysical Field Work, and Subsurfa**	**104 days**	**Mon 3/23/09**	**Thu 8/13/09**
27		**Mobilization**	**10 days**	**Mon 3/23/09**	**Fri 4/3/09**
28	M	Site Setup	5 days	Mon 3/23/09	Fri 3/27/09
29	M	Mobilize Field Staff	1 day	Mon 3/30/09	Mon 3/30/09
30		**Site Specific Training**	**4 days**	**Tue 3/31/09**	**Fri 4/3/09**
31	QC	Preperatory Phase Inspections/ Site Specific Training	4 days	Tue 3/31/09	Fri 4/3/09
32	QC	Conduct Instrument Operators Proficiency Test	4 days	Tue 3/31/09	Fri 4/3/09
33		**Geophysical Proveout (GPO)**	**6 days**	**Fri 4/3/09**	**Tue 4/14/09**
34	GPO	Inspect and Prepare Geophysical Equipment	1 day	Fri 4/3/09	Fri 4/3/09
35	GPO	Perform a GPO for DGM	1 day	Mon 4/6/09	Mon 4/6/09
36		**GPO Letter Report**	**5 days**	**Tue 4/7/09**	**Tue 4/14/09**
37	$	Prepare and Submit GPO Letter Report	0 days	Tue 4/7/09	Tue 4/7/09
38		Government Review & Comment	5 days	Wed 4/8/09	Tue 4/14/09
39		**Blind Seeding**	**7 days**	**Mon 4/6/09**	**Tue 4/14/09**
42		**Tire House Disposal**	**28.5 days**	**Thu 4/9/09**	**Tue 5/19/09**
47		**81mm Mortar Range (5.7 acres)**	**14 days**	**Wed 4/1/09**	**Mon 4/20/09**
48	SV	Survey	0.5 days	Thu 4/2/09	Thu 4/2/09
49	SC	Surface Clearance	0.5 days	Wed 4/1/09	Wed 4/1/09
50	BC	Brush Clearance	2 days	Thu 4/2/09	Fri 4/3/09
51	GM	Geophysical Mapping	2 days	Thu 4/9/09	Fri 4/10/09
52	GIP	Geophysical Data Interpretation/Processing	2 days	Fri 4/10/09	Mon 4/13/09
53	$	Submit (81mm Range) Mapping Data	0 days	Tue 4/14/09	Tue 4/14/09
54	GR	Geophysical Reacquire	2 days	Mon 4/13/09	Tue 4/14/09
55	SSC	Subsurface Clearance	3 days	Tue 4/14/09	Thu 4/16/09
56	QC	Anomaly Resolution	2 days	Thu 4/16/09	Fri 4/17/09
57	S	Submit 81mm Range Clearance Report	0 days	Mon 4/20/09	Mon 4/20/09
58		**Range 20 (25.5 Acres)**	**30.5 days**	**Thu 4/2/09**	**Thu 5/14/09**
59	SV	Survey	5 days	Thu 4/2/09	Thu 4/9/09
60	SC	Surface Clearance	5 days	Mon 4/6/09	Mon 4/13/09
61	BC	Brush Clearance	9 days	Tue 4/7/09	Fri 4/17/09
62	GM	Geophysical Mapping	9 days	Mon 4/13/09	Thu 4/23/09
63	GIP	Geophysical Data Interpretation/Processing	9 days	Tue 4/14/09	Fri 4/24/09
64	$	Submit Range 20 Mapping Data	0 days	Mon 4/27/09	Mon 4/27/09
65	GR	Geophysical Reacquire	6.5 days	Wed 4/15/09	Thu 4/23/09
66	SSC	Subsurface Clearance	14 days	Mon 4/20/09	Tue 5/12/09
67	QC	Anomaly Resolution	9 days	Thu 4/30/09	Tue 5/12/09
68	$	Submit Range 20 Clearance Report	0 days	Thu 5/14/09	Thu 5/14/09
69		**Bains Gap Road Ranges (36.7 Acres)**	**50.5 days**	**Thu 4/9/09**	**Thu 6/18/09**
70	SV	Survey	6 days	Thu 4/9/09	Fri 4/17/09



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Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress | Split | External Tasks | Project Summary | Group By Summary | Deadline

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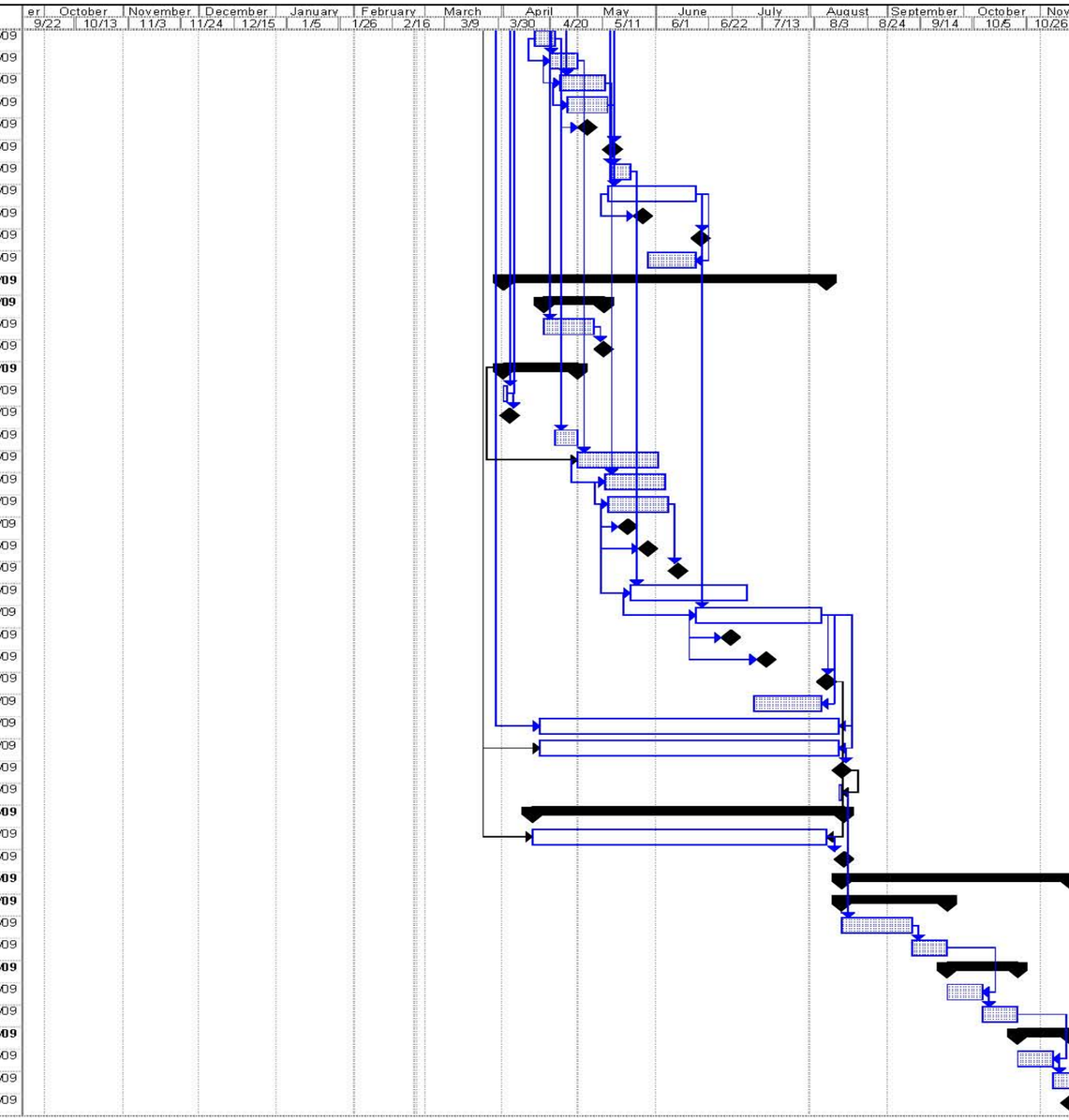
ID	Category	Task Name	Duration	Start	Finish
71	SC	Surface Clearance	5 days	Tue 4/14/09	Tue 4/21/09
72	BC	Brush Clearance	9 days	Mon 4/20/09	Thu 4/30/09
73	GM	Geophysical Mapping	12 days	Fri 4/24/09	Mon 5/11/09
74	GIP	Geophysical Data Interpretation/Processing	12 days	Mon 4/27/09	Tue 5/12/09
75	$	Submit BG Mapping Data -1	0 days	Mon 5/4/09	Mon 5/4/09
76	$	Submit BG Mapping Data -2	0 days	Thu 5/14/09	Thu 5/14/09
77	GR	Geophysical Reacquire	6 days	Thu 5/14/09	Thu 5/21/09
78	SSC	Subsurface Clearance	20 days	Wed 5/13/09	Tue 6/16/09
79	$	Submit BG Clearance Report - 1	0 days	Tue 5/26/09	Tue 5/26/09
80	$	Submit BG Clearance Report - 2	0 days	Thu 6/18/09	Thu 6/18/09
81	QC	Anomaly Resolution	13 days	Fri 5/29/09	Tue 6/16/09
82		**Range 24A (66.3 Acres)**	**92.5 days**	**Wed 4/1/09**	**Fri 8/7/09**
83		**Survey**	**16 days**	**Fri 4/17/09**	**Mon 5/11/09**
84	SV	Survey	14 days	Fri 4/17/09	Thu 5/7/09
85	$	Survey Report	0 days	Mon 5/11/09	Mon 5/11/09
86		**Surface Clearance**	**17.5 days**	**Wed 4/1/09**	**Thu 4/30/09**
87	SC	Surface Clearance Only (12 Acres)	1.5 days	Wed 4/1/09	Thu 4/2/09
88	$	Submit Range 24A Surface Clearance Report	0 days	Fri 4/3/09	Fri 4/3/09
89	SC	Surface Clearance Remaining Area (54.3 Acres)	7 days	Wed 4/22/09	Thu 4/30/09
90	BC	Brush Clearance	22 days	Fri 5/1/09	Mon 6/1/09
91	GM	Geophysical Mapping	18 days	Tue 5/12/09	Thu 6/4/09
92	GIP	Geophysical Data Interpretation/Processing	18 days	Wed 5/13/09	Fri 6/5/09
93	$	Submit Range 24A Mapping Data - 1	0 days	Wed 5/20/09	Wed 5/20/09
94	$	Submit Range 24A Mapping Data - 2	0 days	Thu 5/28/09	Thu 5/28/09
95	$	Submit Range 24A Mapping Data - 3	0 days	Tue 6/9/09	Tue 6/9/09
96	GR	Geophysical Reacquire	32.5 days	Fri 5/22/09	Tue 7/7/09
97	SSC	Subsurface Clearance	29 days	Wed 6/17/09	Wed 8/5/09
98	$	Submit Range 24A Clearance Report	0 days	Tue 6/30/09	Tue 6/30/09
99	$	Submit Range 24A Clearance Report	0 days	Tue 7/14/09	Tue 7/14/09
100	$	Submit Range 24A Clearance Report	0 days	Fri 8/7/09	Fri 8/7/09
101	QC	Anomaly Resolution	19 days	Fri 7/10/09	Wed 8/5/09
102	SP	Disposal/Disposition of Material Potentially Presenting an Explosiv	85 days	Thu 4/16/09	Wed 8/12/09
103	QC	Quality Control (QC)	85 days	Thu 4/16/09	Wed 8/12/09
104		Contracting Officer Verifies Investigation Completion	0 days	Thu 8/13/09	Thu 8/13/09
105		Demobilization of Site	1 day	Thu 8/13/09	Thu 8/13/09
106	5	**Geospatial Data**	**90 days**	**Mon 4/13/09**	**Fri 8/14/09**
107	GIS	Geospatial Data Management	85 days	Mon 4/13/09	Fri 8/7/09
108	$	Final GIS Data Submission	0 days	Fri 8/14/09	Fri 8/14/09
109	6	**Site Specific Final Report (SSFR)**	**65 days**	**Fri 8/14/09**	**Thu 11/12/09**
110		**Draft SSFR**	**30 days**	**Fri 8/14/09**	**Thu 9/24/09**
111	P	Prepare and Submit	20 days	Fri 8/14/09	Thu 9/10/09
112	R	Government Review & Comment	10 days	Fri 9/11/09	Thu 9/24/09
113		**Draft-Final SSFR**	**20 days**	**Fri 9/25/09**	**Thu 10/22/09**
114	P	Prepare and Submit	10 days	Fri 9/25/09	Thu 10/8/09
115	R	Government Review & Comment	10 days	Fri 10/9/09	Thu 10/22/09
116		**Final SSFR**	**15 days**	**Fri 10/23/09**	**Thu 11/12/09**
117	P	Prepare and Submit	10 days	Fri 10/23/09	Thu 11/5/09
118	R	Government Review & Comment	5 days	Fri 11/6/09	Thu 11/12/09
119	$	Final SSFR Acceptance	0 days	Thu 11/12/09	Thu 11/12/09



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8.5 PROJECT MANAGEMENT APPROACH

8.5.1 Project Management

Figure 2-1 depicts the task organization that TtEC will utilize throughout the execution of the various tasks associated with this project. This team provides the appropriate level of management, safety, and quality oversight to ensure that all work will be performed in an efficient, safe, and cost-effective manner.

8.5.1.1 Work Plan

The Work Plan will be reviewed periodically to ensure that the approaches and procedures utilized continue to provide the best product and outcomes possible. Any proposed changes to the Work Plan will be submitted to the USAESCH PM who will request concurrence from the Project Delivery Team and Design Integrator prior to submission to the Contracting Officer.

8.5.1.2 Environmental Health & Safety

The USAESCH PM, the SUXOS, the UXOQC and other key safety staff will regularly review the EHS aspects of the project. Information on EHS issues will be communicated daily to all personnel during the morning safety brief.

8.5.1.3 Risk Awareness and Management

TtEC maintains a rigorous approach to Risk Awareness and Management both through extensive higher management and executive reviews and also through the TtEC Task Initiation Procedure (TIP) and subsequent Risk Management Plan (RMP). The TIP and RMP are internal TtEC documents reviewed by several specialists within the corporation and are required to be reviewed and updated as conditions change or new situations arise.

8.5.1.4 Status and Monitoring

Status and monitoring of field operations will be carried out. The basis of this plan will be a Microsoft Access database designed to track and manage field data. The database will document the status of each investigated grid from brush clearing to final QC check. Team separation distances and exclusion zones will also be managed with this information.

8.5.1.5 Project Controls

Project Controls encompasses the schedule and financial facets of the project. The assigned Project Controls Engineer will assist the PM in monitoring financial and schedule information for inclusion into project management decisions and periodic reports (weekly) to the USAESCH.

8.5.1.6 Procurement

The PM is responsible for initiating procurement of all personnel, equipment and services and will monitor the conduct of subcontracts and payment details IAW TtEC standard procedures and contract requirements. Procurement actions will be performed by TtEC procurement specialists at the direction of the PM.

8.5.1.7 Quality

In conjunction with the UXOQC, periodic reviews will be carried out on the QC aspects of the Charlie Area. Additional detail is provided at Chapter 10.0, Quality Control Plan.

8.5.1.8 Staffing and Resource Management

The PM and the SUXOS will periodically review staffing and resource issues on the project and plan the efficient mobilization and demobilization of staff and resources and replacement/rotation where applicable.

8.5.1.9 Cash Management

The PM, supported by the TtEC Project Controls Engineer, will prepare and issue invoices monthly to the USAESCH Contracting Officer for services performed under the project.

8.5.1.10 Communications

The PM will review periodically the effectiveness of communications systems as well as internal and external (with USAESCH and Fort McClellan) written and verbal communication protocols.

8.5.1.11 Document Control

The PM will have the primary responsibility for the preparation, review, amendment and issuance of all documents including the work plans, community relations plans, weekly reports, monthly reports and the Final Report.

8.6 RECURRING DELIVERABLES

This Chapter describes recurring deliverables that will be prepared during performance of work under the Charlie contract. Recurring deliverables include weekly status reports.

8.6.1 Weekly Progress Report

The PM or his designee will prepare and submit the weekly report prepared IAW DID MR-085 and PWS paragraph 4.10. This report will be submitted to the USAESCH CO and COR not later than the close of business on the first day of the following work week. Weekly reports will only be prepared during periods of fieldwork.

9.0 PROPERTY MANAGEMENT PLAN

Not Applicable.

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10.0 QUALITY CONTROL PLAN

10.1 GENERAL

This Quality Control (QC) Plan has been prepared by TtEC IAW DID MR-005-11, the PWS and Contract W912DY-04-D-0011, Delivery Order 0010 specifications for UXO removal at Fort McClellan, Alabama. All QC documentation will be submitted as part of or as supporting documentation for the Final Report. All QC records and documentation will be kept on-site and made available for USAESCH inspection upon request.

10.2 TTEC PERSONNEL AND QC

All TtEC personnel involved in Fort McClellan operations will implement this Quality Control Plan per DID MR-005-11 and specific TtEC Corporate procedures found in the TtEC CRL. Although the CRL is proprietary, the PM will make all CRL references available to the Contracting Officer. The CRL procedures applicable to the Quality Control effort are listed in Table 10-1.

Table 10-1. Tetra Tech EC Corporate Procedures

Procedure Number	Subject
PO-8	Document Control
QPM-1	Quality Program Manual
QP-3	Qualification/Certification Quality Program Audit Personnel
QP-9	Construction Quality Control
QP-10	Control of Measuring and Testing Equipment
QP-11	Control of Nonconforming Conditions
QP-12	Corrective Action
ENG-3	Developing and Issuing Engineering Documents
QP-14	Lessons Learned Procedure

10.3 DUTIES AND RESPONSIBILITIES

10.3.1 UXO Quality Control Specialist (UXOQC)

The UXOQC is independent from the PM and reports directly to the UXO Quality Control Program Manager. Although the UXOQC is separate and independent from the Project Manager, he is part of the problem resolution process and must maintain close and open communication with the PM. The UXOQC is responsible for:

- Issuing Stop Work Requests when conditions warrant.
- Implementing the Quality Control Plan.
- Conducting quality control indoctrination training for project personnel and for site visitors.

- Initiating QC surveillance and inspection consistent with project QC Plan and program QC policies and procedures.
- Identifying, evaluating, initiating, and approving corrective action to ensure work complies with the contract.
- Instituting Field Change Requests and Nonconformance Reports.
- Recommending changes to the Quality Control Plan.
- Providing weekly project QC update to PM.
- Directly communicating with client QA project oversight.
- Conducting inspection and surveillance activity.
- Completing reports and other documentation; maintaining a daily log of activities.
- Implementing the three-phase control process: preparatory, initial, and follow up inspections.
- Implementing the operator proficiency test prior to project operations.

10.3.1.1 Stop Work Authority

The UXOQC has the authority to stop-work whenever a condition is identified that has a negative effect on the quality of the product we are delivering.

10.3.1.2 Stop-Work Request

A Stop-Work Request may be issued for a portion of a process, limiting the Stop-Work Request to that portion of the process that is not in compliance. The UXOQC will document the situation and communicate the issue to the PM and UXO QC Program Manager. The UXOQC will document this action on the Stop Work Request Form and will maintain a compilation of the stop work actions on the Stop Work Request Log.

10.4 AUDIT PROCEDURES

Audits will be conducted and Audit records maintained per TtEC Procedure QPM-1: Quality Program Manual. Audits will be conducted by personnel qualified IAW TtEC Corporate Procedure QP-3: Qualification/Certification of Quality Program Audit Personnel.

10.5 QUALITY CONTROL PROCESS

Quality Control/ Quality Assurance on this project will be a Three Tier Process. This Three Tier approach utilizes the three phases of control inspections terminating with Anomaly Resolution to ensure all project objectives have been met. The first step (Tier 1) of the QC/QA process incorporates the initial project team training captured in the Preparatory Phase Inspection and the execution of the Geophysical Proveout and operator proficiency test that is conducted prior to project operations. This is followed by the second step, (Tier 2) Process Quality Control. Process Quality Control completes the three-phase control process by conducting Initial, and Follow-Up Inspections on all the definable features of work (DFW) to ensure processes are in control and opportunities for improving processes are captured and implemented. QC checks are built into the DFW to monitor and catch potential problems before the process goes to the next

step. The last step (Tier 3) is Product QC which is carried out using the anomaly resolution process to verify the product meets the requirements of the Work Plan. Personnel conducting Quality Control/ Quality Assurance have stop-work authority and are organizationally independent from the processes.

10.6 TIER 1 QC PROCESS

10.6.1 Training

The UXOQC will verify site personnel have the following training as required:

- Qualification per Technical Paper 18 for the position assigned;
- 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Course;
- 8 Hours HAZWOPER Annual Refresher Course if applicable;
- Site Specific Quality Control procedures and pass/fail criteria; and
- On-Going QC Training.

The UXOQC will conduct periodic quality related briefings during the morning safety meeting. These briefings will cover quality related topics provided by the UXO QC Program Manager and as determined by the UXOQC. Suggested topics include, but are not limited to, results from QC activity such as surveillance, inspections, the three-phase control process, process improvement, changes to procedures and approved FCRs.

10.6.2 Preparatory Phase Inspections

10.6.2.1 Timing of Preparatory Phase QC

A preparatory phase inspection will be performed prior to beginning each definable feature of work. Definable features of work will include:

- Survey;
- Surface Clearance;
- Vegetation Cutting;
- Digital Geophysical Mapping;
- Analog Geophysical Mapping;
- Anomaly Reaquisition;
- Intrusive Investigation;
- MEC Disposal;
- MPPEH Processing and Disposition; and
- Data Management.

The purpose of this inspection is to review applicable specifications and verify the necessary resources, conditions, and controls are in place and compliant before start of work activities. The preparatory phase inspection will be scheduled and conducted by the UXOQC and attended by the PM, SUXOS, UXOSO, and all team members of the process for which the preparatory inspection is being conducted. The personnel responsible for the work activity are responsible for ensuring that:

- Appropriate plans and procedures are developed and approved.
- Personnel required for the activity are identified and positions filled.
- Training requirements are identified and training complete.
- Preliminary work and coordination has been completed.
- Equipment and materials required to perform the work have been identified and are available.

The specific QC activities performed during the preparatory phase, and results of those activities, will be documented on the Preparatory Phase Inspection Report, which will be attached to the Daily Quality Control Report. Any checklists used during the preparatory inspection will be attached to the Preparatory Phase Inspection Report. These report forms are in Appendix F.

10.6.2.2 UXOQC Actions in Preparatory QC Phase

The following QC actions are performed by the UXOQC for each preparatory phase inspection:

- Verify that appropriate plans and procedures are developed, approved and available.
- Verify personnel identified are available and meet the requirements and qualifications of DDESB TP18 for the position.
- Verify that the required training has been performed and is documented.
- Verify identified equipment is available, functional, and appropriate for the job.
- Verify that the preliminary work and coordination have been accomplished.
- Verify that level of quality expected is understood.
- Verify that Work Plan and applicable SOPs have been reviewed and understood by the workers.
- Brief process improvement program.

10.6.2.3 Training

Each operator will be trained on the data requirements and instrument selected to meet the project objectives. The training will include all performance requirements per task, the required maintenance/calibration necessary for the equipment as recommended by the manufacturer. The performance requirements are outlined in Table 10-4.

10.6.2.4 Discrepancies

Discrepancies between existing conditions and approved plans/ procedures will be resolved and corrective actions taken for unsatisfactory and nonconforming conditions identified during a preparatory phase inspection.

10.6.2.5 Job Hazards

The UXOSO will discuss job hazards with site personnel and verify that the necessary safety measures are in place and ready for use.

10.6.3 Analog Operator Instrument Proficiency Test

To ensure operator proficiency and quality data is collected, a operator instrument proficiency test will be conducted on the hand-held geophysical instruments that will be used for project operations. This activity will be documented as part of the Preparatory Phase Inspection on the Individual Operators Proficiency Test Sheet contained in Appendix F. The procedures outlined in section 5.12 will be followed.

The TtEC test regimen and anticipated performance metrics includes the following:

- Acquisition personnel metal check (ensure no metal on acquisition personnel);
- Adequate lane coverage with instrument; and
- Detection of all seed items in test strip for analog instrument operators.

The operator will receive either a Go/No Go grade for this operator instrument proficiency test. The test procedures outlined will be documented on the Individual Operator Proficiency Test Sheet and a report with the results from all the instrument operators will be compiled on the Operator Proficiency Test Report also contained in Appendix F.

10.7 TIER 2 QC PROCESS- PROCESS QUALITY CONTROL

This component of the QC function is an integral part of each process and will be managed by the UXOQC, who will work closely with the project manager and the field supervisors to identify and meet project and quality objectives. Identified quality criteria for the inputs and outputs of each process will be identified and used as a basis for the assessment of each process.

Process QC completes the three-phase control process by conducting Initial, and Follow-Up (Surveillance) Inspections to ensure that processes are under control, and opportunities for improving processes are captured and implemented. Use of proactive process QC is a preventative approach to quality.

10.7.1 Initial Phase Inspection

An initial phase inspection will be performed by the UXOQC the first time a definable feature of work is performed. The purpose of the inspection will be to check the preliminary work for compliance with procedures and contract specifications. Another aim is to establish the acceptable level of workmanship, check safety compliance, review the preparatory phase inspection, and check for omissions and resolve differences of interpretation. The Initial Phase Inspection Report is in Appendix F.

10.7.2 Initial Phase Actions

The following actions will be performed for each definable feature of work:

- Verify that deficiencies identified during the preparatory phase have been corrected.
- Requirements of quality of workmanship will be established.
- Differences of interpretation will be resolved.
- Work Plan and applicable documents will be reviewed to ensure that the requirements are being met.
- Performance of work will be observed and adequacy of work verified.

10.7.3 Discrepancies

Discrepancies between site practices and approved plans/procedures will be resolved. Corrective actions for unsatisfactory conditions or practices will be verified by the UXOQC, prior to granting approval to proceed.

10.7.4 Documentation of Initial QC Phase Actions

The specific QC activities performed during the initial QC phase, and results of those activities, will be documented on an Initial Phase Inspection Report and attached to the Daily Quality Control Report. These report forms are in Appendix F.

10.7.5 Follow-up Phase Inspection (Surveillance)

The UXOQC will conduct the follow-up phase inspection on a scheduled and unscheduled basis. The purpose of the inspection is to ensure continuous compliance with contract requirements, SOW, Standard Operating Procedures (SOPs) and to verify the quality of workmanship. The following will be performed for each definable feature of work:

- Inspections/surveillance to ensure that the work is in compliance with the SOW and the Work Plan.
- Inspections/surveillance to ensure the required level of workmanship is maintained.
- Inspections/surveillance to ensure each project logbook is properly filled out and maintained.
- Inspections/surveillance to ensure data management system is properly tracked and backed up.
- Follow-up results, either negative or positive, will be documented on a QC Surveillance Report

and attached to the Daily Quality Control Report.

- Table 10-2 provides a surveillance inspection frequency list.

10.7.6 Blind Seeding

To assist in meeting the preceding performance goals, TtEC will implement a seeding program per Section 7.0 of the PWS for additional assurance that the DGM data and analog mapping processes are of sufficient quantity and quality to meet the project objectives. The seed program will address the PWS performance requirements for dynamic positioning and dynamic detection for DGM methods, and coverage, and detection and recovery for analog instruments. The QC geophysicist and UXOQCS will review the completed dig sheets and geophysical data for the seed items emplaced in the grids to ensure that the performance standards for these requirements are continuously achieved during the duration of the project. It is anticipated that a minimum of one seed item per grid will be emplaced for DGM methods and six will be emplaced for the analog instrument grids (depending on field crew size). The grid corner nail may be used for the DGM dynamic seed item. Based on an anticipated analog method team size of 6 operators, three coverage seed items and three detection and recovery seed items will be placed in each analog method grid. There will be at least one of each detection and recovery seeds (37mm and 75mm) in each analog grid. The GIS determined grid system in conjunction with the slope analysis will be used to determine which grids will be seeded for DGM methods and which grids will be seeded for analog methods. The UXOQC staff will emplace and record the location of all seed items on the Seeding Checklist contained in Appendix F.

Table 10-2
Surveillance Inspection Frequency

Task	100%	Daily	Weekly	Bi Weekly	Monthly	As Needed
Safety and Health Plan Compliance		X[3]				
Class V Storage/ Accountability			X[2,4]			
Documentation Control/ Data Management/GIS			X[2]			
Instrument Prove-Out			X[2]			
Excavation Activities			X[2,4]			
Demolition Operations			X[2,4]			
Surveying Operations			X[2,4]			
Surface Clearance			X[2,4]			
Digital Geophysical Mapping			X[2,4]			
Analog Geophysical Mapping			X[2,4]			
Data Management			X[2]			
Vehicle Inspections/ Preventive Maintenance				X[2]		
Communications Effectiveness/ Equipment Inspection				X[2]		
Management of Project Equipment					X[2]	
Safety Inspections					X[1,2]	
Physical Security (After hours)						X[2]
Personnel Qualifications/ Site Specific Training	X[2]					
Visitor Briefing						X[3]
Accident/Incident Reporting	X[1,2]					
MEC/Scrap Management			X[2,4]			
Explosives – UXO/MEC Transportation						X[2]
Brush Clearance			X[2,4]			X[2,4]
Project Plans Management (FCR)						X[2]
Hazard Assessment – Risk Analysis						X[2]

Notes:

1. EHS Procedure 3-3 requires a documented weekly inspection by the ESS, Accident/Incident reporting will be documented iaw EHS Procedure 1-7
2. Observations will be documented on a QC Daily Report and Surveillance Report as required.
3. Document on Daily Report
4. Three Phase Inspection Conducted (Preparatory, Initial, Follow-on Inspections)

10.7.7 Equipment Calibration, Testing and Maintenance Requirements

Each piece of equipment will be listed according to make, model, and serial number on field data sheets. Checklists of equipment tests and calibrations will be filled out and retained in the project files. In addition, calibration and testing procedures may be stored on magnetic media or in field logbooks. If equipment is sent to the manufacturer for repair or maintenance, it will be recalibrated. Documentation of any recalibrations will be maintained in the project files.

10.7.8 Daily Instrument Checks

Every instrument operator will check the instrument daily for proper function. The operator will test the instrument on known anomalies at the target depth in the test area. If the instrument does not function properly IAW manufacturer's criteria, the instrument operator will deliver it to the TtEC project office and request repair as well as a replacement instrument. Daily instrument checks will be documented in the team logbook and the Daily Instrument Prove-Out Report. The UXOQC will verify daily instrument checks during QC surveillance activity. See Table 10-3 for a breakdown of equipment inspection requirements.

Table 10-3
Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Equipment	Operational Checks	Frequency	Responsible Person	Acceptance Criteria	Corrective Action
Schonstedt, Vallon, White, Minelab	Battery Strength Test	2 times/day	Operator	Audio response over ferrous object	Replace batteries; re-work if necessary
	Standardization Check	At start of operations	Operator	Audio response over GPO standardization item	Assess/correct instrument set-up (cables, settings); perform instrument maintenance; replace unit; re-work if necessary
RTS, Constellation	Locational Accuracy	Start and end of operations, Prior to Reacquiring in a grid	Operator	±2 inches at known monument, ±12 inches at grid corner points	Perform instrument maintenance and, if discovered after operations, identify affected points to re-survey at a later date

10.7.9 Records

The UXOQC will maintain calibration and maintenance records concerning instrument calibration, maintenance and operator qualification at the TtEC project office. These records will be part of the QC record. All field teams will maintain a logbook to document individual field team's activities.

10.7.10 Maintenance

The SUXOS will supervise the maintenance and inspection of all other equipment to include vehicles, radios, monitoring equipment, and Personal Protective Equipment. The UXOQC will maintain the records for all such maintenance and inspection in the TtEC project office.

10.7.11 QC Records

The UXOQC will maintain all QC records including instrument calibration /maintenance records, instrument operator qualification records, training certificates, vehicle maintenance records, etc., in the TtEC project office for examination by the OE Safety Specialist and other Government representatives.

10.7.12 Digital Geophysical Mapping QC

QC for digital geophysical mapping is covered in Section 6.7 of this WP.

10.7.13 Land Survey QC

Surveying and field layout activities will be performed IAW Chapter 7.0 of this Work Plan and DID MR-005-07.01. The theory and implementation of surveying activities will follow standard survey practices. The work will be checked by direct and indirect methods whenever possible (i.e., work laid out to one set of controls will be checked back to an independent set of controls). The UXOQC will verify compliance with DID MR-005-07.01 through the three-phase control process and on-going QC surveillance.

10.7.14 Layout of Work

Layout of the work will be from established base lines and benchmarks indicated on existing site drawings. Where no base lines or benchmarks are provided, the establishment of reference benchmarks and base lines will be documented in the surveying field books. Any control lines established for the purpose of layout or checking the location of permanent components of the work will be documented in the surveying field books IAW standard surveying practices.

10.7.15 Survey Equipment Check

Prior to use on-site, surveying equipment will be checked for accuracy via standard surveying practice. Calibration of equipment, where applicable, will be verified to be current, and will be maintained current during use of the equipment on the project. After being placed in service, surveying equipment will be checked prior to further use if subjected to unusual shock, if dropped, or if the accuracy is suspected to be out of tolerance for any reason. Surveying equipment will be checked periodically IAW standard surveying practice. Field books used for recording layout and control will be routed to the UXOQC when completed. These field books will be retained as project records.

10.7.16 Geographic Information Systems (GIS) QC

The UXOQC will ensure requirements of DID MR-005-07.01 are being met. This will be done by applying the three-phase control process and on-going QC surveillance. Additional QC for this task is presented in Section 7.6.

10.7.17 Subcontractor QC

Subcontractors performing work on the project will be responsible for compliance to the requirements of their respective subcontract. TtEC has overall responsibility for maintaining conformance to the quality requirements of the contract, including responsibility for subcontracted items and services. The requirements for personnel qualifications, technical performance levels, QC procedures, acceptability levels, and documentation will be included as part of the subcontract documents.

10.7.18 Document Control

The PM will establish a document control plan IAW TtEC Procedure PO-8, Document Control. Preparation, review, approval, and issuance of documents (including revisions) affecting quality will be controlled to the extent necessary to determine the documents include the specified requirements and provide adequate procedures or guidelines to perform the intended activities. Such documents may include, but are not limited to, drawings, specifications, calculations, procedures, plans, and reports. The UXOQC will review the documents to verify the inclusion of appropriate quality requirements.

10.7.19 Data Management

The UXOQC will implement a three-phase control process to ensure quality data management processes and on-going QC surveillance. Additional QC for this task is presented in Section 7.6. See Table 10-4 for quality inspection points.

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Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
SURVEY	Survey Stakes	• 18in. wooded stake placed at a height no greater than 12 inches above ground surface. • Metal Nail with washer placed adjacent to corner stake. • Stake painted orange or marked with flagging material and marked with proper ID in permanent ink.	Sections 2.6.1.1/ 7.3	• QC Specialist will: • Communicate all requirements listed in table during the Site Specific Training and Preparatory Phase Inspection. • Verify location consistency between all primary control points and monuments (office and field checks). • Verify coordinate system and units as required from SOW. • Require grid corner points from survey subcontractor in the appropriate coordinate system if necessary. • Require "true" horizontal and slope distance measurements for control points from survey subcontractor depending upon positioning system used. • Visually inspect field work. • Verify existence of corner stakes and the emplacement of metal nails washers are present. • Verify stakes marking is legible and correct. • Verify Field notes, logbooks and documentation are accurate, complete and consistent.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Personnel Requirements	• Registered Land Surveyor-Boundary/ Grid setout. • UXO Tech II – MEC Avoidance.	Sections 2.6.1.1/ 7.0/ 7.2		
	Datum	• AL State Plane NAD 83 / FT.	Sections 2.6.1.1/ 7.1		
	Control Points Accuracy	• Horizontal Accuracy • ≤ 2in for known control point. • ≤ 12in for temporary control point.	Section 7.3.1		
	Boundary Survey Grid/ Setout Accuracy	• Horizontal Accuracy • ≤ 12in for boundary and grid points.			
	Maps of each area	• 1in = 50 FT (1:600).	Section 7.3.3		
	Site Map	• 1 in = 1:200 ft (1:2400).			

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
	Monuments	• Monuments will be identified with brass, bronze or aluminum alloy caps. • Will be stamped in a consecutively numbered sequence. • Dyes the monument caps will be between 1/8-inch to 3/16- inch in size. • All coordinates and elevations will be shown to the closest one-hundredth of a foot (0.01 ft).	Section 7.3.2		
	Daily Instrument Check	• Start and end of operations. • ±2in at known monument, ±12in at grid corner points.	Section 10.7.8		
	Documentation	• Log Books / Field Notes.	Section 10.7.9/ 10.7.15		
SURFACE CLEARANCE	Daily Testing	• Daily instrument checks at test strip, operator locates all items in the test strip. • Battery Strength Test 2 times/day receive audio response over ferrous metal object.	Section 2.7.2/10.13.2 Table 10-3	• QC Specialist will: • Verify daily testing of instruments are conducted and documented. • Verify all metallic debris from the ground surface is removed prior to the geophysical survey. • Verify all ordnance hazards have been removed from the area selected to be cleared. • Verify proper handling of MPPEH to include field team inspection, segregation, transportation, and storage. • Verify Field notes, logbooks and documentation are accurate, complete and consistent.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Coverage	• Mark 5 foot wide lanes with PVC pin flags, rope or traffic cones to facilitate 100% coverage. • Field personnel clear the entire lane.	Section 2.6.1.2		
	Procedure	• Remove all cultural and target debris.	Section 2.6.1.2		
	MPPEH / Scrap Handling	• Inspect, Segregate, Transport, and Storage.	Section 2.6.1.2.1/ 2.6.3.8 SOP5		

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
	Documentation	• Document all equipment test conducted. • Record all MEC items found on the MEC Accountability Form. • Record the quantity in pounds of scrap removed from each grid and general comments on the type of scrap. • Log Books / Vehicle Inspection / Field Notes.	Section 2.6.1.2/ 2.7.2/ 10.7.9		
VEGETATION REMOVAL	Performance Requirement	• Remove trees if ≤ 4" at chest level. • Brush trimmed 4"-6" from ground Surface. • Overhanging branches trimmed 8ft.	Section 2.6.1.3	• QC Specialist will: • Assure and verify that all trees ≤ 4" at chest level are removed and that overhanging branches have been trimmed to allow adequate room for the positioning sensor. • Assure and verify that the ground surface of the grid has been cleared of all trimmings and dead fall. • Verify Field notes, logbooks and documentation are accurate, complete and consistent.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Safety Requirement	• Safety Observer will be utilized to during operation.	Section 2.6.1.3		
	Documentation	• Log Books / Vehicle Inspection / Field Notes.	Section 10.7.9		
DIGITAL GEOPHYSICAL MAPPING	Daily Testing	• Vibration/Cable Shake Test (< 2 milli-volt [mV] variation in channel 2 readings). • Static Geophysical Sensor Check (position ≤ 12 in). • Along Line Sample Rate (98% ≤ 10 in).	Section 6.7.1	• QC Specialist will: • Verify Performance requirements are met. • Verify daily testing of instruments are conducted and documented. • Review maps of all areas of concern to	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
	Per Data Acquisition Session	• Kinematic geophysical sensor repeatability (linear metal item chain/pole) lined up to ≤ 12 in). • Kinematic positioning repeatability (linear metal item (chain/pole) lined up to ≤ 12 in. • Repeat a line (repeat a data line within 20% of original values after drift corrections).		ensure completeness. • Verify that grid corner stakes, perimeter stakes and/or way point stakes are correctly marked on maps. • Verify Geo/target anomaly maps are in color, have state plane coordinates, north arrow, distance scale, mV scale and anomaly numbers. • Verify Field notes, logbooks and documentation are accurate, complete and consistent and all pertinent activities at the geophysical survey site are logged.	action will be developed.
	Coverage Requirement	• Coverage (>95% of survey area covered at maximum allowable line spacing of 3.3 feet).			
	Documentation	• Log Books / Vehicle Inspection / Field Notes.	Section 10.7.9		
ANALOG GEOPHYSICAL MAPPING	Instrument Test Strip	• All AGM operators must process through the Instrument Test Strip prior to conducting AGM Operations. • Operator must detect all seed items.	Section 5.12	• QC Specialist will: • Verify daily testing of instruments are conducted and documented. • Check holes along fence lines to ensure clear of MEC. • Verify Intrusive team is utilizing proper sweep techniques including walking speed and instrument sweep pattern and speed. • Verify proper handling of MPPEH to include field team inspection, segregation, transportation, and storage. • Verify all documentation is completed and correct and it is consistent with requirements. • Ensure lot size for analog grids will be 4 grids (~1 acre). • Recheck a minimum of 10% of the grid to verify all detectable anomalies have been investigated. • Check for acceptable back fill of holes.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Daily Testing	• Daily instrument checks at test strip, operator locates all items in the test strip. • Battery Strength Test 2 times/day receive audio response over ferrous metal object.	Section 2.7.2/10.13.2 Table 10-3		
	Performance Requirement	• Mark 5 foot wide lanes with pin flags, rope or traffic cones to facilitate 100% coverage. • Utilization of plastic pin flags to mark target locations and remove all target items at flagged locations. • Detection and removal of all seed items. • Backfill excavations.	Section 2.6.2.1 /2.6.3.2/ 2.6.3.3		
	MPPEH / Scrap Handling	• Inspect, Segregate, Transport, and Storage.	Section 2.6.1.2.1/ 2.6.3.8/2.6.3.9/		

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
			2.6.3.10 SOP5		
	Documentation	• Document all equipment test conducted. • Record all MEC items found on the MEC Accountability Form. • Record the quantity in pounds of scrap removed from each grid and general comments on the type of scrap. • Record the number of digs. • Log Books/Vehicle Inspection/Field Notes.	Section 2.6.3.5/ 10.7.9		
ANOMALY REACQUISITION	GPO	• Anomaly reacquisition teams must successfully process through GPO prior to conducting Anomaly Reacquisition Operations.	Section 5.10/ 6.5	• QC Specialist will: • Verify data is loaded onto the positioning system in the correct format and the filename is consistent with the dig sheet nomenclature. • Verify Team is reacquiring at least one known control point prior to reacquiring any anomalies (e.g., grid corner, geodetic control point, etc.) and check if the off set from the known point is within tolerance specified in WP per grid. • Verify Targets are relocated and flagged in the field with the correct ID from the dig sheet and placing them in the ground far enough to prevent them from coming out. • The reacquired location is digitally recorded by the positioning system with the same target ID that is present on the dig sheet. • Check a % of the reacquired versus	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Daily Testing	• Start and end of operations and prior to reacquiring in a grid the locational accuracy must be; • ±2 inches at known monument • ±12 inches at grid corner points.	Table 10-3		
	Performance Requirement	• Load target anomalies onto the positioning system in the correct format and ensure filename is consistent with the digsheet nomenclature. • Place a non-metallic pin flag marked with a unique anomaly identification (ID) at target location far enough in the ground to prevent them from coming out. • Record the position of the reacquired point to assist in the anomaly resolution step of QC.	Section 2.6.2.4/ 6.5		

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
	Documentation	• Log Books / Vehicle Inspection.	Section 10.7.9	interpreted coordinates to ensure within tolerance specified in WP. • Verify project team communication effectiveness.	
INTRUSIVE INVESTIGATION	Daily Testing	• Daily instrument checks at test strip, operator locates all items in the test strip. • Battery Strength Test 2 times/day receive audio response over ferrous metal object.	Section 2.7.2 Table 10-3	• QC Specialist will: • Verify Target Locations are being checked a final time by the Team Leader or designee and team executing proper dig depth. • Check for acceptable back fill of holes. • Verify feedback protocols are implemented. • Verify proper handling of MPPEH to include field team inspection, segregation, transportation, and storage. • Ensure validation of the dig results are being implemented (ensures all anomalies are excavated and validated based on the size of the item recovered compared to the geophysical signature). • Verify Field notes, logbooks and documentation are accurate, complete and consistent. • Ensure lot size for DGM areas will be 8 grids (~ 2acres). • Re-inspect a total of 10% total anomalies within the lot.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Performance Requirements	• Clear 2 ft radius around each flagged location. • Team Leader Verification Check. • Backfill excavations.	Section 2.6.3.2 /2.6.3.3 Table 10-3		
	MPPEH / Scrap Handling	• Inspect, Segregate, Transport, and Storage.	Section 2.6.1.2.1/ 2.6.3.8/2.6.3.9/ 2.6.3.10 SOP5		
	Documentation	• Document all equipment tests conducted. • Record all MEC items found on the MEC Accountability Form. • Record all anomaly information on Intrusive Investigation Data form. • Log Books/Vehicle Inspection.	Section 2.6.3.5/ 10.7.9		

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
MEC DISPOSAL	Performance Requirements	• Vehicle Inspections/Checks. • Pre-operational check on Remote Firing Device (RFD). • Coordination and Notifications. • EZ Establishment. • Evacuations and Road Closures. • Safety Briefs. • Proper Receipt/Turn-in of Explosives. • Communication Checks. • Safety Warnings. • MPPEH/Scrap Post disposal inspection and segregation.	Section 2.6.3.6/ 3.6.2/3.8 SOP1, SOP2, SOP3, SOP4, SOP5	• QC Specialist will: • Verify vehicle checks completed. • Verify all pre-operational checks completed. • Verify evacuation, and EZ establishment. • Verify communications and safety warnings. • Verify proper handling of MPPEH to include field team inspection, segregation, transportation, and storage. • Verify Field notes, logbooks and documentation are accurate, complete and consistent.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/ corrective action will be developed.
	Documentation	• Log Books. • Magazine Inspection Log. • Inventory Lot log. • Magazine Inventory Cards. • Vehicle Inspection. • MEC Accountability.			
MPPEH PROCESSING AND DISPOSITION	Performance Requirements	• 100% inspection by 2 UXO qualified technicians. Tech III and a Tech II in the field. • MPPEH will be vented/disposed then re-inspected. • Munition Debris, Range Debris, Cultural Debris once inspected and deemed free of explosive hazard will be painted white and transported to storage area then segregated and placed in separate drums or bins/roll offs. • 100% certification inspection by SUXO.	Section 2.6.3.8/2.6.3.9/ 2.6.3.10 SOP5	• QC Specialist will: • Verify proper handling of MPPEH. • Re-inspect 10% of MDAS to ensure items are safe. • Verify Field notes, logbooks and DD Form 1348-1A documentation are accurate, complete and consistent.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.
	Documentation	• Final Inspection / Documentation 1348/ Chain of Custody. • Log Books / Field Inspection / Field Notes.			

Table 10-4
Quality Inspection Points

DEFINABLE FEATURE OF WORK	INSPECTION POINT	REQUIREMENT	REFERENCE WP/SOP	QC PROCEDURE	CORRECTIVE ACTION CRITERIA
DATA MANAGEMENT	Performance Requirement	• Raw geophysical and position data for each data acquisition session will be supplied to the client no later than 24 hours after the data are collected in ASCII format. • Final processed data shall be in ASCII formatted files and native geophysical processing software formats (e.g. Geosoft GDB). • Final processed geophysical data will be drift corrected and will be the dataset used for the interpretation. • File size will be limited to 100mB or 600,000 lines. • Processed data will be delivered on a weekly basis at a minimum. • All survey, dig sheet, reacquisition, intrusive and QC data will be stored in MS Access and will be delivered with each data submittal weekly. • The geophysical data will be presented on maps and will include the color contoured EM data, anomalies marked with symbols, grid lines, map scale, title block, and legend. • Data acquisition/ related paperwork and digital acquisition files are maintained to ensure their repeatability and accuracy. • Project Files are maintained to ensure the data is traceable/repeatable and accurate. • All digital data will be backed-up each night and stored in a secure place.	Section 5.8/ 6.2.6	• QC Specialist will: • Verify performance requirements are met. • Verify data acquisition log is established and maintained (preferably digital). • Verify processing/interpretation log is established and maintained (preferably digital). • Verify the file management system will include team id, date, survey area, and file designator so that there are no duplicate file names. • Ensure data are stored by date, and that the original raw data are NEVER compromised; copy raw data to "process" folder" prior to processing. • Ensure that files stored by date are "merged" as necessary into grids or transects that are more readily useable by other project personnel (PM, client, etc.). • Verify the processing and analysis efforts are documented in the appropriate digital files (e.g., TtEC *.chk, Oasis *.log). • Verify the Geophysical data is in the coordinate system(s) AL State Plane NAD 83 / FT as required by the client. • Verify Field notes, logbooks and documentation are accurate, complete and consistent. • Verify data backups are completed. Verify submittals are sent to client at required intervals. • Review the intrusive data and compare the information with the geophysical data characteristics to ensure consistency between the results.	Any element not conforming to the specifications. Where appropriate, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.

10.8 TIER 3 PRODUCT QC

The Fort McClellan Project will use the anomaly resolution process for product QC. Anomaly resolution for grids mapped using DGM methods will be accomplished by checking selected anomalies with an EM61 after intrusive operations are complete for each lot. The rate for this inspection will be 10% of total digs in each lot. The UXOQCS will check open holes in areas where analog methods were used using the same basis for calculations and the same instrument utilized by the field team.

The results of the re-screening will be compared with the following:

Accept: 1) Zero ferrous metal items equivalent to, or greater than, 37mm in diameter recovered in the Bains Gap Range, Range 20, Range 24A or 81mm in diameter recovered in the 81mm range area. 2) Inert MEC seeds and simulated MEC seeds detected, and their locations interpreted within a 25 inches of their burial points, and selected for placement on dig lists. The grids will then be acceptable for handover; or

Reject: 1) One or more ferrous metal items equivalent to, or greater than, 37mm in diameter recovered in the Bains Gap Range, Range 20, Range 24A or 81mm in diameter recovered in the 81mm range area. 2) Inert MEC seeds and simulated MEC seeds not detected, and their locations interpreted outside 25 inches of their burial points, and not selected for placement on dig lists. The grid will then be reworked and resubmitted for acceptance inspection.

The project QC geophysicist and UXOQCS will review the intrusive data and compare the information with the geophysical data characteristics to ensure consistency between the results. Should intrusive results diverge significantly from interpretation data (e.g., “no find” percentage exceeds 15% as a running average for the project, inconsistency between the geophysical anomaly characteristics and the size and material properties of the item(s) excavated), a root cause will be conducted to evaluate the components of the relevant processes involved. This procedure will ensure that the disparity between the results is minimized for subsequent intrusive grids investigated. The geophysical investigation components that will be evaluated include those associated with data acquisition (coverage, density, quality, noise levels, positioning), data processing (merging of sensor data and position data, background shifts), and data interpretation (anomaly selection, computer calculations for location and estimated depths). The procedures for target reacquisition will also be evaluated. Corrective measures will be implemented, as necessary, to ensure that subsequent interpretive data and/or reacquisition procedures are modified to more accurately reflect ground-truth results.

10.8.1 Lot Determination

Quality control data will be tracked and delivered to USAESCH on a lot based system. The lot sizes will be different for DGM areas and analog method areas due to the limited areas that are expected for analog methods. The initial lot size for DGM areas will be 8 grids (~ 2acres) and for analog grids will be 4 grids (~1 acre). The lot size may be modified after field activities begin to accommodate changes in anticipated field conditions such as high density areas, slope, vegetation, DGM vs. analog. Each lot will be mapped exclusively by one team so that any QC issues can be traced back to a specific team and root cause analysis and corrective actions can be implemented more efficiently.

10.9 DEFICIENCIES AND NONCONFORMANCE

Deficiencies and nonconforming conditions will be managed IAW TtEC Procedure QP-11, Control of Nonconforming Conditions, and QP-12, Corrective Action. Deficiencies discovered during inspection or other Project QC functions will be documented in the Daily QC Report. (See Appendix F.) Nonconforming conditions will be documented on a Nonconformance Report (NCR). (See Appendix F.) All deficiencies will be resolved prior to completion of the project and in the timeliest manner possible. The Daily QC Report will include a report on each deficiency/nonconforming condition and the corrective action that was completed and closed out for the day. A corrective action request is required for deficiencies identified from the following sources:

- TtEC Quality Program Audits;
- Management Assessments;
- Audits performed by Program QA/QC IAW project specific plans; and
- Audits of TtEC, performed by the client or regulatory agency.

10.9.1 QC Responsibilities

It is the responsibility of all personnel on the project to identify deficiencies and nonconforming conditions to their supervisor or manager as soon as they are identified. Deficiencies and nonconforming conditions are not necessarily a “bad thing”, however, they do have a negative connotation. Deficiencies and nonconforming conditions should be considered opportunities to improve the process. The determination of the root cause of a deficiency or nonconformance is an integral part of the QC process. The depth and extent of the root cause analysis depends on the situation. It may be as simple (minor) as an overlooked step or procedure or be a complicated process. Input will be obtained as necessary from field personnel and technical advisors in order to identify the factors, which led to the problem. Root cause analysis is the responsibility of the PM with the assistance of UXOQC. Criteria considered in the analysis will include:

- Staff qualifications and training;
- Adequacy of procedures;
- Adequacy of equipment;
- Adequacy of QC measures; and

- Root Cause.

The root cause is always "upstream" from where the problem was detected. Two strategies that should be employed for determining the root cause of a deficiency for this project are: 1) tracing the problem back to the source, and 2) evaluation of the cause using basic questions such as who, what, when, where, why, and how. Why is probably the most beneficial question when attempting to arrive at a root cause. This question may need to be asked multiple times before the cause is identified. For example "Why did A happen?" Answer: "Because of B," "Why did B happen?" Answer: "Because of C." This process is carried on until the real cause is identified.

10.9.2 Corrective Action

Following the root cause analysis, the UXOQC will perform analysis of potential solutions (corrective actions) to determine which remedy is most effective in correcting the problem. The process will include all appropriate personnel and will be documented via meeting notes and information listed in the proper sections of both the Nonconformance Report form and the Corrective Action Request form. Potential remedies considered may include:

- Supplemental personnel training;
- Changes of equipment or modification of equipment currently in use;
- Acquisition of supplemental equipment;
- Implementation of new procedures or modification of existing procedures;.
- Rework the deficient process or a portion of the process;
- Changes in QC procedures; and
- PM Role.

The decision for appropriate corrective action to implement is the responsibility of the PM. However, all parties involved prior to implementation should agree upon this decision. Successful implementation of corrective action will be documented on the Nonconformance Report and tracked. The UXOQC will verify through follow-up phase surveillance that the corrective action implemented has corrected the deficiency or nonconforming condition and is sufficient to prevent recurrence.

10.10 LESSONS LEARNED

Lessons learned will be captured, documented and submitted in the Final Report using TtEC Procedure QP-14 Lessons Learned Procedure. The Lessons Learned Report Form is found in Appendix F. The UXOQC will attach the completed Lessons Learned Report forms to daily and weekly QC reports. The UXOQC will recap all such Lessons Learned in the Final Report.

10.11 CONTROL OF CONTRACT SUBMITTALS

The PM will ensure all contract submittals (Work Plan, Weekly and Monthly Reports, Records of Meetings and Conversations, Accident Reports, etc.) are prepared in strict conformance with the contract specifications. The PM will verify conformance of all submittals with the current Data Item Descriptions.

10.12 CHANGES TO EXISTING DOCUMENTS AND FIELD CHANGE REQUESTS (FCR)

Field Change Requests will be managed per TtEC Procedure ENG-3: Developing and Issuing Engineering Documents. The PM will submit all proposed changes to the ESS and/or Work Plan to the USAESCH PM, who will request concurrence from the Project Delivery Team prior to forwarding to the Contracting Officer for approval. In addition, the SUXOS will conduct training and briefings to all field personnel on the approved changes to these documents at the earliest opportunity. This training on changes to existing documents could be at the daily safety meetings or in a more formal presentation. The Field Change Request is contained in Appendix F.

10.13 EQUIPMENT CALIBRATION, TESTING AND MAINTENANCE REQUIREMENTS

Each piece of equipment utilized at Fort McClellan will be listed according to make, model, and serial number on field data sheets. Checklists of equipment tests and calibrations will be filled out and retained in the project files. In addition, calibration and testing procedures may be stored on magnetic media or in field logbooks. If equipment is sent to the manufacturer for repair or maintenance, it will be recalibrated. Documentation of any recalibrations will be maintained in the project files.

10.13.1 Geophysical Instruments

The UXOQC will use the established GPO test area for tests conducted on the geophysical instruments. DGM instrument tests are discussed in Section 5.8.

10.13.2 Daily Instrument Checks

Every instrument operator will check the instrument daily for proper function. The operator will test the instrument on known anomalies at the target depth in the test area. If the instrument does not function properly IAW manufacturer's criteria, the instrument operator will deliver it to the TtEC project office and request repair as well as a replacement instrument. Daily instrument checks will be documented in the team logbook and the Daily Instrument Prove-Out Report. The UXOQC will verify daily instrument checks during QC surveillance activity.

10.13.3 Records

The UXOQC will maintain calibration and maintenance records concerning instrument calibration, maintenance and operator qualification at the TtEC project office. These records will be part of the QC record.

10.13.4 Maintenance

The SUXOS will supervise the maintenance and inspection of all other equipment to include vehicles, radios, monitoring equipment, and Personal Protective Equipment. The UXOQC will maintain the records for all such maintenance and inspection in the TtEC project office.

10.14 QC RECORDS

The UXOQC will maintain all QC records including instrument calibration/maintenance records, instrument operator qualification records, training certificates, vehicle maintenance records, etc., in the TtEC project office for examination by the OE Safety Specialist and other Government representatives.

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11.0 ENVIRONMENTAL PROTECTION PLAN

This Environmental Protection Plan (EPP) was prepared IAW DID MR-005-12: Environmental Protection Plan. This EPP has been developed to minimize any potential adverse effects to the environment occurring as a result of the MEC/UXO Removal in selected areas of Charlie at Fort McClellan, AL. This EPP describes sensitive natural resources within Fort McClellan and sets forth methods to protect and conserve those resources during MEC activities. Where impacts to sensitive biological resources cannot be avoided, this EPP outlines potential measures that can be implemented to mitigate such impacts. These mitigation measures were developed based upon a site-specific analysis that addresses unique concerns at Fort McClellan and incorporate more general best management practices and guidelines that have been implemented for intensive MEC remediation undertakings at other former military training sites.

11.1 ENDANGERED AND THREATENED SPECIES

Three species listed as endangered or threatened by the United States Fish and Wildlife Service have been recorded on Fort McClellan (Table 11-1). One of these species, the red-cockaded woodpecker, has not been found on the installation since 1968. Two other species, Mohr's barbara buttons and Tennessee yellow-eyed grass have been identified at Pelham Range, but not on the Main Post. However, due to the proximity of Pelham Range to the Main Post, the potential exists that these species may also be present on the Main Post.

Within Alabama, the blue shiner is currently restricted to Weogufka and Choccolocco Creeks as well as the lower reaches of the Little River. Approximately two miles of the Choccolocco Creek flow through the Choccolocco Corridor. The entire length of the stream within this corridor is considered optimal habitat for the blue shiner (DOE, 1996).

Historically, longleaf pine forests on the Main Post were known to contain red-cockaded woodpeckers. The lack of fires coupled with the removal of longleaf pine (as a result of historical land clearing and forestry activities) resulted in the decline of this species. In fact, the last remaining active red-cockaded woodpecker cluster on Fort McClellan was recorded in 1968. Subsequent surveys in 1972, 1982, 1985 and 1997 failed to identify any birds or significant suitable habitat and the cluster was classified as inactive (DOE, 1996).

Table 11-1
Federally Listed Species Occurring on Ft. McClellan

Common Name	Scientific Name	Federal Status	Location
Blue shiner	*Cyprinella caerulea*	Threatened	Choccolocco Creek
Red-cockaded woodpecker	*Picoides borealis*	Endangered	Main Post
Gray Bat	*Myotis grisescens*	Endangered	Main Post
Mohr's barbara buttons	*Marshallia mohrii*	Threatened	See note 1 below
Tennessee yellow-eyed grass	*Zyris tennesseensis*	Endangered	See note 1 below

Source: Fort McClellan Directorate of Environment, 1996
[1]These species have been identified at Pelham Range, but not on the Main Post at Fort McClellan. However, due to the proximity of Pelham Range to the Main Post, the potential exists that these species may also be present on the Main Post.

11.1.1 Other Special Status Species

A total of five species that have been found on Fort McClellan are state candidate species for future potential listing (Table 10-2). When the property belonged to the Army, Fort McClellan pro-actively managed these species and their associated communities as Special Interest Natural Areas under an Endangered Species Management Plan.

Table 11-2
State Candidate Species Identified on the Site

Common Name	Scientific Name	Special Interest Natural Area
Appalachian cottontail	*Syvilagus obscurus*	Mountain Longleaf Community Complex
Diana butterfly	*Speyeria Diana*	Marcheta Hill Orchid Seep
Carlson's caddisfly	*Polycentropus carlsoni*	Bains Gap Seep and Cave Creek Seep
Fraser's loosestrife	*Lysimachia fraseri*	Bains Gap Seep
White fringeless orchid*	*Platanthera integrilabia*	Marcheta Hill Orchid and Cave Creek Seeps
Coldwater darter	*Etheostoma ditrema*	See note 1 below

Source: DOE, 1996
* Expected to soon be listed as a threatened and endangered species.
[1] This species has been identified at Pelham Range, but not on the Main Post at Fort McClellan. However, due to the proximity of Pelham Range to the Main Post, the potential exists that this species may also be present on the Main Post.

The white-fringeless orchid (*Platanthera intergrilabia*) is a federal candidate species. This perennial herb has either a leafy flowering stem 1 to 2 ft (6 dm) tall, or a single, strap-shaped basal leaf, all attached to tuberous, fleshy roots. It flowers mid-July to late August and bears fruit during September-October. It is typically found in red maple/black gum swamps and along sandy, damp stream margins. It also is found on seepy, rocky, thinly vegetated slopes. It is often associated with other orchids, white violets, cowbane, and grass-of-parnassas. A Significant Interest Natural Area is located along the southeast corner of the Bains Gap Removal Area. This area is the Marcheta Hill Orchid Seep. The Range 24a Removal Area is also impacted by a Significant Interest Natural Area. The South Branch Cane Creek and Stanley Hill Chestnut Oak Forest areas overlap the Range 24a Area.

In addition to the species listed above the Mountain Longleaf Pine is located in and around the Bains Gap Road removal area. As the key species in what is the MLNWR now the U.S. Fish and Wildlife Service has asked that special consideration be given to any Mountain Longleaf Pine that are present in the clearance area. TtEC has worked in and around this area and identification of the pine will be included in the site specific training. TtEC's brush removal sub will also be briefed on the pine and will take special care to disturb as few of the pines as possible while still preparing the site for the removal action that will follow.

11.2 WETLANDS

There is a designated wetlands area in the Range 24A Area.

11.3 CULTURAL AND ARCHAEOLOGICAL RESOURCES

There is a designated archeological resources area within the surface clearance portion of the Range 24A area.

11.4 WATER RESOURCES

11.4.1 Surface Water

Cane Creek flows through the Bains Gap Road Removal Area and the South Branch of Cane Creek flows through the Range 24A Removal Area.

11.4.2 Groundwater

There are no anticipated impacts to groundwater associated with this project.

11.5 NOISE

There are no anticipated impacts to noise levels with this project.

11.6 COASTAL ZONES

There are no coastal zones in the four areas identified for remedial action.

11.7 TREES AND SHRUBS

Since the Charlie Area is now the MLNWR, removal of trees will be limited to trees with a diameter of less than 4 inches and at chest level. The old growth stands of mountain longleaf pine, located in the Charlie Area, are some of the few left in the United States. The mountain ecosystem that exists in the Charlie Area is essentially the only one in the United States. Any mountain longleaf pine marked by FWS will not be removed..

11.8 EXISTING WASTE DISPOSAL SITES

There are no known waste disposal sites in the four areas identified for remedial action. Waste generated during MEC actions at the site will be disposed of off-site.

11.9 COMPLIANCE WITH ARARS

Applicable or Relevant and Appropriate Requirements (ARARs) are provided in Table 11-3.

11.10 MITIGATION MEASURES

TtEC will ensure the implementation of the procedures outlined in this EPP to minimize potential impacts to environmentally sensitive resources during field activities. Activities will be conducted in compliance with all applicable Federal and State regulations as discussed in this EPP. Every effort will be made to protect human health and safety, as well as air, water, land, cultural, and biological resources.

11.10.1 Impact Minimization

Impact minimization procedures will include briefing all on-site personnel on applicable health and safety issues as well as the need for minimizing impacts on sensitive biological resources. Whenever possible, methods for avoiding and minimizing potential impacts on the plant and animal species and communities of concern will be stressed during the on-site training.

11.10.2 Endangered and Threatened Species

Chapter 9 of the *Endangered Species Act* prohibits the taking of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Under terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided such taking is in compliance with an incidental take statement. No endangered or threatened species have been found in the four areas identified for remedial action.

Significant Interest Natural Areas are located near the Bains Gap Road Removal Area and the Range 24A Removal Area. These areas will be indicated on maps provided to the field teams. The areas will be discussed at each morning's safety briefing if the teams will be working in those areas.

11.10.3 Wetlands

To protect the designated wetlands area in Range 24A, the area of the wetlands will be indicated on maps provided to field teams. Teams working in and near the wetlands area will be briefed each morning prior to field activities on methods to minimize impact to the wetlands.

Table 11-3. Potential ARARs for MEC Removal

ARAR/TBC	Citation	Description	Applicability or Relevance
Chemical- Specific : None			
Location- Specific			
Archeological Resources Protection Act of 1979	43 CFR Part 7 36 CFR Part 296 32 CFR Part 229 18 CFR Part 1312	Protection of archeological resources on public land.	Potential ARAR for site activities which could impact an archeological resource area.
American Indian Religious Freedom Act	42 U.S.C. 1996	Requires consultation with Native Americans about traditional religious and cultural sites on Federal Lands to protect and provide access to such sites.	Potential ARAR for site activities which could impact a cultural site.
Clean Water Act, Section 404(b)(1) Guidelines	40 CFR 230.10	Establishes criteria for evaluating impacts to waters of the U.S. and sets factors for considering mitigation measures. Outlines the requirements for discharges of dredged or fill material into waters of the U.S.	Potential ARAR for sampling work, placement of equipment, any site removal or backfilling work within tidal areas and wetlands, and for dredge and fill activities.
Endangered Species Act of 1973, as amended	16 U.S.C. 1531	Provides for the consideration of the impacts on endangered and threatened species and their critical habitats.	Potential ARAR for activities in areas where there is considered to be current populations of endangered or threatened species of flora and fauna.
Fish and Wildlife Conservation Act	16 U.S.C. 2901 50 CFR 83	Protects fish and wildlife when Federal actions result in modifications of a water body; requires consultation with U.S. Fish and Wildlife Service and State wildlife agencies to mitigate losses.	Potential ARAR if the work activity is within a conservation area.
Protection of Wetlands	33 CFR 320 et. Executive Order 11990	Requires consideration of impacts to wetlands in order to minimize their destruction, loss, or degradation and to preserve/enhance wetland values.	Potential ARAR for sampling work, placement of equipment and any site removal or backfilling work within tidal areas and wetlands.

Table 11-3. Potential ARARs for MEC Removal

ARAR/TBC	Citation	Description	Applicability or Relevance
Protection of Historic Resources	36 CFR 800	Requires consideration of impacts to historic and cultural resources.	Potential ARAR for site activities which could impact historic and cultural resources.
Preservation of Historical and Archeological Data	16 U.S.C. 469a 33 CFR 66	Requires the preservation of archeological and historical data from destruction or becoming lost.	Potential ARAR for site activities which could impact historic and archeological data.
Native American Graves Protection and Repatriation Act	43 CFR 10	Consultation with Native Americans must occur before excavation of ancestral remains and other items commences.	Potential ARAR for site activities which could impact Native American graves.
Act for the Preservation of American Antiquities	16 CFR 251.50-64 43 CFR 3	A permit must be obtained before excavation of antiquities occurs.	Potential ARAR for site activities which could impact American antiquities.
Protection and Enhancement of Sacred Indian Sites, 1976	Executive Order 13007	Protects the sacred Native American sites.	Potential ARAR for site activities which could impact sacred Indian sites.
Action- Specific			
National Ambient Air Quality Standards	40 CFR 50	Air quality standards for ambient air.	Potential ARAR for any on-site detonation of OE.
Particulate Emission Controls	40 CFR 50.6	Specifies limitations for the emission of particulate matter.	Potential ARAR for on-site soil disturbances which generate dust.
Environmental Effects of Army Actions	AR 200-2 (NEPA – 40 CFR 1500-1508)	States that the need for an Environmental Assessment or Environmental Impact Statement must be evaluated if there is a potential for adverse impacts to the environment.	Potential ARAR for site activities which could require NEPA actions.
Occupational Safety and Health Act	29 U.S.C. 651-667	States that safety and health standards will be enforced during OE removal activities.	Potential ARAR for site activities which may involve OE removal activities.
RCRA Military Munition Rule	62 CFR 6654	Specifies the identification and management of residual munitions.	Potential ARAR for site activities which may involve residual munitions.
Safety and Health Requirements on Conventional Ordnance and Explosives Act	ER 385-1-95	Specifies the responsibilities in regards to safety and health for OE response actions.	Potential ARAR for site activities which may involve OE response actions.

Table 11-3. Potential ARARs for MEC Removal

ARAR/TBC	Citation	Description	Applicability or Relevance
To Be Considered (TBC) Criteria			
Department of the Army Ammunition and Explosive Safety Standards	AR 385-64	Requires Army standards to be implemented for locating, handling, and disposing of munitions.	Potential TBC for site activities which may involve munitions.
Department of Defense Ordnance Safety Standards	DOD 6055.9-STD	Requires that during detection, removal, and disposal of OE there must be specialized personnel attending.	Potential TBC for site activities which may involve detection, removal, and disposal of OE.
Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property	DDESB Memorandum	Specifies requirements for explosive safety submissions for removal actions.	Potential TBC for site activities which may involve explosive safety submissions.
Explosives Safety Policy for Real Property Containing Conventional Ordnance and Explosives	Letter, Department of the Army	Specifies the policy for explosives safety controls on real property containing OE.	Potential TBC for site activities which may require explosive safety controls.

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11.10.4 Cultural and Archaeological Resources

Only one archaeological site that is potentially eligible for inclusion in the National Register of Historic Places (only the Phase I investigation has been completed) has been identified in the remedial activity areas. The site is in the surface clearance area of the Range 24A remedial activity area. Due to the nature of a surface clearance, it is not expected that any impact would occur to the site during the remedial activities, however TtEC will implement procedures to ensure its protection. The site will be discussed in the morning briefing each day when work is planned in the surface clearance area of Range 24A. Employees will be instructed to not disturb the ground in the vicinity of the site or take photographs of the site. In the event that additional cultural and archaeological items are encountered during intrusive or non-intrusive activities, these items will be carefully preserved. TtEC will cease work in that area, ensure the remaining area is not disturbed and notify the USAESCH Safety Specialist, USFWS and the PM for instructions on how to proceed in the area.

11.10.5 Water Resources

Activities performed in the Charlie Area will be conducted such that the discharge of pollutants to the groundwater table will be prevented. Decontamination water and wastewater from temporary facilities will be containerized and disposed of at an off-site facility.

11.10.6 Noise

It is not anticipated that excessive noise will be caused by MEC actions conducted and there are no known sensitive receptors.

11.10.7 Coastal Zones

Fort McClellan is not located in a coastal area. Mitigation of coastal zones is not applicable.

11.10.8 Waste Disposal

This project will include removal of the tire house on Bains Gap Road. Materials present at this location will be evaluated for MPPEH, certified inert and removed from the site for recycling. Prior to beginning removal of the tire house, samples from the soil within the tires will be collected and analyzed for lead to determine if the lead level in the soil is above or below regulatory limits. UXO Technicians will segregate the tires from the soil at the same time inspecting them for MEC prior to placement in rolloff containers. Once the tires are separated, the technicians will inspect the soil for MEC after which it will be placed in separate lined rolloffs. The tires will be transported off site by an ADEM approved vendor for recycling. USAESCH has indicated that the soil may be redistributed at the shooting house site if analyses indicate lead levels are below regulatory limits; however, we anticipate that the soil will be disposed of at an appropriate off-site facility. One soil sample will be collected for every 100 cubic yards of soil and analyzed for TCLP lead by GPL Laboratories in Gaithersburg, Maryland. If the TCLP results indicate the material is non-hazardous, it will be transported by Waste Management to be disposed of at their Three Corners Facility in Gadsden, Alabama. If determined to be hazardous, the soil will be transported to Waste Management's Emelle, Alabama facility for stabilization and disposal.

11.10.9 Burning Activities

TtEC does not anticipate conducting burning activities at Fort McClellan, with the exception of disposal by detonation for destruction of MEC.

11.10.10 Dust and Emission Control

It is not expected that MEC removal actions will cause a significant increase in dust or air emissions and an Air Monitoring Plan is not required for the MEC removal actions. In the event that dust control is indicated, TtEC will take appropriate measures such as watering the site and covering soil piles with tarps.

11.10.11 Spill Control and Prevention

No chemicals, paint, cleaners or hazardous materials will be stored on site. If the excavator on site requires re-fueling, appropriate spill containment will be available in the form of absorbent pads. Material Safety Data Sheets (MSDS) for the equipment fuel, and any other chemical materials used on site, will be kept in the UXOSO's vehicle and will be readily available to the project staff. TtEC will conduct fueling and servicing of all vehicles (except the excavator) off-site to minimize the potential of spills.

11.10.12 Storage Areas

No TtEC materials will be stored at the project site. Therefore, mitigation with regard to such areas will not be required.

11.10.13 Access Routes

Bains Gap road will be closed to public access Monday through Friday from 0830-1530.

11.10.14 Trees and Shrubs Protection and Restoration

Brush clearance will be conducted by TtEC and by a subcontractor familiar with Fort McClellan. . TtEC's brush removal sub will be briefed on the Longleaf Pine and will take special care to disturb as few of the pines as possible while still preparing the site for the removal action. Clearance activities will be conducted to prevent damage to the root systems of any Mountain Longleaf Pines

11.10.15 Control of Water Run-on and Run-off

TtEC will conduct operations that prevent the discharge of pollutants to the groundwater. Sanitation facilities will be portable toilets. The portable toilets will be serviced regularly and the waste disposed of off-site at an approved facility. In all cases, TtEC will minimize soil disturbance to reduce the potential for erosion and water run-off and run-on.

11.10.16 Temporary Facilities

Temporary facilities for this project are limited to a portable toilet. This will be installed during mobilization. This temporary facility will subsequently be removed following the completion of activities, and the staging area will be restored to its condition prior to mobilization.

11.10.17 Decontamination and Disposal of Equipment

Since CWM and industrial chemicals are not anticipated, decontamination is not expected. Any equipment decontamination and disposal will be conducted IAW the Personnel and Equipment Decontamination Procedures outlined in the Accident Prevention Plan, Appendix D.

11.10.18 Minimizing Areas of Disturbance

The areas that will potentially be disturbed as part of the MEC removal actions will be minimized to the extent possible. Special efforts to minimize the disturbance will be made in areas that contain or potentially contain plant and animal species of special concern or their associated habitat. Per SOO Paragraph 3.1, Task 10: Surface Preparation, TtEC will restore all excavated and blast holes to surrounding grade.

11.11 POST-ACTIVITY CLEAN-UP PROCEDURES

As part of the demobilization process, TtEC will ensure all MEC work areas; the project trailer area, the explosives magazines, and the storage trailer are free of trash. In addition, all work and administrative areas will be cleaned of trash on a daily basis.

11.12 AIR MONITORING

If the TCLP results of the chemical analysis indicate hazardous levels of lead contamination, all personnel within the area of impact of work activities at the tire house will be outfitted in Level C PPE with HEPA respirators and Air monitoring (e.g., mini-RAM) will be performed throughout the removal process. Personnel performing these activities will participate in a medical monitoring program (i.e., for lead). The Air Monitoring Procedures are provided in Attachment 5 of the APP (Appendix D).

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12.0 INVESTIGATIVE DERIVED WASTE PLAN

Not Applicable.

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13.0 INTERIM HOLDING FACILITY SITE PLAN

Not Applicable.

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14.0 PHYSICAL SECURITY PLAN

Not Applicable.

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15.0 REFERENCES

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2. 29 CFR 1926.65. Safety and Health Regulations for Construction. 31 August 2001.
3. 49 CFR 178. Specifications for Packaging. 1 October 2000.
4. 27 CFR 555.121. Commerce in Explosives, General.
5. ATF P 5400.7 Federal Explosives Law and Regulations.
6. AR 190-11. Physical Security of Arms, Ammunition and Explosives. 12 February 1998.
7. AR 385-64. U.S. Army Explosives Safety Program. 1 February 2000.
8. DA Pam 385-64. Ammunition and Explosive Safety Standards. 15 December 1999.
9. EM 1110-1-1002 Engineering and Design - Survey Markers and Monumentation 14 September 1990.
10. Army Technical Manual. TM 60A 1-1-31. Explosive Ordnance Disposal Procedures.
11. DOD 4160.21-M. Defense Reutilization and Disposal Manual. August 1997.
12. DOD 4160.21-M-1. Defense Demilitarization Manual. October 1991.
13. DOD 6055.9-STD. DOD Ammunition and Explosives Safety Standards. October 5 2004.
14. DOD. MIL-STD-1916. Department of Defense Test Method Standard. 1 April 1996.
15. Foster Wheeler Environmental Corporation (FWENC), Conventional Explosives Safety Submission, Ordnance and Explosives Removal Action for the Choccolocco Area, U.S. Fish and Wildlife Land Transfer of Fort McClellan, Alabama. August 2003.
16. FWENC, Final Amendment 1 Conventional Explosives Safety Submission, Ordnance and Explosives Removal Action for the Choccolocco Area, U.S. Fish and Wildlife Land Transfer of Fort McClellan, Alabama. January 2004.
17. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-07.01
18. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-05.01
19. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-01
20. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-03
21. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-04.
22. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-11.

23. U.S. Army Corps of Engineers (USAESCH), Data Item Description (DID) Munitions Response (MR) –005-12.

24. U.S. Army Corps of Engineers (USAESCH). EM 385-1-1. Safety and Health Requirements Manual. 3 November 2003.

25. U.S. Army Corps of Engineers (USAESCH). EM 1110-1-4009. Ordnance and Explosives Response. 15 June 2007.

26. U.S. Army Corps of Engineers (USAESCH). EP 385-1-95a. Basic Safety Concepts and Considerations for Ordnance and Explosives Operations. 29 June 2001.

27. U.S. Army Corps of Engineers (USAESCH). EP 1110-1-18. Ordnance and Explosives Response. 3 April 2006.

28. U.S. Army Corps of Engineers (USAESCH). ER 1110-1-8153. Ordnance and Explosives Response. 14 May 1999.

29. U.S. Army Corps of Engineers (USAESCH). Publication Procedures for Demolition of Multiple Rounds (Consolidated Shots) on OE Sites (March 2002).

30. U.S. Army Corps of Engineers (USAESCH). Archives Search Report (ASR) Findings (USAESCH, 2001a).

31. U.S. Army Corps of Engineers (USAESCH). Archives Search Report Conclusions and Recommendations (2001b).

32. Alabama Explosive Safety Act of 1993 (Acts 1993, No. 93-713, § 1.).

33. Remedial Investigation Report, Draft, Bains Gap Road Ranges: Range 24 Upper, Parcel 80Q; Range 21, Parcel 77Q; Range 22, Parcel 78; Former Mortar Range (Firing Line), Parcel 109Q; ad Range 27, Parcel 85Q, May 2004

34. Remedial Investigation Report, Draft, Ranges Near Training Area T-24A, Parcels 187(7), 88(6), 108(7)/82Q-X, 112Q, 113Q-X, 213Q and 214Q, April 2005.

35. Remedial Investigation Report, Final Revision 1, Former 81mm Mortar Range, Parcel 137 Q-X, April 2008.

36. Remedial Investigation Report, Draft, Baby Bains Gap Road Ranges, Range 18, Parcel 74Q; Range 20, Parcel 76Q-X; Range 23, Parcel 79Q; Range 26, Parcel 84Q-X; Range 25, Parcel 83Q and 118Q-X; Range 25 East, Parcel 223Q; Range 28, Parcel 86Q; and Area of Further Investigation for Ranges South of Range 25, Parcels 224Q and 226Q, August 2004.

37. Tetra Tech EC, Corporate Reference Library Procedure EHS 4-6, Temperature Extremes, October 2007.

38. Tetra Tech EC, Corporate Reference Library Procedure EHS 7-4, UXO Safety Concepts, November 1998.

39. Tetra Tech EC, Corporate Reference Library Procedure EHS 7-5, UXO Demolition Safety Precautions, November 1998.

40. Tetra Tech EC, Corporate Reference Library Procedure PO-8, Document Control, August 2007.
41. Tetra Tech EC, Corporate Reference Library Procedure ENG-3, Developing and Issuing Engineering Documents, January 2005.
42. Tetra Tech EC, Corporate Reference Library Procedure QPM-1, Quality Program Manual, March 2004
43. Tetra Tech EC, Corporate Reference Library Procedure QP-3, Qualification/Certification Quality Program Audit Personnel, June 2007.
44. Tetra Tech EC, Corporate Reference Library Procedure QP-9, DOD Contractor Quality Control, April 2002.
45. Tetra Tech EC, Corporate Reference Library Procedure QP-10, Control of Measuring and Testing Equipment, April 2002.
46. Tetra Tech EC, Corporate Reference Library Procedure QP-11, Control of Nonconforming Conditions, April 2002.
47. Tetra Tech EC, Corporate Reference Library Procedure QP-12, Corrective Action, April 2002.
48. Tetra Tech EC, Corporate Reference Library Procedure QP-14, Lessons Learned Procedure, January 2001
49. Tetra Tech EC, Standard Operating Procedure (SOP1), MEC Disposal, November 2008.
50. Tetra Tech EC, Standard Operating Procedure (SOP2), Purchase Receipt Accountability of Explosives, November 2008.
51. Tetra Tech EC, Standard Operating Procedure (SOP3), Storage of Explosives, November 2008.
52. Tetra Tech EC, Standard Operating Procedure (SOP4), Transport of Explosives, November 2008.
53. Tetra Tech EC, Standard Operating Procedure (SOP5), Management and Disposition for MPPEH, November 2008.

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APPENDIX A
TASK ORDER STATEMENT OF OBJECTIVES

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PERFORMANCE WORK STATEMENT (PWS)
Charlie Area Remedial Action
Fort McClellan, AL
June 26, 2008

1.0 OBJECTIVE. The objective of this project is to provide all Munitions Response (MR) services necessary to accomplish Remedial Action at the selected sites of the Charlie Area in Fort McClellan, AL in accordance with (IAW) requirements of the PWS and for the awarded price. The selected sites are as follows:

a. 81mm Mortar Range – 5.7 acres – Clearance to Depth of Detection
b. Range 20 – 25.5 acres - Clearance to Depth of Detection
c. Range 24A – 66.3 acres Total – Surface Only (12.55 Acres) and Clearance to Depth of Detection (Remaining 53.75 Acres)
d. Bains Gap Road Ranges – 36.7 acres – Clearance to Depth of Detection

2.0 BACKGROUND. Fort McClellan is a U.S. Army facility under control of the Base Realignment and Closure (BRAC) Division, Assistant Chief of Staff for Installation Management, Headquarters, and Department of the Army and was closed under the BRAC program. Material Potentially Presenting an Explosive Hazard (MPPEH), are known to exist on parts of this property.

2..1 GENERAL. The work required under this PWS falls under the Base Realignment and Closure (BRAC) program.

2.1.1.1 Material Potentially Presenting an Explosive Hazard (MPPEH) is a safety hazard and, if present, constitutes a hazard to the public and the environment. The Contractor will perform this work in a manner consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). For any actions on site, administrative requirements of Federal, State, or local permits are not required, but the substantive permit requirements shall be fulfilled. The provisions of 29 CFR 1910.120 apply to all actions taken at this site.

2.1.1.2 The Contractor has been provided data during the proposal process to include, but not limited to, answers to specific questions and any site data included in previous project documents. Specifically, the Contractor has been provided with a Draft-Final Charlie Area EE/CA report that documents conditions at the site as gathered and interpreted by a third party Contractor. The Government makes no claims as to the accuracy of the site data supplied and/or the actual working conditions to be encountered. The actual conditions that the Contractor experiences may differ from the conditions reported in the data. The Contractor shall be responsible for interpreting the data provided in context of the conditions under which the EE/CA was conducted and the data analysis and extrapolation limitations typical of site assessment efforts. The Contractor attests that they have made an independent inspection of the site, have gathered the information necessary to fully understand the conditions they will encounter during execution of this task order, and have used any data provided by the Government at the contractors own risk.

2.1.1.3 Chemical Warfare Materiel (CWM). This site is not suspected of containing CWM. However, during conventional MEC operations, if the contractor identifies or suspects CWM, the contractor shall immediately withdraw upwind from the work area and contact the contracting officer and the appropriate point of contact in their Work Plan (WP)/Accident Prevention Plan (APP). The contractor shall secure the area and provide two personnel located upwind of the suspect CWM to secure the site until relieved by the Department of the Army emergency response personnel. Additional support may be required by the emergency response personnel, e.g., construction of blast mitigation controls. Additional reporting instructions are contained in CEMP-CE Memorandum, Notification Procedures for Discovery of Recovered Chemical Warfare Materiel (RCWM) During United States Army Corps of Engineers (USACE) Projects:
http://www.hnd.usace.army.mil/oew/policy/IntGuidRegs/RCWM%20Notification%20memo_w_encl23%20April%2004.pdf

2.2 SITE LOCATION. Fort McClellan is located northeast of the City of Anniston, Calhoun County, Alabama. To the west is the area known as Blue Mountain. To the North are the areas known as the City of Weaver and Jacksonville. The Talladega Forest is to the east of the post.

2.3 SITE HISTORY. Fort McClellan has been used for artillery training of troops and the National Guard as early as 1898 to the present day. In 1941, McClellan became site of the Chemical Corps Training Command. In 1962, the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency moved to Fort McClellan. In 1973, the Chemical Corps School along with the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency closed. In 1979, the U.S. Army Chemical Corps School re-established along with a Training Brigade for Basic Training. Fort McClellan was closed in September 1999 under the BRAC program. The US Army Corps of Engineers contracted to complete site characterization activities and EE/CA Document production for the site in 2002. The US Fish and Wildlife Service (USFWS) review of the Draft Final EE/CA (December 2004) resulted in postponement of the final EE/CA. Concerns have been resolved, however the Final EE/CA is postponed pending agreement of supplemental sampling requirements requested by ADEM.

2.4 AREA OF CONCERN. The Charlie Area comprises unnamed parcels in the Choccolocco Mountains east of the Redevelopment Area and portions of the Choccolocco Corridor east of the mountains. The area inclusive of the Choccolocco Mountains was transferred to the Department of Interior for management by the Fish and Wildlife Service as a National Wildlife Refuge. The Alabama Forestry Commission manages the Choccolocco Corridor. There are four Remedial Action (RA) sectors within the Charlie Area totaling approximately 134.2 acres identified as potentially contaminated with OE. See Figures A – D attached to this PWS for description and location of these RA areas within the Charlie Area and the Choccolocco Mountains area. These four RA sectors fall within larger Munitions Response Sectors that will not be remediated at this time.

3.0 SPECIFIC TASKS. The Contractor will be evaluated periodically during each of the following tasks to ensure compliance with the PWS and to document that quality objectives, delivery schedule, and the overall completion date are being met. This evaluation will be performed according to a Quality Assurance Surveillance Plan (QASP). An example of a QASP is contained in EM 1110-1-4009 and will be modified for the specific task order requirements and the Contractor's Quality Control Plan (QCP). Failure to adequately complete any service or submittal to at least a satisfactory level of quality or timeliness may result in a repeat of the work, or a poor performance evaluation. Performance metrics are provided in Section 6.0. Minimum requirements for contractor QC and/or Government QA are provided in Section 7.0.

3.1 TASK 1, PROJECT PREPARATION AND PLANNING. This is a **FIRM FIXED PRICE** task.

The contractor is authorized a post award site visit. The contractor shall notify the Huntsville Engineering & Support Center Project Manager (PM) 14 days prior to a planned site visit. The contractor shall submit for approval an Abbreviated Accident Prevention Plan (AAPP) prior to the site visit. The contractor shall not visit the site until receipt of approval of the AAPP. The contractor shall provide a trip report to the PM 7 days after conclusion of the site visit.

3.2 TASK 2, WORK PLAN (WP). This is a **FIRM FIXED PRICE** task.

The contractor shall prepare and submit for acceptance a WP that is a detailed and comprehensive plan covering <u>all</u> aspects of the work effort in accordance with (IAW) data item description (DID) MR-005-01 and EM 1110-1-4009.

Specific Task Requirements: The WP shall describe the specific work proposed in order to meet the objectives and requirements of this PWS. The WP shall contain, at a minimum, those items listed under Paragraph 2 of DID MR-005-01. The WP shall also describe in specific terms the policies, organization, objectives, functional activities, Accident Prevention Plan, Data Quality Objectives (DQOs), Munitions and Explosives of Concern (MEC) Investigation, Data Management and specific Contractor Quality Control (QC) activities including requirements identified in paragraph 6.0 to achieve the objectives for this project. The WP shall contain, at a minimum, those items listed under Paragraph 2 of DID MR-005-01which are a Technical Management Plan (DID

MR-005-02), an Explosive Management Plan (DID MR-005-03), Explosives Siting Plan (DID MR-005-04), Accident Prevention Plan (APP), which includes a Site Safety and Health Plan (SSHP) (EM 385-1-1), Environmental Protection Plan (DID MR-005-12), and a Quality Control Plan (QCP). The QCP shall be a detailed and comprehensive plan covering **all** aspects of the response. Other sub plans or elements shall be required as necessary to support the Contractor's technical approach. A property management plan will be required if the Contractor has Government furnished equipment.

The WP shall include erosion control and site specific environmental protection plan(s) as required (if required) by the State to address impacts to the area of operations, adjacent properties and down-gradient water bodies. The Contractor shall propose and justify methods and procedures that are well suited to the anticipated site conditions. The contractor shall add a lead abatement plan per EM 385-1-1, which requires procedures to be followed to protect workers from lead hazards while performing work that may disturb lead contaminated materials. The Government reserves the right to review proposed methods to ensure compliance with the Performance Work Statement, regulations and references specified herein. The Contractor shall consider technical requirements for the site as well as safety, security, environmental regulations, engineering controls, and road closures applicable to this site. If review of the Draft version WP results in significant revisions to be required, the document will not be accepted by the Government and the follow-on submission will constitute the Draft submission. The Work Plan may be changed as necessary to meet the specified performance measures and as a result of the QC/QA process. Changes are to be in compliance with the PWS, Accident Prevention Plan, as well as all applicable Government regulations and standards. Changes are to be submitted for Government review, and work may proceed IAW the currently approved work plan while the pending Government review is underway. No changes to the currently approved work plan may take place in the field, until formally approved by the Government and subsequently accepted by the Contractor. The Contractor may request an onboard review in Huntsville, AL after receiving comments on the Draft Work Plan. The Contractor shall provide a CD of the Final Work Plan. This CD is in addition to the other CDs required elsewhere in the PWS. Hard copies of the final Work Plan shall be submitted 14 days after the conclusion of the onboard review.

3.3 TASK 3, GEOPHYSICAL FIELD WORK. This is a **FIRM FIXED PRICE** task.

3.3.1 The objective of this task is for the contractor to perform all necessary geophysical field activities to meet the overall objective of this task order.

3.3.2 Geophysical Proveout: This is a Firm Fixed Price task. The objective of this task is for the Contractor to perform a geophysical proveout that complies with the requirements of DID MR-005-05.01 and EM 1110-1-4009 Chapter 6-9 for digital and analog geophysical methods to be used on the site and submit the data for Government acceptance. The Contractor shall perform a geophysical prove-out at the location identified by the Government on Fort McClellan Fish and Wildlife Service (FWS) property following work plan approval. The Alabama Department of Environmental Management (ADEM) shall be notified in advance of the Geophyiscal Proveout, so that they may observe if they choose. The Contractor shall submit for approval a GPO letter report that complies with the requirements of DID MR-005-05.01, and shall submit 1 copy to the U.S. Army Transition Force at Fort McClellan, and 2 copies to ADEM. The GPO results shall be approved by ***USAESCH*** prior to proceeding with the geophysical investigation. For costing purposes, the Contractor shall assume the geophysical test plot is adequate for the needs of this project.

3.3.3 Geophysical Investigation and Evaluation: This is a Firm Fixed Price task. The objective of this task is for the Contractor to perform a geophysical investigation that complies with the requirements of DID MR-005-05.01 and EM 1110-1-4009 Chapter 6-9 and submit the data for Government acceptance. All areas under 40% slope shall have a full coverage digital geophysical investigation. Areas with slopes greater than 40% shall be surveyed using EM/flag and/or dig or Mag/flag and/or dig methods of investigation. During the Geophysical Investigation, Geophysical field data, excavation results and QC data shall be provided to the USAESCH Contracting Officer, Project Manager and Geophysicist on a lot basis for QA review. The lot size of the deliverables will be recommended by the contractor for USAESCH concurrence. Geophysical QC shall follow the requirements in DID MR-005-05.01 and Section 7.0 of this PWS. The Contractor shall not demobilize until notified by the Contracting Officer that all investigation has been completed.

3.3.4 Analog geophysical methods: This is a Firm Fixed Unit Price task. The Contractor shall provide a unit cost per acre for additional analog geophysical survey and excavation methods as identified in section 3.2.3.

3.3.5 Digital geophysical methods: This is a Firm Fixed Unit Price task. The Contractor shall provide a unit cost per acre for additional digital geophysical survey and excavation methods as identified in section 3.2.3.

3.4 TASK 4, REMOVAL ACTIONS - SURFACE AND SUBSURFACE CLEARANCES. This is a **FIRM FIXED PRICE** task.

Objective: Remove MEC and MPPEH (to include munitions debris and range related debris) from the areas as specified in paragraph 1.0 of this PWS. Work shall be performed IAW this PWS, the approved WP, and all applicable standards. The Contractor shall stake the cleared area and provide a map of the cleared area in accordance with EC 1110-1-73 – Standards and Specification for Surveys, Maps, and Engineering Drawings, and the ALTA/ACSM Standards for Land Title Surveys.

3.4.1 MEC Disposal: The Contractor shall be responsible for the destruction of all MEC encountered during project activities.

3.4.2 Backfilling Excavations: All access/excavation/detonation holes shall be backfilled by the Contractor. The Contractor shall restore such areas to their prior condition.

3.4.3 MEC Accountability: The Contractor shall maintain a detailed accounting of all MEC items/components encountered. This accounting shall include the amounts of MEC, nomenclature and condition, location and depth of MEC, and disposition. The accounting system shall also account for all demolition materials utilized to detonate MEC on site. The contractor shall take digital photographs of identifiable MEC found during the removal.

3.4.4 Disposal/Disposition of Material Potentially Presenting an Explosive Hazard: All MPPEH/munitions debris shall be handled in accordance with Chapter 14, EM 1110-1-4009 dated 15 June 2007. In the event that a USACE OE Safety Specialist is not on site to sign as the verifier, the contractor's UXOQCS or UXOSO shall verify the munitions debris in accordance with EM 1110-1-4009.

3.5 TASK 5, GEOSPATIAL DATA. This is a **FIRM FIXED PRICE** task.

The objectives of this task are for the Contractor to up-date and maintain the existing GIS database, provided by the Government. The GIS will be used to build upon and manage IAW DID MR-005-07. A pre and post-project response action geospatial data analysis shall be performed using a GIS. All available existing data that is applicable to the project shall be consolidated into a database and analyzed to relay pertinent information to the PDT which may include GIS layers relating to cultural, environmental, biological, socioeconomic, and/or infrastructure variables. The database shall be a living repository that is refined throughout the life of the project. The analysis shall assimilate data into information. The Contractor shall submit the GIS data in a format compatible to the Environmental Systems Research Institute, Inc. (ESRI) (ArcView/ArcInfo) system, version 9.x (Shapefiles). The contractor shall incorporate layers that overlay on maps of the site that identify physical, cultural, biological and ordnance related items found during the investigation. Examples include: streets, highways, flora, fauna, and other sensitive habitats, MEC positively identified, positively identified archeological sites, environmental samples, and community structures. The contractor shall provide all submittals in the Alabama State Plane East FIPS 0101, NAD83 Projection coordinate system. Archeological site location(s) will not be released to the public without written permission from Fort McClellan Transition Force. The contractor shall submit GIS files to USAESCH with the Draft WP, the Draft Report and at the end of the project. The submission shall be by CD/DVD. The CD/DVD(s) shall be marked to convey the name of the project, the appropriate submittal name, date of submittal, and Contractor. The Contractor shall coordinate with USAESCH for this submission.

3.6 TASK 6, SITE SPECIFIC FINAL REPORT. This is a **FIRM FIXED PRICE** task.

The objective of this effort is for the Contractor to submit for acceptance a Site Specific Final Report (SSFR) IAW DID MR-030. This report will include identification of UXO and DMM where it was found, photographs and other pertinent information. It will also include the processing of all MPPEH and the disposition of all MD and range related debris sent to the recycler in accordance with Ch 14 of EM-1110-1-4009. In addition to conclusions required in paragraph 1.8 of DID MR-030, the Contractor is required to make recommendations as to any follow-on response action needed and should be a logical outcome of the conclusions. This task shall be performed in accordance with Consent Order No. 05-127-CHW (attachment), and shall include associated "sealed" surveys for clearance as mentioned in paragraph 3.4.

3.6.1 TASK 6A, MEETINGS. This is a **FIRM FIXED PRICE** task.
The contractor shall plan to attend five (5) meetings at Fort McClellan.

3.6.2 TASK 6B, (OPTIONAL) ADDITIONAL MEETINGS. This is a **FIRM FIXED PRICE** task.
This task is for the contractor to attend additional meetings outside of the five (5) mentioned as Task 6A.

4.0 SUBMITTALS AND CORRESPONDENCE

4.1 COMPUTER FILES

All final text files generated by the Contractor under this task order shall be furnished to the Contract Officer in MS Office Suite 2003 compatible format. All CADD drawings shall be in MicroStation V8 or higher. All geophysical and excavation data shall be submitted according to formats identified in DID MR-005-05.01. These documents shall be submitted on CD or DVD.

4.2 PDF DELIVERABLES

In addition to the paper and digital copies of submittals, all versions of any and all reports and/or plans shall be submitted in their entirety (including appendices), uncompressed, on CD or DVD in Adobe Portable Document Format (PDF) format along with a linked table of contents, linked tables, linked photographs, linked graphs and linked figures, all of which shall be suitable for viewing on the Internet. In the case of large reports, the appendices can be provided as one .pdf file separate from the narrative .pdf file. PDF files shall be produced from source documents wherever possible. PDF files shall be provided without security restrictions.

4.3 IDENTIFICATION OF RESPONSIBLE PERSONNEL

Each submittal shall identify the specific members and title of the Contractor's and subcontractor staff that had significant input into the report's preparation or review. All submittals shall be sealed by a registered Professional-In-Charge.

4.4 PUBLIC AFFAIRS

The Contractor shall not publicly disclose any data generated or reviewed under this contract. The Contractor shall refer all requests for information concerning site conditions to the Corps of Engineers Public Affairs Office (Mobile District) with a copy furnished to the USAESCH Project Manager. Reports and data generated under this contract are the property of the DoD and distribution to any other source by the Contractor, unless authorized by the Contracting Officer, is prohibited.

4.5 SUBMITTALS

The Contractor shall furnish copies of the plans, maps, and reports as identified in the List of Deliverables below, or as specified in this PWS, to each addressee listed below in the quantities indicated in paragraph 4.6. The Contractor shall submit 1 copy on CD with each hard copy of all submittals (WPs, Reports, Plans, etc) in accordance with section 4.1 & 4.2.

List of Deliverables:
For purposes of the PWS all days are considered calendar days.

Draft Work Plan	28 days after NTP.
Final Work Plan	14 days after on board review
Draft GPO Plan	28 days after award
Final GPO Plan	7 days after receipt of comments
Draft GPO Letter Report	21 days after Final GPO Plan
Final GPO Letter Report	5 days after receipt of comments
DGM Dig List	Upon completion of DGM activities
GIS Data	Included with Site Specific Report
Draft Site Specific Final Report	28 days after completion of field activities (excluding construction support)
Draft-Final Site Specific Final Report	14 days after receipt of comments.
Final Site Specific Final Report	14 days after receipt of comments.
Meeting Minutes/Conference Calls	5 days after event

4.6 ADDRESSEES AND SUBMITTAL QUANTITIES

The Contractor shall furnish copies of the plans and reports as indicated to each addressee listed below in the quantities indicated. The following addresses shall be used in mailing submittals:

ADDRESSEE	**Draft and Draft-Final Submittals**	**Final Submittals**
Commander US Army Engineering and Support Center, Huntsville ATTN: CEHNC-OE-DC (Mr. Allyn Allison) 4820 University Square Huntsville, Alabama 35816-1822	6	6
Commander US Army Engineering and Support Center, Huntsville ATTN: CEHNC-CT-E ( ) 4820 University Square Huntsville, Alabama 35816-1822	1	1
Commander US Army Engineer Division, South Atlantic ATTN: CESAD-PM-H (Ms. S. Ernst) 77 Forsyth St., SW Atlanta, GA 30335-6801	NA	1
Alabama Department of Environmental Management ATTN: Mrs. Brandi Little Engineering Services Section Governmental Hazardous Waste, Land Division 1400 Coliseum Boulevard Montgomery, AL 36110-2059	1	1
U.S. Army Transition Force ATTN: Mrs. Lisa Holstein 291 Jimmy Parks Blvd. Fort McClellan, AL 36205-5000	2	4
Mountain Longleaf National Wildlife Refuge ATTN: Steve Miller	2	2

664 Powers Ave, Suite 200 Fort McClellan, AL 36205		
UXO Pro Inc. ATTN; Jim Pastorick 811 Duke St Alexandria VA 22314	1	1
McClellan Joint Powers Authority ATTN: Miki Mahan Schneider 180 Headquarters Drive, Building 61 Anniston, AL 36207	1	1
Matrix Environmental Services ATTN: Richard Satkin 283 Rucker St., Bldg 3165, Anniston, AL 36205	1	1
Daphne Field Office, USFWS ATTN: Pete Tuttle 1208-B Main Street Daphne, AL 36526	1	1

Note: Addresses may have to be verified by the Contractor.

4.7 REVIEW COMMENTS

Various reviewers will have the opportunity to review submittals made by the Contractor under this contract. The Contractor shall review all comments received through the Technical or Project Manager/Contracting Officer and evaluate their appropriateness based upon their merit and the requirements of the PWS. The Contractor shall issue to the Project Manager a formal, annotated response to each. The Contractor shall not non-concur with a comment without discussing with the PM and/or comment maker.

4.8 SCHEDULE: A final schedule shall be submitted a minimum of 30 days before commencing fieldwork in a format compatible with Primavera or Microsoft Project. A PDF version shall also be submitted. This is an electronic submittal only. The Contractor shall update the schedule in accordance with DID MR-085 Project Status Report.

4.9 TELEPHONE CONVERSATIONS/CORRESPONDENCE RECORDS: The Contractor shall keep a record of each phone conversation and written correspondence concerning this Task Order in accordance with DID MR-055. A copy of this record shall be attached to the Project Status Report.

4.10 PROJECT STATUS REPORTS: The Contractor shall prepare and submit Project Status Reports in accordance with DID MR-085 and include any other items required in the PWS.

4.11 PERIOD OF PERFORMANCE: The Completion Date for this Task Order is one year from the date of award.

4.12 MILESTONE PAYMENTS FOR FIRM FIXED PRICE TASKS: Milestones will be considered met or completed when the appropriate QC documentation has been submitted, QA completed and the submittal and/or product is accepted. Any payment vouchers submitted that do not coincide with the final accepted milestones or do not have the appropriate QC documentation will be rejected. All payments will be made utilizing an agreed upon Payment Milestone Schedule.

5.0 REFERENCES

5.1 The Contractor is required to use the latest edition of all references.

5.2 *DoD, DA, USACE, and USAESCH regulations applicable to Chemical Agent and CACM/3x Scrap.*

5.3 *Draft-Final Engineering Evaluation/Cost Analysis for the Charlie Area of Fort McClellan, Alabama, December 2004*

5.4 *Final General Site-Wide Work Plan, Ordnance and Explosives Response, Fort McClellan, Alabama, 14 September 2000*

5.5 *Remedial Investigation Report, Draft, Bains Gap Road Ranges: Range 24 Upper, Parcel 80Q; Range 21, Parcel 77Q; Range 22, Parcel 78; Former Mortar Range (Firing Line), Parcel 109Q; and Range 27, Parcel 85Q, May 2004.*

5.6 *Remedial Investigation Report, Draft, Ranges Near Training Area T-24A, Parcels 187(7), 88(6), 108(7)/82Q-X, 112Q, 113Q-X, 213Q, and 214Q, April 2005.*

5.7 *Remedial Investigation Report, Final Revision 1, Former 81mm Mortar Range, Parcel 137Q-X, April 2008.*

5.8 *Remedial Investigation Report, Draft, Baby Bains Gap Road Ranges, Range 18, Parcel 74Q; Range 20, Parcel 76Q-X; Range 23, Parcel 79Q; Range 26, Parcel 84Q-X; Range 25, Parcels 83Q and 118Q-X; Range 25 East, Parcel 223Q; Range 28, Parcel 86Q; and Area of Further Investigation for Ranges South of Range 25, Parcels 224Q and 226Q, August 2004.*

5.9 The DIDs are available on the USAESCH Web Page at http://www.hnd.usace.army.mil/oew/dids.asp

6.0 PERFORMANCE METRICS:

6.1 Performance Metrics for Performance Assessment Record (PAR)

	Exceptional	Very Good	Satisfactory	Marginal	Unsatisfactory
PAR Category: Quality of Product or Service					
Performance indicator: Document reviews					
Draft Plans and Reports, and documents [Plans, documents and reports are considered draft until accepted as final by the Government]	All contract-milestone documents approved as submitted	No substantive comments (i.e. limited to grammar, spelling, terminology) to any of the documents or subplans but a few exceptions were noted and corrected by change pages	One or more documents or subplans required revisions to be resubmitted for approval prior to proceeding. However, no document or subplan required more than one backcheck, all original comments were resolved satisfactorily.	One or more documents or subplans required revisions to be resubmitted for approval prior to proceeding. Two backchecks were required on one or more documents or subplans before original comments were resolved satisfactorily.	One or more documents or subplans did not comply with contract requirements, or one or more documents or subplans required more than two backchecks before original comments were resolved satisfactorily.

Performance indicator: Project Execution					
Process Compliance	Zero Corrective Action Requests (CAR)	1-5 CARs for non-critical violations to WP requirements (no impact to overall cost and schedule resulting from the non-compliance)	6 or more CARS for non-critical violations to WP requirements (no impact to overall cost and schedule resulting from the non-compliance)	>1 CAR where non-compliance with WP requirements adversely impacted overall cost or schedule	Repeated non-compliance with WP requirements resulted in cost overruns or repeated schedule extensions
Quality Control	Zero QA failures, 90% or more QC measures accepted, zero repetitive QC failures	Zero QA failures, 90% or more QC measures accepted, one or more repetitive QC failure occurred	Zero QA failures, less than 90% of QC measures accepted, or, One or more non-repetitive QA failures occurred	1-5 repetitive QA failures occurred	>5 repetitive QA failures occurred

PAR Category: Schedule					
Performance indicator: Timely completion of tasks					
Final Work Plans and Reports, project milestones, T.O. invoices	All document submittals and task order milestones and invoices complete and approved by T.O date, project closed out/final invoice approved ahead of schedule	Project closed out/final invoice approved ahead of schedule	Project closed out/final invoice approved on T.O. date	Project closed out/final invoice approved within 30 calendar days after T.O. date.	Project closed out/final invoice approved more than 30 calendar days after T.O. date.
Project status reports accurate			Yes		No
Performance indicator: Impacts to schedule					
Impacts caused by contractor or other causes identified, in writing to HNC CO/ PM, in a timely manner to apply acceptable corrective actions.			Yes		No

PAR Category: Cost Control					
Performance indicator: No unauthorized cost overruns					
Unauthorized cost overruns			No		Yes
Total Project Costs	Total contract invoices less than 98% of T.O. authorized amount	Total contract invoices greater than 98% but less than 99.99%of T.O. authorized amount	Total contract invoices between 99.99% and 100% of T.O. authorized amount	Total contract invoices greater than 100% but less than 105% of T.O. authorized amount	Total contract invoices greater than or equal to 105% of T.O. authorized amount
Performance indicator: Monthly cost report					
Monthly cost reports accurate			Yes		No
Performance indicator: Impacts to cost					
Impacts caused by contractor or other causes identified, in writing to HNC CO/PM, in a timely manner to apply acceptable corrective actions.			Yes		No
PAR Category: Business Relations					
Performance indicator: Met contractual obligations					
Corrective Actions taken were timely and effective (Refer to CARs issued to contractor)			Yes		No
Performance indicator: Professional and Ethical Conduct					
Meetings and correspondences with Public, project delivery team and other stakeholders	Zero letters of reprimand, grievances, or formal complaints AND one or more unsolicited letters of commendation		Zero letters of reprimand, grievances, or formal complaints	One letter of reprimand, grievance or formal complaint that was resolved through negotiation	More than one letter of reprimand, grievance or formal complaint that were resolved through negotiation OR removal of one or more project personnel as a result of a letter of reprimand, grievance or formal complaint.
Performance indicator: Customer has overall satisfaction with work performed					
Customer survey results for rating period	4.0-5.0	3.0-3.9	2.0-2.9	1.0-1.9	<1.0
Performance indicator: Personnel responsive and cooperative					
Key personnel responsive and	Always		Most Times		Almost Never

cooperative					
PAR Category: Management of Key Personnel and Resources					
Performance indicator: Personnel knowledgeable and effective in their areas of responsibility					
Personnel assigned to tasks	All personnel proposed by contractor were assigned to project, some personnel were substituted by higher qualified individuals.		All personnel proposed by contractor were assigned to project, some personnel were substituted by equally qualified individuals.	All personnel proposed by contractor were assigned to project, some personnel were substituted by equally qualified individuals, Letter of reprimand received for personnel conduct from HNC.	All personnel proposed by contractor were assigned to project, some personnel were substituted by lesser qualified individuals or HNC requested, in writing, removal of assigned personnel for poor performance.
Performance indicator: Personnel able to manage resources efficiently					
Instances when resource management had negative impact on project execution	0	1-2	3-4	5-6	>6

PAR Category: Safety					
Performance indicator: Accidents and Violations					
*No Class A Accidents, contractor at fault	No class A accidents IAW AR 385-40	No class A accidents IAW AR 385-40	<1 non-explosive related Class D, accidents, or <2 non-explosive Class C accidents IAW AR 385-40.	<2 non-explosive related Class C accidents, or 1 non-explosive Class B accident, IAW AR 385-40	Any Class A accident IAW AR-385-40, or Any explosive related accident.
*Major safety violations	0 accidents/injuries No safety violations	0 accidents/injuries No safety violations	0 accidents/injuries 1 non-explosive related safety violation.	2 non-explosive safety violations.	any violation of procedures for handling, storage, transportation, or use of explosives IAW the WP, and all Federal, State and local laws/ordinances.
*Minor safety violations	No safety violations	1 safety violation	2 safety violations.	3 safety violations	>3 safety violations

Classes of Accident

Class A, Fatality or permanent total disability (Government Civilian, Military Personnel, and/or Contractor), or >$1,000,000 property damage.

Class B, Permanent partial disability or impatient hospitalization of 3 or more persons (Government Civilian, Military Personnel, and/or Contractor), $200,000< $1,000,000 property damage.

Class C, Lost Workday (Contractor) or Lost Time (Government Civilians), $20,000< $200,000 property damage.

Class D, $2,000< $20,000 property damage.

*From Section C of Basic contract #W912DY-04-R-0003, Amendment 0001 (may be included but are not limited these)

The following guidelines are provided for issuing ratings that are subjective in nature, these ratings will be supported by the weight of evidence documented during the government's surveillance efforts:

Exceptional: Performance *meets* contractual requirements and *exceeds many* to the Government's benefit. The contractual performance of the element or sub-element being assessed was accomplished with *few minor problems* for which corrective actions taken by the contractor were *highly effective*.

Very Good: Performance *meets* contractual requirements and *exceeds some* to the Government's benefit. The contractual performance of the element or sub-element being assessed was accomplished with *some minor problems* for which corrective actions taken by the contractor were *effective*.

Satisfactory: Performance *meets* contractual requirements. The contractual performance of the element or sub-element contains *some minor problems* for which corrective actions taken by the contractor *appear or were satisfactory*.

Marginal: Performance *does not meet all* contractual requirements. The contractual performance of the element or sub-element being assessed reflects a *serious problem* for which the contractor has *not yet identified corrective actions*. The contractor's proposed actions appear only *marginally effective or were not fully implemented*.

Unsatisfactory: Performance *does not meet most* contractual requirements and *recovery is not likely* in a timely manner. The contractual performance of the element or sub-element contains *serious problems* for which the contractor's corrective actions *appear or were ineffective.*

7.0 Performance Requirements and Minimum QC Requirements for RA

The Contractor shall include in their QC plan specific tests that are itemized below. The values listed in the various requirements below may be adjusted upon request, provided the Contractor supplies supporting documentation and rationales for government concurrence. All reported QC results from these tests will be reviewed as part of the QASP. In the event a requirement is not met and the contractor submits the data to the Government, the contractor shall provide rationales for accepting them. All such rationales will be reviewed as part of the QASP. If the rationales are either insufficient or technically unfeasible, or are attempts to justify non-conformances that should be corrected to meet project needs, the Government will issue a CAR to the contractor and the dataset(s) will be rejected. It is possible some of these requirements may change as a result of TPP decisions. These requirements are marked with an asterisk (*).

Performance Requirements for RA using DGM Methods [1]

Requirement	Applicability (Specific to Collection Method/Use)	Performance Standard	Frequency	Consequence of Failure[2]
Static Repeatability (instrument functionality)[3]	All	Response (mean static spike – mean static background) +-10% of GPO/original value on all channels	Min 1 daily	Day's data fails unless seed item is mapped that day with repeatable anomaly characteristics.
Along Line Measurement Spacing	All	98% <=25cm along line[4]	By dataset	Dataset submittal fails
Coverage(*)	Data using electronic positioning equipment	>95% coverage at project design line spacing.[5]	By dataset	Dataset submittal fails
	Data using fiducial positioning	All blind coverage seeds recovered[6]	Variable rate at 2, 3 or 4 per system per dataset.	Dataset submittal fails
Dynamic Detection Repeatability	All	Test item anomaly characteristics (peak response and size) repeatable w/in 75%.[7]	1 test item per grid	Grid submittal fails
Dynamic Positioning Repeatability	Data using electronic positioning equipment	Position offset of Test item target <=35cm + 1/2 line spacing.	1 test item per grid (same item as Dynamic Detection Repeatability)	Grid submittal fails
	Data using fiducial positioning	Position offset of Test item target <=50cm + 1/2 line spacing.	1 test item per grid (same item as Dynamic Detection Repeatability)	Grid submittal fails
Target Selection	All	All dig list targets are selected according to project design (zero unselected and not over-selecting)	By dataset	Dataset submittal fails
Anomaly Resolution(*)[8]	Verification checking by DGM re-mapping[9] Or Verification checking of excavated locations with original instrument[10]	90% confidence <1% unresolved anomalies[11] Accept on zero.	Rate varies depending on lot size. [Table showing rates per lot size for varying confidence levels will be provided][12]	Lot submittal fails

Geodetic Equipment Functionality(*)	All	Position offset of known/temporary control point is within 5cm, 30cm, (appropriate to the instrument being used).	Daily	Day's positioning data fails
Geodetic Internal Consistency	Grids with line/fiducial positioning	Grid corners are internally consistent within 30cm on any leg or diagonal.	Per Grid	Redo affected work (corner placement & data collection, or data processing)
Geodetic Accuracy	Grid corner/control points placed by non-PLS methods	Grid corners points must be verified by PLS within 30cm	1 per lot	PLS surveys all grid corners in lot.

Performance Requirements for RA using Analog Methods[13]

Requirement	Limited Applicability	Performance Standard	Frequency	Consequence of Failure[14]
	(Specific to Collection Method/Use)			
Repeatability (instrument functionality)	All	All items in test strip detected (trains ear daily to items of interest)[15]	Min 1 daily	Remedial training and removal from mapping for 1 day.
Coverage(*)	All Grids	All blind coverage seeds and blind detection seeds recovered[16]	Variable rate at 2, 3 or 4 times # operators, per lot.	Redo lot.
Detection & Recovery (*)	Grids with No DGM QC remapping	All blind detection seeds recovered	Per operator per lot: variable 1-2 large/deep and 1-3 small/ shallow[17]	Redo lot
	Grids With DGM QC remapping	90% confidence <1% unresolved anomalies. Accept on zero.[18]	Rate varies depending on lot size. [Table showing rates per lot size for varying confidence levels will be provided][19]	Redo lot

Anomaly Resolution(*)[20]	Verification checking of excavated locations (analog or digital instrument)	2nd party checks open holes to determine: 90% confidence <1% unresolved anomalies. Accept on zero	Rate varies depending on lot size. [Table showing rates per lot size for varying confidence levels will be provided][21]	Redo lot
	Verification checking by DGM remapping[22]	Same as Detection & Recovery	Rate varies depending on lot size. [Table showing rates per lot size for varying confidence levels will be provided]	Redo lot
Geodetic Equipment Functionality(*)	All	Position offset of known/temporary control point is within 5cm, 30cm, (appropriate to the instrument being used).	Daily	Day's positioning data fails
Geodetic Repeatability(*)	Grid corners/control points	Measured locations are reoccupied within 30cm.	1 per lot	Lot submittal fails

[1] *These are the critical performance and minimum QC requirements for RI DGM methods. Contractors shall use additional methods/frequencies that they deem beneficial and as required in their SOPs.*
[2] *All QC failures also require a Root Cause Analysis.*
[3] *Item should be placed on a jig in the plane of the coil/sensor to ensure repeatability, response not to exceed 500 units, or optionally use the Geonics calibration coil, duration of data collection needed TBD by the contractor. Must compare to original to ensure instrument is consistent throughout the project. .It is recognized that this QC requirement may be redundant and could contradict results from seeding QC, however, in the event of seed failure, information from this test may aid in determining cause of failure, i.e. instrument or processing.*
[4] *25cm based on institutional knowledge and common instrument physical dimensions. Assumes speed used achieves detection. This requirement can be relaxed if supporting documentation is provided to the Government for concurrence.*
[5] *Recommended default line spacing is 0.6m for items of interest the size of 40mm grenades and smaller, else 0.8m.*
[6] *Coverage seeds are small pieces of metal that will produce relatively large amplitude anomalies over small areas, such as small nails or ball bearings. They shall be placed beneath the ground surface so as not to be visible to the operator.*
[7] *A standard test item shall be placed within the grid (i.e. a small pipe or flat plate with a small area response. Item can be placed flush with the surface or buried at a standard depth and standard orientation). This test does not demonstrate the detection capabilities of the MEC of interest. The standard response to this test item must be defined prior to the start of production field activities. Response repeatability to this standard test item in the mapping data will indicate data quality is consistent and sufficient for detection of the MEC items of interest.*

[8] *Resolved is defined as 1) there is no geophysical signal remaining at the flagged/selected location, or 2) a signal remains but it is too low or too small to be associated with UXO/DMM, or 3) a signal remains but is associated with surface material which when moved results in low, or no signal at the interpreted location, or 4) a signal remains and a complete rationale for its presence exists.*

[9] *Mapping shall cover the required number of anomaly locations. This is used in-lieu of checking individual anomalies for those instances where it is quicker to re-map sections of land rather than return to individual anomalies. Only the data at the anomaly locations is looked at, all other data is discarded.*

[10] *This requires leaving flags at excavated locations until QC is complete. It is up to the contractor to indicate which holes knowingly have metal left in them where the PDT has agreed such is acceptable. It is the contractor's responsibility to not put hot material back in the hole before QC is complete.*

[11] *This is a statistical test number. It does not imply there are 10% bad units. It tests there are fewer than 10% bad units, including zero bad units. Values for confidence levels will be determined by the PDT and are dependent on the information needed. Stopping rules will take precedence over this standard (i.e. for high MEC density, decision could be made to stop because the team has enough data for characterization)*

[12] *For example, if lot size is 500 anomalies, to achieve a 90% confidence that there are less than 5% unresolved anomalies, 44 anomalies must be re-checked. If any one of the 44 is unresolved, then the confidence level has not been met and the lot submittal fails (i.e. accept on zero).*

[13] *These are the critical QC requirements for RI analog methods. Contractors shall use additional methods/frequencies that they deem beneficial and as required in their SOPs.*

[14] *All QC failures also require a Root Cause Analysis.*

[15] *The requirement is that each operator demonstrates positive detection on a daily basis of the smallest and largest expected MEC of interest when it is placed at both its best and worst orientations and buried between 95% and 100% of their respective maximum consistent detection depth. Maximum consistent detection depth is defined as producing any above background response on a minimum of the first three time gates of the EM61MK2 optimized for site conditions and having a 0.9m^2 size or more as calculated using the Geosoft Oasis Montaj UCEAnalyseTarget.NET or equivalent routine.*

[16] *Coverage seeds are small pieces of metal that will produce relatively large amplitude anomalies over small areas, such as small nails or ball bearings. Known location accuracy of placement is not critical. See endnote #5 for description of blind detection seeds.*

[17] *Detection and recovery must be consistently demonstrated for the hard to detect items; therefore, the largest expected MEC and the smallest expected MEC shall be placed between 95% and 100% of their respective maximum consistent detection depth*

[18] *Unresolved anomaly for 'Detection & Recovery Testing' means a significant signal remains without a complete rationale for its presence. Default values for such a 'significant signal' are peak amplitude on sum channel >=30mv & anomaly width >=1.2m or anomaly size >=0.9m^2. This value may change but must be agreed upon by the PDT up front.*

[19] *The statistical calculations for this test are in progress. This is different from sampling of excavated holes, in that a portion of the acreage is re-mapped, and the amount re-mapped must be statistically valid to show, to some confidence level, that anomalies did not go undetected.*

[20] *This requires leaving flags at excavated locations until QC is complete. If shovel called to a flag during QC then the failure has already occurred—it is not important that something large or small comes out of the hole. Assumption here is "mapping coverage" is addressed through other means. It is up to the contractor to indicate which holes knowingly have metal left in them where the PDT has agreed such is acceptable. It is the contractor's responsibility to not put hot material back in the hole before QC is complete.*

[21] *For example, if lot size is 500 anomalies, to achieve a 90% confidence that there are less than 5% unresolved anomalies, 44 anomalies must be re-checked. If any one of the 44 is unresolved, then the confidence level has not been met and the lot submittal fails (i.e. accept on zero).*

[22] *Mapping shall cover the required number of anomaly locations. This is used in-lieu of checking individual anomalies for those instances where it is quicker to re-map sections of land rather than return to individual anomalies. Only the data at the anomaly locations is looked at, all other data is discarded.*

APPENDIX B
SITE MAP

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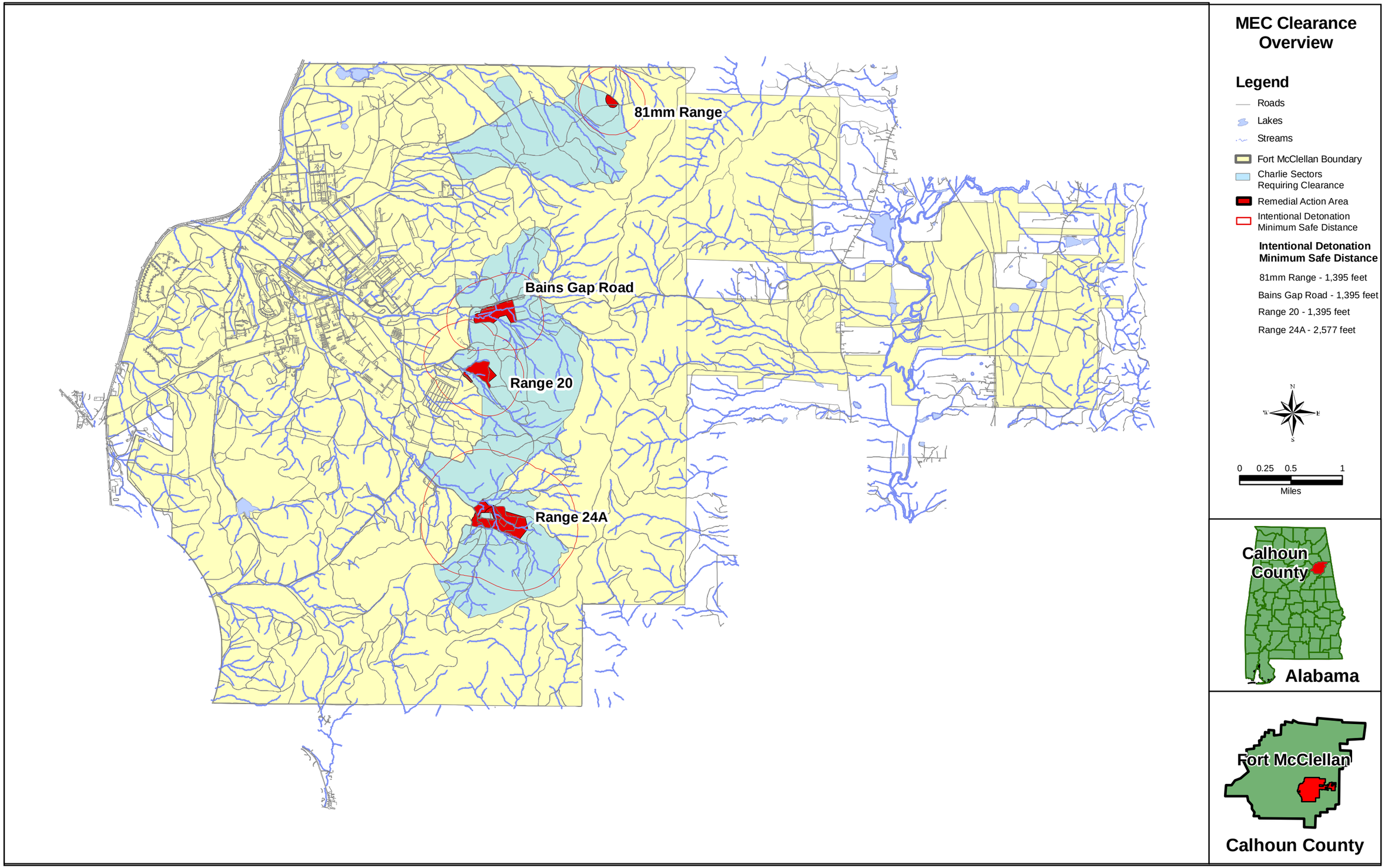

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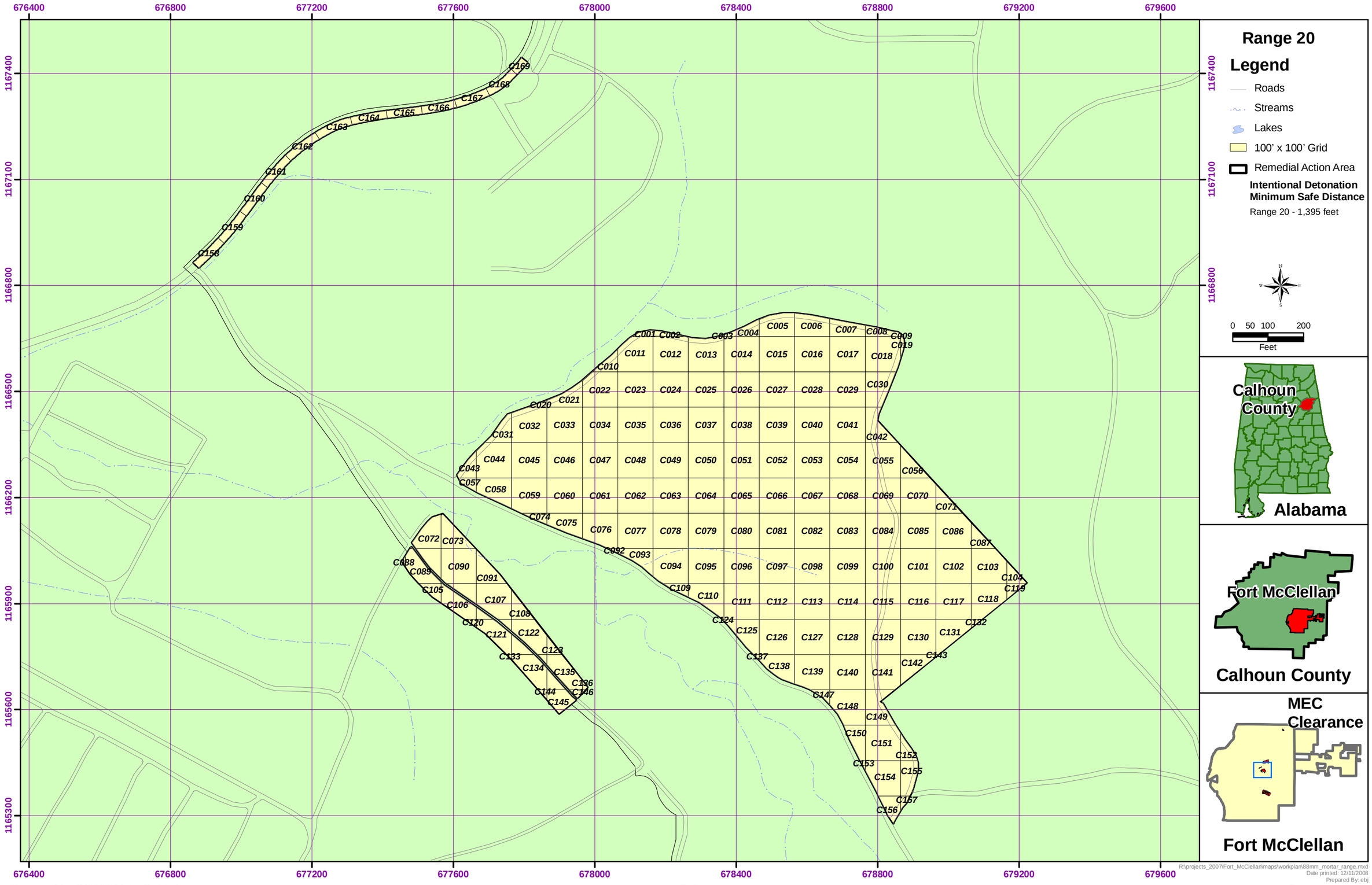
Prepared By: ebj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Legend
Roads
Streams
Lakes
100' x 100' Grid
Remedial Action Area
Intentional Detonation Minimum Safe Distance
Range 20 - 1,395 feet
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Feet
Calhoun County
Alabama
Fort McClellan
Calhoun County
MEC Clearance
Fort McClellan
676400
676800
677200
677600
678000
678400
678800
679200
679600
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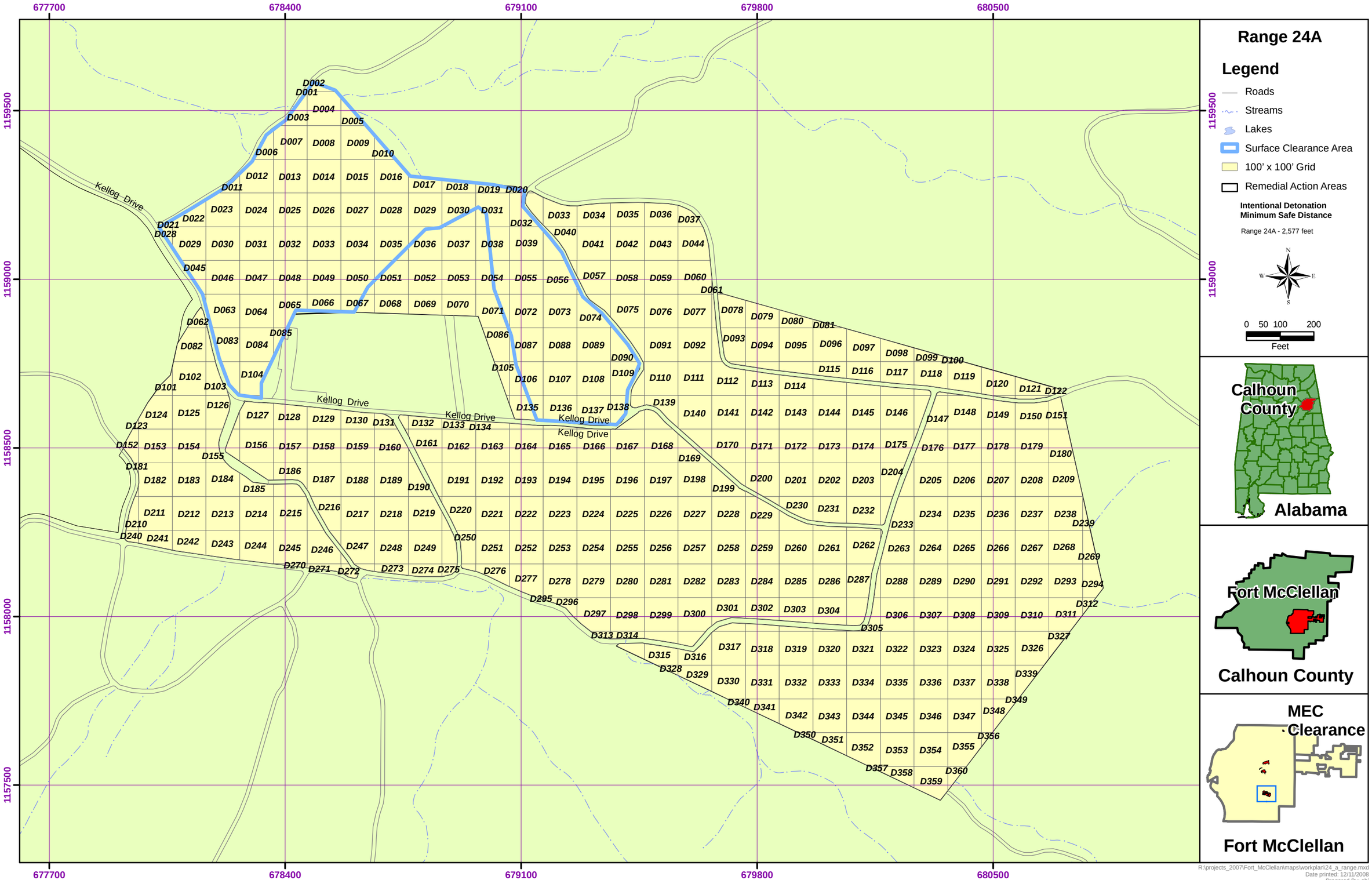
1165600
1165300


Range 24A
Legend
Roads
Streams
Lakes
Surface Clearance Area
100' x 100' Grid
Remedial Action Areas
Intentional Detonation Minimum Safe Distance
Range 24A - 2,577 feet
0 50 100 200
Feet
Calhoun County
Alabama
Fort McClellan
Calhoun County
MEC Clearance
Fort McClellan
Kellog Drive
677700
678400
679100
679800
680500
1159500
1159000
1158500
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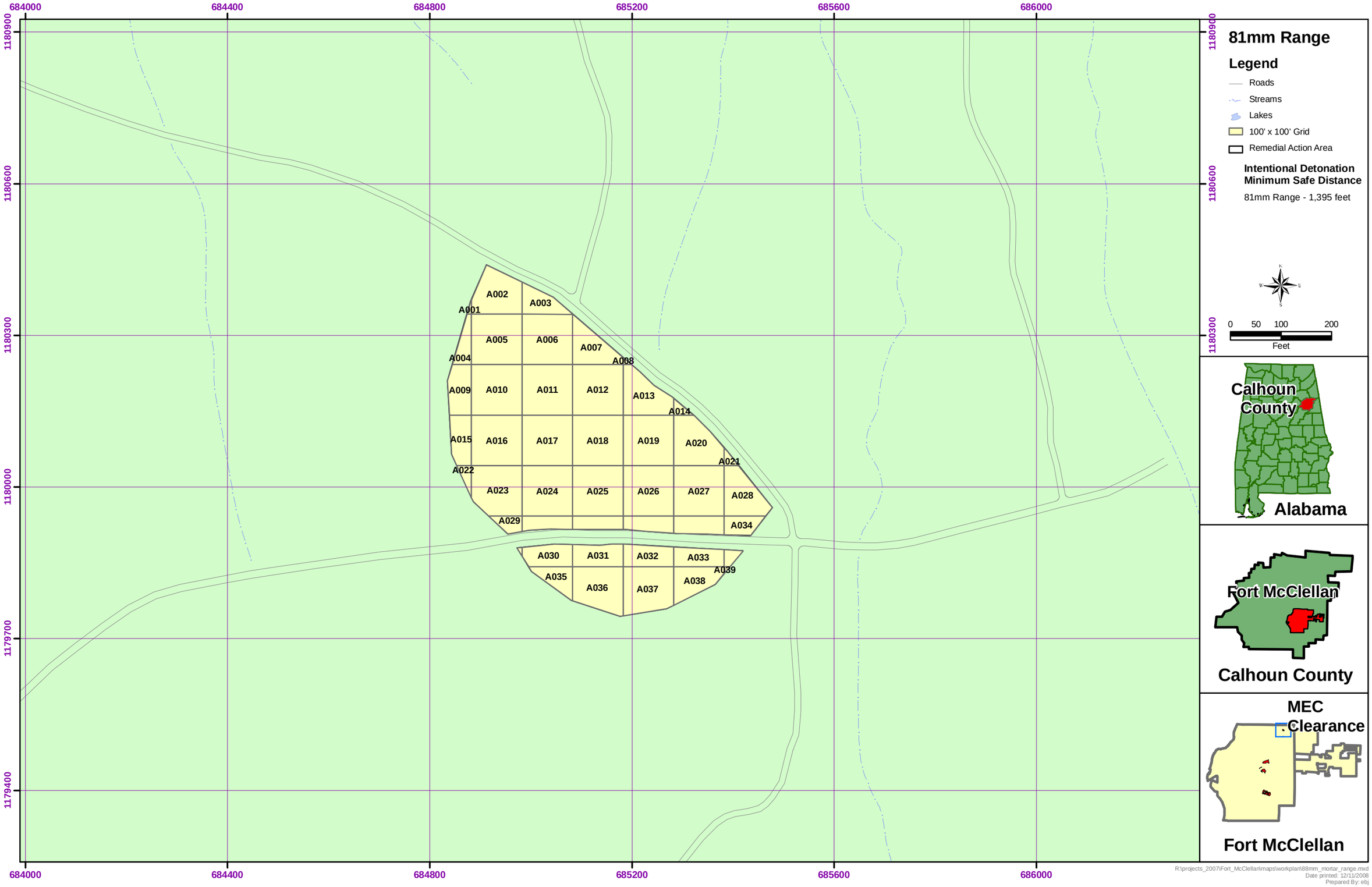
Prepared By: ebj


81mm Range
Legend
Roads
Streams
Lakes
100' x 100' Grid
Remedial Action Area
Intentional Detonation Minimum Safe Distance
81mm Range - 1,395 feet
0 50 100 200
Feet
Calhoun County
Alabama
Fort McClellan
Calhoun County
MEC Clearance
Fort McClellan
684000
684400
684800
685200
685600
686000
1180900
1180600
1180300
1180000
1179700
1179400
A001
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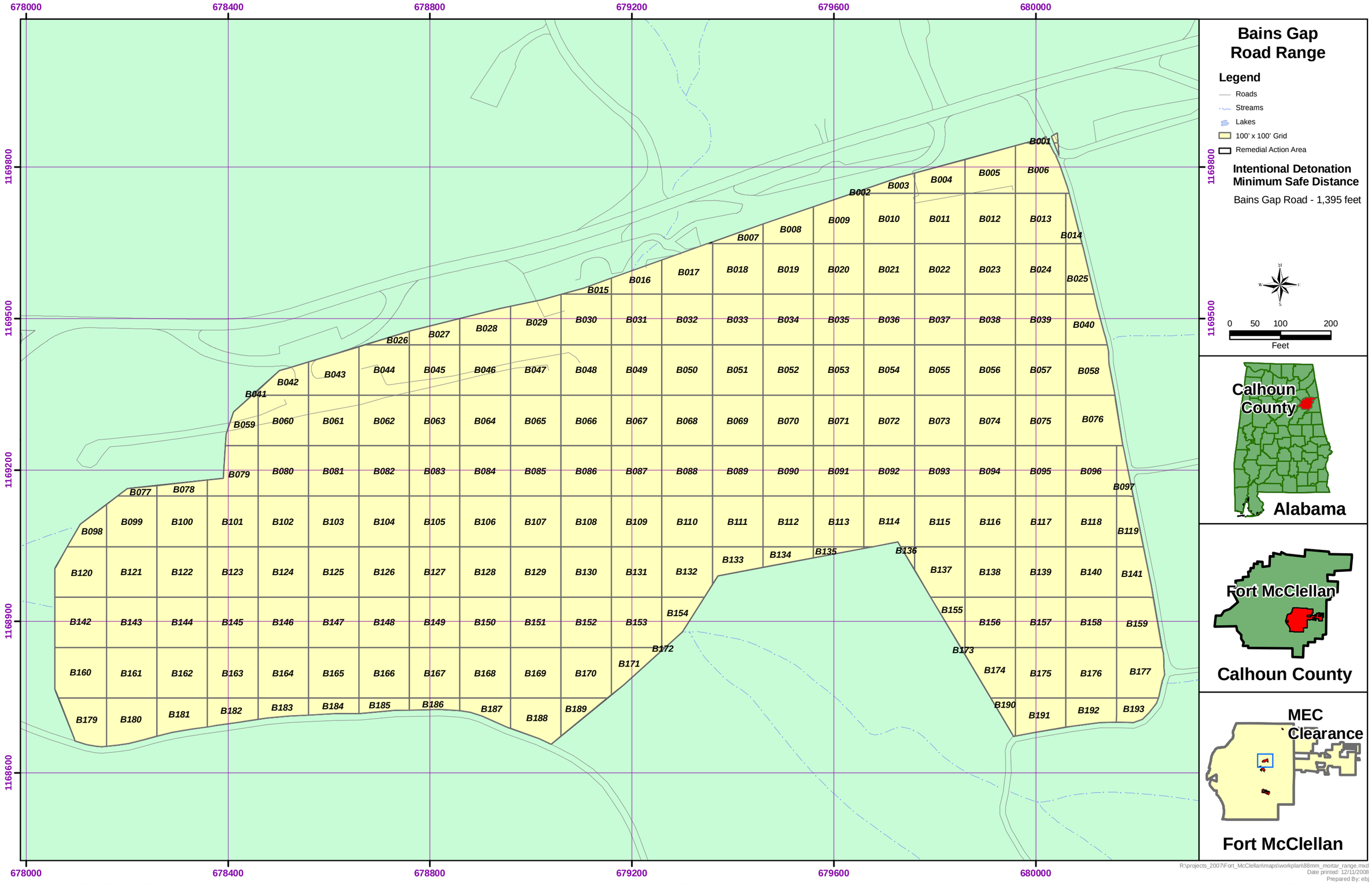
Prepared By: ebj



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Date printed: 12/11/2008
Prepared By: ebj

APPENDIX C
LOCAL POINTS OF CONTACT

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APPENDIX C
CONTACT LIST
CHARLIE AREA – FORT McClellan
W912DY-04-D-0011

NAME	FUNCTION	ADDRESS	PHONE
Emergency 911			
Anniston Fire Dept.	Fire Department	225 E 17th St, Anniston, Al 36207	(256) 231-7644
Anniston Police Dept.	Law Enforcement	1200 Gurnee Ave, Anniston, AL 36201-4567	(256) 238-1800
Calhoun County Sheriff's Office	Law Enforcement	400 West 8th Street, Anniston, AL 36201	(256) 236-6600
Regional Medical Center	Hospital	400 E 10th Street, Anniston, AL 36202	(256) 235-5121
Anniston EMS	Ambulance	1501 Noble St, Anniston, AL 36201	(256) 237-8572
Chemtrac		43300 State Highway 225 Bay Minette, AL 36507	(800) 424-9300
National Response Center		National Ctr, King City, MO 64463	(800) 424-8802
Fort McClellan Transition Force Operations		291 Jimmy Parks Boulevard Fort McClellan, AL 36205-5000	(256) 848-5680
Anniston Police Dept.	HAZMAT Response	225 E 17th St, Anniston, Al 36207	(256) 237-3541
U.S. Army Engineering and Support Center (USAECH)			
Wanda Hampton	Contracting Officer	Wanda.Hampton@usace.army.mil	256.895.1061
Richard Mullady	Contracting Official	Richard.j.mullady@usace.army.mil	256.895.1061
Tommy Hunt	Technical Manager	Tommy.j.hunt@usace.army.mil	256.895.1612
Allyn Allison	Project Manager	Allyn.t.allison@usace.army.mil	256.895.1121
Transition Force			
Lisa Holstein	Transition Force	Lisa.holstein@us.army.mil	256.848.7455
Scott Bolton	Transition Force	Scott.bolton@us.army.mil	256.848.6561
US Fish and Wildlife			
Steve Miller	USFAW	Stephen_a_miller@fws.gov	256.848.7085
ADEM			
Brandi Little	ADEM	blittle@adem.state.al.us	334.274.4226
TTEC			
Art Holcomb	Program Manager	Art.Holcomb@tteci.com	256.430.3701 (cell) 770.331.4195
Don Welch	Project Manager	Don.Welch@tteci.com	(cell) 256.454.4451
Steve Neill	PESM/ Quality Control Manager	Steve.Neill@tteci.com	804.642.0202 (cell) 770.330.7068
Bill Bendel	SUXOS	Grady.Bendel@tteci.com	256.820.7904 (cell) 850.258.6462
David Wells	SCE	David.Wells@tteci.com	256.430.3634
Joann Sheldon	Procurement	Joann.Sheldon@tteci.com	314.647.1586

APPENDIX D
ACCIDENT PREVENTION PLAN

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APPENDIX D

Final

ACCIDENT PREVENTION PLAN

Remedial Action in Charlie Area for Four Lead Removal Sites at Fort McClellan, Alabama

Prepared For:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

Unrestricted Comprehensive Environmental Contract
Contract Number: W912DY-04-D-0011
Delivery Order 0010

Prepared By:
Tetra Tech EC, Inc.
4960 Corporate Drive, Suite 140
Huntsville, Alabama 35805

December 2008

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This Accident Prevention Plan (APP) has been prepared in accordance with DID MR-005-06 to address the hazards associated with work activities at Fort McClellan. By their signatures, the undersigned certify that this APP will be utilized for the protection of the health and safety of employees during work activities at Fort McClellan.

Plan Approved By:	**Telephone No.**	**Date**
Donald Welch	256-454-4451	11/13/08
Donald Welch Project Manager		
S W Neill	770-330-7068	11/09/08
Stephen Neill Project Environmental and Safety Manager		

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1.0 INTRODUCTION AND BACKGROUND

Tetra Tech EC, Inc. (TtEC) has developed this Accident Prevention Plan (APP) to establish personnel protection standards and mandatory safety practices and procedures for work being performed by TtEC UXO personnel and subcontractors at Fort McClellan in Anniston, Alabama. This APP was prepared for the United States (U.S.) Army Engineering and Support Center, Huntsville (USAESCH) in accordance with Data Item Description (DID) MR-005-06. The Site-Specific Safety and Health Plan (SSHP), Attachment 2, assigns responsibilities, establishes standard operating procedures, and sets forth contingencies that may arise while operations are being performed.

1.0.1 The SSHP establishes policies and procedures to protect workers and the public (if applicable) from the potential hazards posed by site work. The elements of this plan comply with the informational requirements of Occupational Safety and Health Administration (OSHA) (29 Code of Federal Regulation (CFR) 1910.120. [b][1] and 29 CFR 1926.65[b][4][ii]), USACE (Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste, Ordnance and Explosive Waste (OEW) Activities, ER 385-1-92 and Section 28B in the USACE Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1), and TtEC's Environmental, Health, and Safety programs.

1.1 CONTRACT DATA

Project Name: Charlie Area, Fort McClellan

Contractor: Tetra Tech EC, Inc.

Contract Number: W912BV-04-D-0011 (Delivery Order 0010)

1.2 SITE DESCRIPTION

Fort McClellan is located northeast of the City of Anniston, Calhoun County, Alabama. To the west of the Fort are the areas known as Weaver and Blue Mountain. To the north is the City of Jacksonville. The Talladega Forest is located east of the Fort. The portion of Fort McClellan to be addressed in this APP has been designated the Charlie Area, and lies in the eastern portion of the facility, east of the main cantonment area. The Charlie Area is comprised of portions of the Choccolocco Mountains and the Choccolocco Corridor to the east of the mountains. The Charlie Area with the exception of the Choccolocco Corridor has been transferred to the Department of the Interior for management by the Fish and Wildlife Service as a wildlife refuge, the Mountain Longleaf National Wildlife Refuge (MLNWR). Maps of the site location are provided in Appendix B of the Work Plan.

1.2.1 Site History

Fort McClellan has documented use as a military training area since 1912, when the Alabama National Guard used it for artillery training. However, the Choccolocco Mountains may have been used for artillery training by the units stationed at Camp Shipp in the Blue Mountain Area during the Spanish American War as early as 1898. The 29th Infantry Division used areas of Fort McClellan for training prior to being ordered to France during World War I (WWI). In 1917, Congress authorized the establishment of Camp McClellan and in 1929, the camp was officially designated as Fort McClellan. Prior to World War II (WWII), the 27th Infantry Division assembled at Fort McClellan for training. Many other units used the site for various training purposes during the war. Following WWII, in June 1947, the Fort was deactivated. It was reactivated in January 1950. The site was used for National Guard training to include basic training and was also selected as the site for the Army's Chemical Corps and Military Police Schools.

1.2.1.1 The history of Fort McClellan, as described in the Archives Search Report (ASR) Findings (USAESCH, 2001a) and Archives Search Report Conclusions and Recommendations (USAESCH, 2001b) includes training activities and demonstrations that used conventional weapons (i.e., mortars, anti-tank guns, and artillery pieces). Chemical warfare training occurred during several periods of time that included the use of such items as chemical agent identification sets (CAIS), smoke pots, flame field expedients (FFE), rifle and smoke grenades. In 1973, the Chemical Corps school along with the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency closed. In 1979, the U.S. Army Chemical Corps School re was re-established along with a Training Brigade for Basic Training and the Military Police School.

1.2.1.2 Fort McClellan was recommended for closure under the Base Realignment and Closure (BRAC) Program, and was closed in September 1999. The USAESCH contracted to complete site characterization activities and an Engineering Evaluation/Cost Analysis for areas within Fort McClellan including Charlie. The final EE/CA for the Charlie Area is pending a modification to incorporate supplemental sampling requirements.

1.2.1.3 The United States Fish and Wildlife Service (FWS), along with the Anniston-Calhoun County FMC Development Joint Powers Authority (JPA), established the Mountain Longleaf National Wildlife Refuge on a portion of Fort McClellan within the Charlie Area. The refuge was established on June 1, 2003. The old growth stands of mountain longleaf pine, located in the Charlie Area, are some of the few left in the United States. The mountain ecosystem that exists in the Charlie Area is essentially the only one in the United States. Rare and uncommon plant species, such as the white fringeless orchid, exist in areas of the forest with spring water seeps. Many of the former Charlie lands now included in the wildlife refuge are suspected to contain UXO.

1.2.2 Types of MEC

Based on the information available, it is anticipated that the following MEC items may be encountered:

- 81mm Mortar Range: 81mm mortars
- Range 20: trip flares, MKII grenades, rifle grenades, 37mm projectiles, 40mm projectiles, 75mm projectiles, 81mm mortars, and 105mm projectiles
- Bains Gap Road Ranges: trip flares, 37mm projectiles, 60mm mortars, 2.36in rockets, 75mm projectiles, and 81mm mortars
- Range 24A: trip flares, MKII grenades, 37mm projectiles, 75mm projectiles, and 155mm projectiles

1.3 SCOPE OF WORK

TtEC was contracted by the USAESCH under Contract Number W912BV-04-D-0011, Delivery Order 0010 to conduct a Removal Action at the Charlie Area in Fort MCClellan, Alabama. TtEC will perform a surface inspection, conduct a geophysical investigation, and perform subsurface investigation in order to clear the designated areas (81mm Mortar Range, Range 20, Range 24A, and the Bains Gap Road Ranges) of Munitions and Explosives of Concern (MEC). Additionally, TtEC will remove the shoot house on Bains Gap Road. Materials present at this location will be evaluated for MPPEH, and once certified inert will be segregated for disposal and/or recycling. The designated areas for MEC removal activities have known areas that contain lead contamination above the industrial site-specific screening level (SSSL) for lead (i.e., 880 mg/kg). The SSSL were developed for human health and ecological risk evaluations as part of the ongoing site investigations performed under the BRAC Environmental Restoration Program at Fort McClellan (IT, 2000).

1.4 ACCIDENT EXPERIENCE

In accordance with OSHA recordkeeping requirements, TtEC maintains a summary of recordable incident rates. The summary data includes a listing of total recordable incident rate; days away, restricted, and transferred incident rate (DART); DART severity rate; days away incident rate; days away severity rate; overall TtEC incident rates; and reference BLS incident rates for construction. These rates for the previous year are listed in Table 1-1. The TtEC experience modification rate for FY2009 is 0.90.

Table 1-1
Incident Experience Summaries

Calendar Year 2007 Reporting Rates	Total Recordable Incident Rate	Days Away, Restricted And Transferred Incident Rate (DART)	DART Severity Rate	Days Away Event Rate	Days Away Severity Rate	Total Event Reporting Rate	Hours To Event Ratio
Year to Date	1.59	0.32	1.53	0.11	0.33	2	1630.9
2007 TtEC	1.08	0.35	5.35	1.08	2.15	1.0	2696.0
2005 BLS Construction	6.3	3.4	NA	2.4	NA	NA	NA

1.5 ACTIVITY HAZARD ANALYSIS

The Activity Hazard Analysis (AHA) is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control, and mitigate those hazards. The AHAs follow the guidance of the TtEC Environmental, Health, and Safety Procedure (EHS) 3-5. AHA has been conducted for the following activities:

- Mobilization and Demobilization
- Boundary Surveys
- Brush Clearance
- MEC Surface Sweeps
- Geophysical Mapping
- Manual MEC Clearance
- Shoot House Demolition
- MEC Disposal

1.5.1 An AHA matrix showing all of these activities along with the hazard analysis and mitigation measures, as necessary, is included in Attachment 1 of this plan. This AHA matrix will be used to train work crews, subcontractors and other site visitors in proper safety procedures during preparatory meetings or prior to site visits.

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

TtEC's commitment to safety is clearly defined in the corporate statement of environmental safety and quality policy. This policy is published in our Corporate Reference Library (CRL) and is available to all employees.

ENVIRONMENTAL SAFETY AND QUALITY POLICY

The management of Tetra Tech EC, Inc. is committed to ensuring the health, safety, and well-being of our employees and the communities in which we work, to enhancing and protecting the environment, and to providing quality services to our clients. This commitment is fundamental to our Client Service Quality®, Do It Right®, and Shared Vision℠ operating philosophies.

We are committed to:

- Providing and maintaining a safe and healthful work-place;
- Complying with all applicable environmental, health, and safety laws and regulations;
- Conforming with company policies and procedures and the requirements of ISO 14001;
- Incorporating pollution prevention and loss prevention principles into our work process;
- Delivering products and services that meet the quality expectations of our clients;
- Utilizing well trained personnel who understand and have the knowledge to fulfill their • ESQ responsibilities;
- Establishing ESQ improvement objectives and targets each year;
- Monitoring and continually improving our environmental management system; and
- Recognizing outstanding employee and project ESQ performance.

To fulfill these commitments, each employee of Tetra Tech EC, Inc. and its subsidiaries has the responsibility to help create and work in a safe and environmentally protective manner, to strive for Zero Incident Performance, and to promote the continual improvement of our organization.

Donald Rogers

President

2.1 ZERO INCIDENT PERFORMANCE

Zero Incident Performance (ZIP) describes TtEC's approach and expectations for both safety and project execution. We will achieve this level of performance excellence through teamwork and partnering with our client and our Subcontractors, and through the participation of every person on this project.

2.1.0.1 We (TtEC and our client) believe that:

- All incidents are preventable through proper planning, tasking, and execution of plans as written.
- Any goal besides Zero Incident Performance is unacceptable and sends the message that incidents cannot be prevented. Incidents are defined as OSHA recordables, property damage cases, fires, explosions, spills or releases to the environment and safety-related work stoppages. In addition, an incident includes an event which could have resulted in one of these outcomes had the circumstances been different (“near miss”).
- Active participation by all personnel is required to achieve Zero Incident Performance. This includes TtEC, the client, and all Subcontractor personnel.
- Each person on this project is individually responsible and accountable for their safety performance.
- If any incident does occur, it must be reported and investigated to identify root causes, take corrective actions, and communicate the lessons learned.

2.1.0.2 All TtEC and Subcontractor personnel will sign a ZIP pledge poster affirming their belief in and commitment to ZIP. The TtEC EHS will continually evaluate planning and project execution to ensure that ZIP is embedded in the work process. In addition, awareness programs are utilized to assist in implementation of our ZIP initiative.

2.1.0.3 A Subcontractor, after award of a contract, shall be required to attend a pre-construction Health and Safety Orientation meeting. This meeting will involve the Subcontractor’s key personnel, and will cover such items as ZIP expectations and the Employee Participation Program (EPP).

3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

The responsibilities of the health and safety staff are described in the following paragraphs.

3.1 PROJECT MANAGER (PM)

The Project Manager (PM) for this project is Don Welch. With respect to the safety and health program for this project, it is the responsibility of the PM to:

- Ensure implementation of this APP and the Site Safety and Health Plan (SSHP) incorporated as Appendix 1 through coordination with the SUXOS and the PESM.
- Conduct quarterly inspections jointly with the PESM.
- Participate in all incident investigations.
- Ensure the SSHP has all the required approvals before any site work is conducted.
- Ensure that the PESM and UXOSO are informed of project scope changes that require modifications of the APP and/or SSHP.
- Assume overall project responsibility for health and safety.
- Ensure that adequate resources are provided to the field staff to carry out their responsibilities as outlined below.

3.2 PROJECT ENVIRONMENTAL AND SAFETY MANAGER (PESM)

The PESM for this project is Stephen Neill. It is the responsibility of the PESM to:

- Provide for the development and approval of the APP and SSHP.
- Serve as the primary contact to review health and safety matters that may arise.
- Approve revised or new safety protocols for field operations.
- Approve individuals who are assigned UXOSO responsibilities.
- Approve the UXOSO to fulfill other project roles.
- Coordinate revisions of this APP and the SSHP with field personnel.
- Coordinate upgrading or downgrading of personal protective equipment with the UXOSO.
- Assist in the investigation of all accidents.
- Conduct quarterly inspections for compliance with the APP and SSHP.

3.3 SENIOR UXO SUPERVISOR (SUXOS)

The Senior UXO Supervisor (SUXOS) for this project is Grady Bendel. With respect to the safety and health program for this project, it is the SUXOS's responsibility to:

- Ensure Site Personnel comply with the APP and SSHP.
- Direct surface inspection and sweeps.
- Coordinate with the UXOSO on matters regarding MEC.
- Halt or modify any work conditions or remove personnel from the task site if conditions are unsafe.
- Ensure all task site personnel understand and comply with all MEC safety requirements.
- Monitor team leader and team member's performance, including safety and quality control.
- Be responsible for overall direction of on-site intrusive activities.
- Be responsible for the day-to-day MEC-related work at the site.
- Be responsible for implementing and enforcing all work plans related to MEC operations.
- Conduct daily activities such as: supervising employees in UXO operations, overseeing the implementation of specified levels of personal protective equipment, identifying potential problem areas and making corrective action recommendations to the PM, implementing all corrective actions, and maintaining a daily log of work activities including noting any extraordinary occurrences.
- Conduct weekly safety inspections jointly with the UXOSO.
- Conduct incident investigations.
- Initiate corrective actions for observed safety violations.
- Conduct daily safety meetings.
- Act as the Primary Emergency Coordinator.

3.4 UXO SITE SAFETY AND HEALTH OFFICER (UXOSO)

The UXOSO is Richard Rogaliner. It is the responsibility of the UXOSO to:

- Work as a member of the project team to ensure implementation of this APP and SSHP.
- Ensure all health and safety activities identified in this APP and SSHP are conducted and/or implemented.

- Identify operational changes that require modifications to the health and safety procedures and the APP and SSHP, and ensure the procedure modifications are implemented and documented through changes to the APP and SSHP.
- Conduct daily informal inspections.
- Conduct and document weekly and monthly inspections when the PM is not on-site.
- Direct and coordinate health and safety monitoring activities.
- Ensure site personnel are trained in the proper use of Personal Protective Equipment (PPE).
- Ensure proper PPE is utilized by field teams.
- Assist in conducting daily safety briefings.
- Conduct and document inspection of equipment brought on site.
- Monitor compliance with this APP and the SSHP.
- Notify the PESM and the OE Safety Specialist of all accidents/incidents.
- Coordinate with the PM, PESM, and OE Safety Specialist on any incident investigation.
- Maintain Accident/Incident Report Forms.
- Determine upgrades or downgrades of PPE based on site conditions and/or real-time monitoring results.
- Ensure monitoring instruments are calibrated before use (if needed).
- Report to the PESM summaries of field operations and progress weekly.
- Maintain health and safety field log books.
- Act as the Alternate Emergency Coordinator.

3.4.1 Field Crew Personnel

Field crew personnel include all other persons entering the site for the purpose of assisting in the completion of the project. This includes, but is not limited to, geophysicists, client representatives, TtEC management personnel, subcontractors, regulatory personnel, and site workers. It is their responsibility to:

- Report any unsafe or potentially hazardous conditions to the UXOSO.
- Maintain knowledge of the information, instructions, and emergency response actions contained in this APP and SSHP.

- Comply with rules, regulations and procedures set forth in this APP and the SSHP and any revisions that are instituted.
- Initiate the Incident Report when involved in an incident/accident if able to do so.
- Prevent admittance to work sites by unauthorized personnel. If the unauthorized persons refuse to leave, the field crew personnel will cease operations and notify the SUXOS who will notify the local police department who will remove these individuals.
- Inspect all tools and equipment, including PPE, daily prior to use.
- Conduct daily operations check of electronic equipment and annotate in Team Log Book.
- Assists the UXOSO with implementation and compliance with the APP and SSHP.

3.5 SUBCONTRACTORS AND SUPPLIERS

Subcontractors and suppliers will include:

- Explosives vendor: will deliver donor explosives to the site
- Security Firm: will provide overnight security for explosives magazine
- Citizens Against Pollution: will provide UXO Technicians and UXO Sweep personnel to supplement TtEC employees on site
- Registered Land Surveyor: will survey and mark parcel boundaries
- Vegetation cutting contractor: will mow grassy areas and clear cut wooded areas

3.5.1 Individuals employed by subcontractors/vendors will receive a site-specific briefing regarding the MEC hazards present on the site, required safety activities and their individual roles and responsibilities for safety practices. While on site they will be under the direct supervision of the SUXOS or UXO team leader and escorted by at least a UXO Tech II.

4.0 TRAINING

Written certification of completion of the required training and medical surveillance will be provided to the TtEC PM and USAESCH prior to field mobilization. The PM has the responsibility of ensuring that personnel assigned to this project comply with these requirements.

4.1 GENERAL SITE WORKER TRAINING

All personnel performing MEC work will have completed at least 40 hours of hazardous waste operations training, as required by 29 CFR 1910.120/1926.65. They must have received a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Those personnel who completed the 40-hour training more than 12 months prior to the start of the project will have completed an 8-hour refresher course within the past 12 months.

4.2 SITE-SPECIFIC ORIENTATION TRAINING

All personnel working on site will receive site orientation training. Site-specific orientation training will be documented during the project site kickoff meeting and whenever new workers arrive on site. No site workers will be allowed to begin work on site until the site-specific training is completed. This training will address this APP and all health and safety requirements and procedures pertinent to site operations. As part of the site-specific orientation training, the following topics will also be covered:

- Project orientation.
- Potential site hazards (chemical, physical, and biological).
- Hazard communication for chemicals brought onto the site.
- Selection, use, and limitation, of personal protective equipment.
- Emergency procedures including routes to the hospital and WorkCare clinics
- Blood borne pathogen briefing.
- Content of the APP.

4.3 SAFETY MEETINGS

Site safety briefings will be conducted by the UXOSO prior to the start of work each day. All personnel performing activities on site that day will be present at these meetings. During these meetings, each worker will be encouraged to share their observations, thoughts, and experiences on safety- and health-related issues pertinent to the jobsite. This venue also allows site management to discuss important hazard communication topics with the workers, such as plan-of-the-day activities and associated hazards and controls; required use of personal protective

equipment; decontamination procedures; emergency procedures; safe work practices; and, APP changes, to name a few.

4.3.1 A Daily Site Briefing form will be used to document these meetings and will include a listing of topics discussed, other pertinent issues, and the names of all attendees. The information gathered in these session will be used to correct any unsafe conditions or work practices at the jobsite and to amend the SSHP, as appropriate.

4.4 EMERGENCY RESPONSE TRAINING

Personnel on this project have not been trained as hazardous material responders and incident commanders, and therefore will not respond to off-site releases of hazardous materials, structural or major fires, or other catastrophic incidents beyond their training and competency. Training during initial orientation will include:

- Employee alarm system.
- Evacuation procedures, routes, meeting places and accountability.

5.0 HEALTH AND SAFETY INSPECTIONS

TtEC will perform weekly safety inspections in accordance with TtEC Corporate Reference Library Procedure EHS 3-3 to assess site conditions and verify they are in compliance with all applicable laws, regulations and policies. The SUXOS or designee will perform the weekly inspection. If the project duration extends beyond three months, quarterly safety inspections will be performed by the PM and the PESM. In addition, a variety of vehicle and equipment inspections are required. These inspections are outlined below.

5.1 RECEIPT INSPECTION FOR HEAVY EQUIPMENT

All construction equipment will be subject to a receipt inspection by a TtEC person experienced in heavy equipment operations prior to acceptance at the project site. The inspections and tests will be in accordance with the manufacturer's recommendations. Most vendors provide a form for notation of any existing damage to the equipment to be filled out on receipt. The equipment should be inspected carefully to determine its condition, including any damage, missing or non-functional equipment. Pictures of any damage shall be taken and saved in the equipment file. The agreement should be used as a basis to determine that everything contracted for (e.g., the equipment, its condition, manuals, spares, documentation of inspections, and certifications) has been delivered. All discrepancies should be noted on the form. A pre-inspection of the equipment prior to transport to the project site will be conducted. Particular attention should be given to the following items:

- All safety equipment and its condition.
- Operator certification on the equipment, when provided.
- Posted operating and safety instructions are present.
- All pollution control devices and their condition.
- All safety locking mechanisms and back up alarms.
- Safe entry and egress, with steps, ladders, handholds, and platforms provided as required, including safe access to perform routine checks, maintenance, and refueling operations.
- Leaking fluids, such as hydraulic oil, engine oil, transmission fluid, and coolant.
- Deteriorated or cracked hydraulic and coolant hoses which could result in leaks or spills.
- Presence of the manufacturer operation and maintenance manual.

5.1.1 Equipment with deficient conditions relating to safety or protection of the environment will not be placed into service until the deficiencies have been corrected and documented.

5.2 DAILY HEAVY EQUIPMENT INSPECTIONS

All heavy equipment will be subject to a daily (when in use) inspection for safety and operability, including manufacturers recommend daily inspections. The SUXOS will be notified of any deficiency immediately. The daily equipment inspection will be conducted at the start of the shift and provided to the SUXOS.

5.3 VEHICLE INSPECTIONS

Site vehicles will be subjected to a daily inspection for safety and operability. The inspection will include all safety related items such as windshield wipers, seat belts, tires, steering and brakes.

5.4 COMMUNICATION EQUIPMENT

Cellular telephones and field radios will be tested each morning to ensure that batteries are properly charged and these units are functioning. At this remote site, it will be essential to verify that communication lines across the site and with emergency service providers is available at all times.

6.0 SAFETY AND HEALTH EXPECTATIONS, INCENTIVE PROGRAMS, AND COMPLIANCE

6.1 SAFETY PROGRAM GOALS

TtEC believes that all incidents are preventable through careful planning, tasking and error free execution of the work. Company management personnel also believe that everyone is accountable for working safely and for identifying and controlling workplace hazards. This is the foundation of the TtEC Zero Incident Performance® (ZIP) philosophy. TtEC has adopted ZIP as a central goal and promotes it vigorously in all operations, because to accept a goal of anything more than zero is to assume and accept that some of our coworkers will get hurt. This is an unacceptable concession.

6.1.1 In pursuing this goal, TtEC anticipates zero recordable injury cases for the current and all subsequent years, no property loss events > $500, no first aid cases, or serious environmental releases (> reportable quantity). In achieving this goal, TtEC further anticipates a steady drop in contract-to-date recordable injury rates, DART incident rates and DART severity rates to well below industry averages. TtEC also expects EMR rates to remain less than 1.0 with a gradual lowering of the rate over time.

6.2 SAFETY INCENTIVES

Safety incentive programs are developed for large projects or programs. The incentive programs are site and contract specific. An incentive program has not been developed for this short-term project; however, the PM has the option of nominating employees who perform exemplar work for a Star of the Month award. This award program recognizes achievements in all fields including safety. Employees selected for the award receive a certificate and cash award.

6.3 COMPLIANCE

Compliance with the safety and health requirements described in the APP, SSHP, project work plans, applicable worker safety regulations, and corporate policies and procedures is expected of all personnel working on this project. When lapses in compliance occur with a given individual or individuals, the UXOSO will attempt to resolve the issue by discussing the problem with the individual directly stating clearly the nature of the deficiency and the steps that need to be taken to correct it. These corrective actions will be written into the site logbook with completion dates specified as appropriate. The UXOSO will then monitor the worker's performance to ensure the problem has been corrected. If compliance problems continue, the PESM and the individual's supervisor will become involved as necessary to correct the performance deficiency. A graded disciplinary approach will be taken which may involve a letter of reprimand issued to the worker, suspension, loss of pay, or removal from the project.

6.3.1 If the noncompliance issue involves failure to correct an unsafe condition or implement a required health and safety control, the problem will immediately be brought to the attention of the UXOSO for resolution. All personnel working on site are expected to participate in this hazard notification process. Once the issue has been disclosed, an investigation will be conducted by the UXOSO to evaluate the deficiency and correct it. The findings and remedial actions will be noted on an Incident and Investigation Report form or Quality Incident Report form or both and submitted to project management and PESM for review. Immediate correction of the unsafe condition or control will be made if possible. Otherwise, the problem will be isolated, site personnel will be informed, and a correction schedule with completion dates assigned will be used to manage the correction.

6.4 MANAGEMENT ACCOUNTABILITY

TtEC executive management conducts quarterly program reviews with the Program Managers. The review includes a detailed discussion on safety and health performance the previous quarter, the quantity and types of incidents that occurred, and actions taken to improve safety performance. The executive team evaluates the nature of all incidents occurring on each project and provides direct feedback to the Program Manager for use in managing health and safety risks and improving safety and health performance. Methods and means for improving or rewarding safety and health performance are discussed as appropriate.

6.4.1 TtEC executive management holds project managers and supervisors accountable by having them participate in weekly Environmental Safety and Quality Review Board meetings, as applicable. During these sessions, management reviews select safety and health incidents occurring at the jobsite and offers insights on lessons learned and suggests better approaches for correcting any underlying deficiencies, as necessary.

6.4.2 Numerous mechanisms exist for involving project managers and supervisors in the administration of the site safety and health program. Project management directly participates in scheduled site inspections, reviews all accident/incident reports and investigations, reviews all quality incident reports, ensures action items from incident reports are completed, and approves all changes to the accident prevention plan and site safety and health plan.

Safety and health performance is a specific performance category in each TtEC associate's performance evaluation.

7.0 ACCIDENT REPORTING

When an incident occurs, the Supervisor responsible (in this case the SUXOS) for the work performs an initial reporting and investigation. The Supervisor is assisted, as necessary in the investigation, causal analysis, and action plan development by others familiar with the work or event, EHS or Quality professionals, or other subject matter experts. Reports are submitted to the PESM who will ensure they are entered on-line into TtEC's Corporate Incident Database. Notifications are sent through the database via email to responsible managers who review and approve the reports. Based on a causal analysis of the event, corrective actions are specified and implemented to prevent similar incidents from occurring in the future. Notifications of high loss potential incidents are submitted to the PESM who will forward them to executive management on TtEC's Environmental Safety and Quality Review Board. This Board meets weekly via conference call to review selected events with project teams to identify lessons learned and improvement opportunities. Some of these items are distributed corporate-wide in the form of "Flash Reports" or "ZIP Bulletins". Others may result in changes to company procedures that are maintained in the electronic CRL. This library is accessible to every office and major project site through our intranet, and updates are distributed on CD-ROM to more remote project locations.

7.0.1 USAESCH will be notified immediately via telephone of any serious mishaps that occur at the jobsite with a follow-up report being sent to their office within 24 hours of the event. A serious mishap is considered an injury involving death of a worker(s), three or more worker hospitalizations, property damage > $200,000, or a weight handling incident resulting in a fatality, in-patient hospitalization, overturned crane, collapsed boom, or $200,000 damage to crane or adjacent property. For all reportable injuries (i.e. fatality, 3 or more hospitalizations, etc.), appropriate Federal or State OSHA agencies will be notified within 8 hours of the incident.

7.0.2 All recordable injuries, near miss incidents, high loss potential incidents (HIPO), property damage incidents costing > $500, first aid cases, and environmental spills (> reportable quantity) will be noted on TtEC's Incident Database. This database summarizes the accident/incident history of projects or programs from the start of the contract on a year-to-date basis. Total man-hours worked by TtEC's craft and professional staff and their subcontractors are used to calculate OSHA recordable incident rates which are listed on the incident summary.

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8.0 MEDICAL SUPPORT

8.1 MEDICAL SURVEILLANCE AND FITNESS FOR DUTY

All TtEC site personnel potentially exposed to hazardous substances on this project will participate in the corporate Medical Surveillance Program. This program requires a complete pre-employment physical with associated laboratory tests and a drug screen. TtEC site personnel must have passed this examination and have a copy of their medical clearance on file at the site before they are allowed to participate in the field activities.

8.1.1 An annual or biennial physical examination (as determined by occupational health physician) is also required for all personnel participating in this project. Additional physical exams (exit exams) are made available to employees who terminate their employment with TtEC or who are reassigned to a job position which does not require participation in the program. All site personnel involved in the demolition of the shoot house will participate in medical monitoring (i.e., blood tests for lead before beginning demolition and after removal of the material is complete) for potential lead exposure.

8.1.2 The medical examinations are conducted by a board certified occupational medicine physician in accordance with 29 CFR 1910.120 (f) and WAC 296-62-3050. Physician services for TtEC are provided by Work Care, 300 South Harbor Boulevard, Suite 600, Anaheim, CA 92805, (Phone: 1-800-455-6155). Actual employee medical exams are conducted by Work Care-affiliated clinics.

8.2 ON-SITE MEDICAL SUPPORT

Regional Medical Center is located in Anniston, Alabama and can provide emergency services as is required. Additionally, all TtEC UXO personnel receive First Aid and CPR training on a regular basis and at least two members of the field staff must be current on that training. These individuals will provide initial first aid treatment, as required by the situation, for non-serious injuries. All UXO personnel at this project site (and others as appropriate) will also receive a briefing on first aid for white phosphorus burns. First aid for this type of burn is complicated by the fact that white phosphorus particles ignite upon contact with air. Burns with imbedded white phosphorus must be kept wet until all of the particles can be removed and it is essential to obtained professional medical support as soon as possible.

8.3 OFF-SITE MEDICAL SUPPORT

The nearest medical facility to Fort McClellan that can provide medical support for trauma cases is Regional Medical Center, 400 E. 10th Street, Anniston, AL 36202, 256-235-5121 or 911 for emergency services. Emergency contact numbers for the facility are provided in Chapter 10.0. For non-emergency medical services, site personnel may use the Work Care Facility – Southern Family Practice and Occupational Medicine, 700 Quintard Avenue, Anniston, Alabama 36201,

256-236-9400. Attachment 3 presents the route maps and driving directions to the hospital and Work Care Facility.

8.3.1 Those employees on site who hold current first aid/CPR certification are authorized to stabilize an injured person until emergency medical services can be brought to the accident/injury scene to treat and transport the victim. They have the skills to perform an initial assessment of the victim's injuries; open an airway and provide rescue breathing; control bleeding; manually stabilize skeletal and spinal injuries; treat shock; perform an emergency movement of the victim; and, administer CPR. A fully equipped first aid kit will be available on site. This kit will be equipped with the supplies necessary to treat white phosphorus burns including a burn blanket and an ample supply of sterile water.

9.0 PERSONAL PROTECTIVE EQUIPMENT

9.1 PPE HAZARD ASSESSMENTS

The PESM has reviewed all applicable work plans, site historical records, and other available information and has evaluated each major work activity to determine the appropriate level of personal protective equipment needed for the work. This evaluation included a consideration of: potential hazards present; work operations to be performed; potential routes of exposure; concentrations of contaminants present; characteristics, capabilities and limitations of PPE; and, any hazards that the PPE may create or exacerbate (i.e. heat stress). Evaluation findings and recommendations are listed in the AHA matrix and include the date the evaluation was conducted, the activity evaluated, PPE recommendations, and the name of the person(s) performing the assessment.

9.1.1 The initial level of PPE selection, as required by 29 CFR 1910.132, includes hard hat when overhead hazards are present, safety glasses, safety boots that comply with ANSI Standard Z4 (except during geophysical mapping or UXO Locator Operations), leather work gloves, work clothes, ear plugs when around power tools and heavy equipment, and weather appropriate clothing. Additional PPE requirements when working in the lead contaminated areas and during demolition of the tire house are discussed in the Lead Compliance Plan (Attachment 5).

9.1.2 PPE selection shall be made by the UXOSO and approved by the PESM. Additional tasks not included in the AHA matrix shall be reviewed by the UXOSO and PESM. Any additional PPE requirements will be incorporated into the APP by completing a field change request (FCR) form. All FCR forms and PPE selection will require approval by the PESM.

9.1.3 Modifications to the initial PPE selection may also be made by the UXOSO in consultation with the PESM using the FCR form. A written justification for major downgrades will be provided to the PESM for approval.

9.2 HAZARD ASSESSMENT FOR SELECTION OF PPE

The initial levels of protection were selected by performing a hazard assessment taking into consideration the following:

- Potential site physical hazards present or suspected.
- Work operations to be performed.
- Potential routes of exposure.
- Characteristics, capabilities and limitations of PPE, and any hazards that the PPE presents or magnifies.

9.3 PPE USE AND MAINTENANCE

Employees assigned to use PPE are required to inspect the equipment before and after each use; discard any equipment that is defective; clean and maintain the equipment according to manufacturer's recommendations; and, store their PPE in a clean, secure area on site each day. Specific PPE inspection, cleaning, and maintenance procedures vary according to the type of equipment being used. Employees will be informed of these equipment-specific use and maintenance procedures prior to being assigned to their jobs. Training in PPE equipment inspection, cleaning, and maintenance protocols will be provided during the requisite 40-hour Hazardous Waste Operations course.

10.0 PLANS REQUIRED BY THE SAFETY MANUAL EM 385-1-1

Table 10-1 summarizes the project-specific activities that may or may not require the development of special operating procedures or plans as mandated by the US Army Corps of Engineer's Safety and Health Requirements Manual (EM 385-1-1). Individual plans will be produced and included in the Appendices of this APP for each anticipated activity that is regulated under EM 385-1-1 and for which plans are required. Similarly, special operating procedures will be developed and described in the SSHP for other anticipated activities that need not be addressed in a separate plan but must be discussed otherwise as required by relevant sections of EM 385-1-1.

10.1 SITE LAYOUT PLANS

TtEC will use on-site existing office space for our field office, located in building 215 on Jimmy Parks Boulevard. This will be the support area for all field activities. Exclusion zones will be established as appropriate during field activities. Exclusion zone maps are provided in Appendix B of the Work Plan.

10.2 EMERGENCY RESPONSE PLANS

This paragraph establishes procedures and provides information for use during a project emergency. Emergencies occur unexpectedly and quickly, and require an immediate response. Therefore, contingency planning and advanced training of all project staff are essential. An emergency plan is required by OSHA (29 CFR 1910.120) and EM 385-1-1. A copy of this plan will be posted (or otherwise available) at each work site.

10.2.1 Procedures and Tests

10.2.1.1 Potential Emergencies

There are several emergencies that could reasonable be expected during the project activities, including

- Worker injuries, slips, trips, falls and illness;
- Thermal Stress;
- Bites/stings from indigenous snakes, scorpions, bees/wasps and spiders; and,
- Fires and Explosion

10.2.1.2 Personnel and Lines of Authority

The PESM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and all pre-emergency requirements are met. The

Table 10-1. Required Plans for Project-Specific Activities

Activity	EM 385-1-1 Reference	APP Paragraph (if anticipated)	Activity Not Anticipated
Site layout plans	04.A.01	X	
Emergency response procedures & tests	01.E.01	X	
Spill plans	01.E.01 & 06.A.02	X	
Firefighting plan	01.E.01 & 19.A.04	X	
Posting of emergency phone numbers	01.E.05	X	
Wild land fire prevention plan	09.K.01		X
Man overboard/abandon ship	19.A.04		X
Hazard communication program	01.B.06	X	
Respiratory protection plan	05.E.03	X	
Health hazard control program	06.A.02		X
Lead Compliance Plan*	06.B.05	Attachment 5	
Asbestos abatement plan	06.B.05		X
Abrasive blasting plan	06.H.01		X
Confined space	06.I		X
Hazardous energy control plan	12.A.07		X
Critical lift procedures	16.C.18		X
Severe weather contingency plan	19.A.03	X	
Access and haul road plan	8.D.1		X
Demolition plan	23.A.01	X	
Emergency rescue (tunneling)	26.A.05		X
Underground construction fire prevention and protection plan	26.D.01		X
Compressed air plan	26.I.01		X
Formwork and shoring erection and removal plans	27.B.02		X
Jacking and slab plans	27.D.01		X
Site Safety and Health Plan *	28.A.02	Attachment 2	
Blasting plan	29.A.01	X	X
Diving plan	30.A.13		X
Alcohol and drug abuse prevention plan	DFARS 252.223-7004		X
Fall protection plan	Sec. 21		X
Steel erection plan	27.E.01		X
Night operations lighting plan	16.C.19.d		X
Site sanitation plan	Sec. 02		X
Fire prevention plan	09.A.01	X	
Excavations	Sec. 25	X	
Scaffolding	Sec. 22.B		X
Machinery and mechanized equipment	Sec. 16	X	
Electrical safety	Sec. 11		X
Public safety requirements	04.A.04		X

Notes: *** Denotes activities for which plans have been developed and which have been included in the Attachment.**

PESM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents and fatalities.

10.2.1.2.1 The SUXOS will be responsible for the overall direction and implementation of this Emergency Response Plan (ERP), and for overall coordination of any emergency response actions. The SUXOS will be assisted as necessary and requested, by the UXOSO and other site personnel. The SUXOS may be task the UXOSO and others with taking responsibility for specific activities during an emergency. Specific responsibilities of the SUXOS include, but are not limited to, the following:

- Notifying local police, fire department, and other off-site emergency units, as required;
- Notifying the TtEC PM and providing updates as conditions change;
- Directing off-site emergency response personnel to the scene and providing assistance;
- Providing medical background information of the sick/injured and applicable site health and safety information to the off-site emergency medical responders;
- Establishing emergency site control;
- Accounting for all site personnel and visitors;
- Ensuring that all machinery and processes are shut down or stabilized in the event of a stop work order or evacuation;
- Rescuing personnel;
- Providing for emergency first aid;
- Preventing further injury of personnel;
- Assisting on-site emergency response personnel with treatment and transport of sick/injured;
- Ensuring that on-site emergency response personnel don the proper PPE if needed;
- Accompanying sick/injured personnel to hospital when possible.
- Providing frequent situation updates to the TtEC PM and PESM; and,
- Completing any follow-up reports.

10.2.1.2.2 All TtEC personnel and visitors shall be responsible for:

- Reporting any site emergencies to the UXOSO;
- Knowing the exit location and evacuation route within the exclusion zone;

- Knowing the pre-planned evacuation assembly point and going there in the event of an emergency; and
- Assisting emergency response personnel as required.

10.2.1.3 Safe Distances and Places of Refuge

The SUXOS or UXOSO shall determine safe distances and places of refuge based on operational and safety considerations for the site. Prior to the beginning of the field work, the SUXOS and UXOSO shall hold a safety meeting with all personnel and discuss the following:

- Evacuation routes from work areas;
- The assembly point to be used in the event of an emergency;
- Locations of the nearest fire extinguishers and spill containment equipment; and
- Discussion of specific health and safety concerns of personnel.

10.2.1.3.1 Evacuation routes and emergency procedures will be discussed with field staff again whenever changes are made, or as necessary to ensure the safety of site personnel.

10.2.1.4 Evacuation Procedures

The SUXOS and/or UXOSO shall establish evacuation routes. Evacuation notification shall be three long blast on an air horn or vehicle horn. Notification may also be via direct verbal communication. If evacuation is necessary, all personnel are to:

- Gather equipment to the extent safely possible;
- Evacuate to the vehicle(s) location, prepare to move out; and
- The UXOSO shall account for all personnel and notify the SUXOS.

10.2.1.5 Medical Emergency Procedures

Any person(s) who become ill or injured during work activities must immediately inform the UXOSO, regardless of the severity of the illness or injury. The individual shall be medically evaluated by the UXOSO. In the event that the medical emergency is severe enough, the UXOSO shall order a cessation of work and notify off-site emergency personnel. All personnel at the work site shall use the buddy system and shall stay within sight of their partner. In the event that a cessation of work is ordered, all personnel will:

- Assist the UXOSO, if required, in administering first aid;
- Leave the area if the hazard warrants such action;
- Assist emergency response personnel when requested and meet them at the entrance (or other applicable location) for escort to the site

10.2.1.5.1 If the medical emergency is not severe, the individual shall be transported to local medical facility nearest the site. The UXOSO shall accompany the injured party to the hospital and provide hospital personnel with the individual's medical background, as well as details regarding how the injury/illness occurred. Directions to the nearest medical facility area provided in Attachment 3.

10.2.1.5.1 Emergency Response

Some physical signs/symptoms that require emergency medical treatment and a call to 911/ambulance service include: chest pain, difficulty breathing, uncontrolled bleeding, bone fracture, loss of consciousness, severe head injury, poisoning, shock, loss of limb, and sudden and prolonged dizziness. In an emergency situation:

- Call 911 for initial employee evaluation and transport to the hospital. A designated TtEC employee shall accompany the injured worker to the hospital.
- Administer first aid to minimize the injury effects.
- Call WorkCare at 1-800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Mention ASAP that the call is regarding an emergency injury. The Occupational Health Nurse will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare:
    - Name of Supervisor calling;
    - Phone Number;
    - Location calling from;
    - Name of individual injured and social security number; and
    - Date and type of injury.
- During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. Do not delay treatment while awaiting a return phone call.
- Call the PESM, Project Manager, and USAESCH contact.

10.2.1.5.2 Non-Emergency Response

In a non-emergency situation:

- Administer first aid to minimize the injury effects.
- Call WorkCare at 1-800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Mention ASAP that the call is regarding an injury. The Occupational Health Nurse will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare:
    - Name of Supervisor calling;

  - Phone Number;
  - Location calling from;
  - Name of individual injured and social security number; and
  - Date and type of injury.
- During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. Do not delay treatment while awaiting a return phone call.
- Call the PESM, Project Manager, and USAESCH contact.
- Call the local WorkCare clinic at 580-355-9675 to notify them that you are bringing an injured worker to their clinic for evaluation. Attachment 3 contains the directions to the local Work Care facility.
- You may transport the injured employee to the local clinic in a privately owned vehicle. A designated TtEC employee must accompany the injured worker to the local clinic.

10.2.1.5.3 After Emergency and Non-Emergency Treatment

After emergency and non-emergency treatment:

- Obtain treatment and medical release records for the injured worker and forward to WorkCare and the PESM.
- The PESM will contact TtEC worker's compensation carrier (AIG –AON at 800-910-2667 within 24 hours of injury.
- Seek ways to ensure the worker can work, including alternate work.
- Regularly follow-up with the PESM who will verify and notify WorkCare and AIG-AON case representatives.

These procedures are also captured in TtEC's Zip Bulletin, Issue Number 108, *Improving Injured Worker Case Management*, which is Attachment 4 of this report.

10.2.2 Fire and/or Explosion Procedures

In the event of any fire or explosion, the SUXOS, or his designee, will:

  - Start immediate response actions appropriate for the emergency;
  - Determine the extent of the fire;
  - Remove or isolate flammable or other hazardous materials, which may contribute to the fire;
  - Coordinate and manage fire suppression efforts until a determination is made to evacuate or the fire is put out;

- Coordinate the evacuation of injured or non-essential personnel from the site following the evacuation procedure; and Notify the local fire and medical services, as appropriate;
- Provide emergency first aid as required;
- Assist emergency response personnel when requested and meet them at the entrance (or other applicable location) for escort to the site
- Advise emergency response personnel of the location, nature, and identification of the hazardous materials on site; and,
- Notify the PESM and PM of the emergency.

10.2.2.1 Fires containing explosives will not be fought by site personnel. The responding fire department personnel (if available) will be informed of the nature of the fire and if explosives are present. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage)

10.2.3 Spill Plans

The SUXOS is responsible for conducting cleanup operations in the event of a spill of hazardous material (i.e. fuel or oil from field operations). The SUXOS will manage the collection of the spilled material with sorbent materials, shovels and plastic bags. All material will be properly disposed of in accordance with applicable regulations. The PESM will assist the SUXOS in determining the appropriate disposal procedures.

10.2.4 Fire Prevention

Adhering to the following precautions will help prevent fires:

- Good housekeeping and proper storage of materials;
- Storage of flammable liquids and gases away from oxidizers;
- Prohibition of smoking in the exclusion zone or work areas;
- Use of non-sparking power tools;
- Prohibition of power tool use in heavily vegetated areas or pre-wetting of vegetation to prevent burning;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;
- Use of UL approved flammable storage cans;

10.2.4.1 Fire extinguishers rated at least 10 pounds ABC shall be located on all heavy equipment, in all field vehicles and near all work areas. Fire extinguishers will be inspected monthly. The UXOSO will be responsible for this inspection.

10.2.5 Posting of Emergency Telephone Numbers

The emergency telephone numbers for the site are contained in Table 10-2. A copy of this table will be kept in each field vehicle and will be ready available in each work area. Copies will be provided to subcontractors and site visitors as needed.

Table 10-2
Emergency Telephone Numbers

Contact	Firm or Agency	Telephone Number
Police Department	Anniston Police Department	256-238-1800 or 911
Fire Department	Anniston Fire Department	256-237-3541 or 911
Ambulance	Anniston Rescue Squad	256-237-8572 or 911
Emergency Medical Facility	Regional Medical Center 400 E. 10th Street Anniston, AL 36202	911 or 256-235-5121
Work Care Facility	Southern Family Practice and Occupation Medicine 700 Quintard Avenue Anniston, AL 36201	256-236-9400
Program Manager, Art Holcomb	TtEC	256-430-3701 or 770-331-4195
Project Manager, Don Welch	TtEC	256-580-2999 or 256-454-4451
PESM, Stephen Neill	TtEC	(770) 330-7068 (cell phone)
USACE Contracting Officer, Wanda Hampton	USAESCH	256-895-1061
USACE Project Manager, Allyn Allison	USAESCH	256-895-1121
Transition Force, Lisa Holstein	Transition Force	256-848-7455
Transition Force, Scott Bolton	Transition Force	256-848-6561
Poison Control Center	Poison Control Center	(800) 222-1222
Chemtrac	CHEMTRAC	(800) 424-9300
National Response Center	National Response Center	(800) 424-8802

10.2.6 Emergency Response Drill

During the first fully operationally week on site, the SUXOS and/ or UXOSO will conduct an emergency response drill in order to evaluate the effectiveness of the emergency plan. Following the drill, the plan will be reviewed and performance documented.

10.3 HAZARD COMMUNICATION PROGRAM

The program establishes procedures for TtEC employees who handle and store chemical products at TtEC sites. It ensures that hazards of all chemicals purchased are evaluated and the information concerning their hazards is transmitted to employees. The delivery of information is to be accomplished by employee training, container labeling, and other forms of warning and material safety data sheets (MSDS). All MSDS will be requested from the suppliers at the time of order. If not available, then a recent MSDS will be downloaded off the internet. MSDS for this project will be obtained by the UXOSO and kept available on site. The SUXOS or his designee must ensure that project personnel can immediately obtain the required information about chemicals of concern during an emergency.

10.4 CONTINGENCY PLAN FOR SEVERE WEATHER

Daily weather conditions will be a part of the daily briefing. Many people incur injuries or are killed due to misinformation and inappropriate behavior during severe weather. During severe weather project personnel will seek shelter in an appropriate location (i.e., building or vehicle). The individual is ultimately responsible for his/her personal safety and has the right to take appropriate action when threatened by severe weather.

10.4.1 Safer Locations during Severe Weather & Locations to Avoid

No place is absolutely safe from severe weather; however, some places are safer than others. Large enclosed structures (substantially constructed buildings) tend to be much safer than smaller or open structures. The risk for lightning injury depends on whether the structure incorporates lightning protection, what construction materials were used, and the size of the structure. In general, fully enclosed metal vehicles such as cars, trucks, buses, vans, etc. with the windows rolled up provide good shelter from many weather conditions.

10.4.1.1 During severe weather **AVOID** being in or near high places and open fields, isolated trees, rain shelters, communications towers, flagpoles, light poles, bleachers (metal or wood), metal fences, water (lakes, streams, rivers, etc.). When inside a building **AVOID** use of the telephone, washing your hands, or any contact with conductive surfaces with exposure to the outside such as metal door or window frames, electrical wiring, telephone wiring, cable TV wiring, plumbing, etc if lightning is a factor.

10.4.2 Safety Guidelines for Individuals

Generally speaking, identify and seek shelter that is appropriate for the type of severe weather being encountered. Proper shelter will always include a sound structure and remove you from the elements. When available, pay attention to weather warning devices such as weather radio and/or credible weather detection systems, however, do not let this information override good common sense.

10.5 SITE SANITATION

The following sanitation provisions will be established and maintained for the duration of this project.

10.5.1 Drinking Water

An adequate supply of cool water will be supplied and will be kept in water coolers or individual bottles on site. When in use, the water cooler will be kept closed and will be labeled "Potable Water".

10.5.2 Toilet Facilities

TtEC will provide portable toilets for the project site. The toilets will be equipped with toilet paper, toilet paper holder, washing facilities, locking door, and adequate ventilation.

10.5.3 Waste Disposal

A trash receptacle will be present at the site for the disposal of hand drying materials, any disposable PPE, paper towels used to dry hands and other non-hazardous, non-MEC/UXO waste generated.

ATTACHMENT 1

ACTIVITY HAZARD ANALYSES

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TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	1. Exposure to MEC	• Follow the procedures detailed in Chapters 2.0, 3.0 and 4.0 of the Work Plan, Chapter 2.0 of the SSHP and reference EP 385-1-95a. • A UXO Tech will survey work areas with a magnetometer before the driving of stakes in the ground or performing other intrusive activities. • Only UXO qualified personnel will assess and handle MEC/UXO after it has been determined to be safe. • All MEC will be handled with care. Do not drop or throw • UXO personnel will not handle or move MEC/UXO unless a positive identification can be made. • UXO personnel will not move MEC or UXO potentially containing all-ways-acting fuzes.
☒ Mob/Demob ☒ Boundary Surveys ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	2. Back Injuries and strains	• Procedures in Paragraph 2.1.5.7 of the SSHP will be followed. Site personnel will be instructed on proper lifting techniques (keep back straight, lift with legs, limit twisting, etc.). • Mechanical devices should be used to reduce manual handling of materials. • Team lifting should be utilized if mechanical devices are not available. • An individual will not lift loads greater than 50 pounds.
☒ Mob/Demob ☒ Boundary Surveys ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	3. Slips/Trips/Falls	• Visually inspect work areas and mark, barricade, or eliminate slip, trip and fall hazards if feasible. • Maintain work areas safe and orderly (proper housekeeping EM 385-1-1 Section 14.C). • Unloading areas should be on even terrain. • Watch and prepare for uneven terrain, stumps, and vegetation in walk areas. • Replace work boots when worn out or the tread on the sole does not provide traction. • Tools and supplies/equipment will be properly stored.

TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	4. Sharp Objects/punctures	• Leather (minimum) or cut resistant gloves will be worn depending on the material working with. • All hand and power tools will be maintained in a safe condition. • When possible, blunt all sharp objects. • First aid kits will be available by the work area.
☐ Mob/Demob ☐ Boundary Surveys ☒ **Brush Clearance** ☐ MEC Surface Sweeps ☐ Geophysical Mapping ☐ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	5. Noise	• Reference the applicable provisions of EM 385-1-1 Section 5.C. • Reference Paragraph 2.1.5.4 of the SSHP • Hearing protection with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs) will be worn during heavy equipment and metal cutting operations (equipment operator and workers within 50 feet). • All equipment will be equipped with manufacturer's required mufflers. • Workers will be given auditory exams and hearing conservation training yearly.
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	6. Eye Injuries	• Reference the applicable provisions of EM 385-1-1 Section 5.B. • ANSI approved safety glasses meeting Z87.1 will be worn for all field operations. • A portable 15-minute eye wash station will be located adjacent to work activities.
☐ Mob/Demob ☐ Boundary Surveys ☒ **Brush Clearance** ☐ MEC Surface Sweeps ☐ Geophysical Mapping	7. Overhead Hazards	• Reference the applicable provisions of EM 385-1-1 Section 5.D. • Personnel will be required to wear hard hats that meet ANSI Standard Z89.1 when involved in operations that have overhead hazards. • All ground personnel will stay clear of suspended loads and equipment swing areas. • All equipment will be provided with guards, canopies or grills to protect the operator from

TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
☐ Manual MEC Clearance ☒ Shoot House Demolition ☐ MEC Disposal Ops		falling or flying objects. • All overhead hazards will be identified prior to commencing work operations. Reference the applicable provisions of EM 385-1-1 Section 5.B.
☐ Mob/Demob ☐ Boundary Surveys ☒ **Brush Clearance** ☐ MEC Surface Sweeps ☐ Geophysical Mapping ☐ Manual MEC Clearance ☒ Shoot House Demolition ☐ MEC Disposal Ops	8. Heavy Equipment Operation	• Supervisors and operators will ensure that the procedures in Paragraph 2.1.5.2 of the SSHP, applicable provisions of Section 16 (Machinery and Mechanized Equipment) of EM 385-1-1, and the equipment manufacturers' instructions and recommendations are followed consistently (Summary below). • All equipment will be initially inspected to certify that it is safe to use on site. Equipment will also be inspected before daily use. • Unsafe equipment will be taken out of service. It will be tagged and it will not be placed backing service until it has been repaired and function tested repaired. • Only operators trained, experienced and certified (documented) with the specific equipment will operate that equipment. • Equipment will have rollover protective structures and seat belts. Seat belts will be worn by equipment operators at all times. • Equipment will have guards, canopies or grills to protect ground personnel and the operator from flying objects. • Equipment will not be operated on grades that exceed manufacturer's recommendations. • Personnel will stay clear of suspended loads; slings chains and ropes will be rated for the load they are expected to lift (EM 385-1-1 Section 15). • Drip pans, polyethylene sheeting or other means will be available for spill containment. • Staff will make eye contact with operators before approaching equipment and will not approach on blind sides. • Avoid equipment swing areas. Marking caution tape will define the swing area of the rear of the excavators • Know site hand signals (Table 3-1). • All equipment will be equipped with backup alarms. • The use of headphones for entertainment purposes is prohibited. • A 15-foot minimum safe separation distance will be maintained between equipment and

TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
		overhead utility lines. • Equipment parked on an incline shall have the wheels chocked or track mechanisms blocked, buckets/blades grounded and the parking brake set. • Equipment will be shut down before and during fueling operations. • A spotter will be used for backing up equipment in congested areas.
☒ Mob/Demob ☐ Boundary Surveys ☒ **Brush Clearance** ☐ MEC Surface Sweeps ☐ Geophysical Mapping ☐ Manual MEC Clearance ☒ Shoot House Demolition ☐ MEC Disposal Ops	9. Spills	• Reference Paragraph 6.14.3 and the applicable provision of EM 385-1-1 Section 14. • Reference Paragraph 11.5.10 of the APP • Spill and absorbent materials will be readily available. • Contain, control and clean up the spill and affected area (soil, water). • Manage and dispose of spill material appropriately. • All waste materials generated will be contained in 55-gallon drums.
☒ Mob/Demob ☐ Boundary Surveys ☐ Brush Clearance ☐ MEC Surface Sweeps ☐ Geophysical Mapping ☐ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	10. Chemicals Brought On Site	• Reference the applicable provisions of EM 385-1-1 Section 6.B. • Identify all chemical hazards and receive training (Haz Com-Material Safety Data Sheets/MSDS) regarding safe handling and storage of chemicals. • The UXOSO will maintain copies of all MSDS for chemicals that are on site including those brought to the site by subcontractors. • Ensure all chemicals have proper labels and warning notifications

TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	11. Fire	• Reference Paragraph 2.1.5.5 of the SSHP and the applicable provisions of EM 385-1-1 Section 9. • Only use NFPA-approved fuel cans with a pouring spout or funnel. • Smoking and open flames are not permitted with/in 50 feet of fueling areas. • A 2A:20B:C fire extinguisher will be located at each work site within the exclusion zone; and, a 4A:20B:C fire extinguisher will be located within 50 to 75 feet of all flammable/combustible liquid storage areas and refueling points. • All gasoline-powered equipment will be grounded before fueling. • Equip all heavy equipment with BC-type fire extinguishers. • Dry brush will be cleared for 25 feet around MEC cutting operations • Additional fire fighting equipment will be available during MEC cutting operations
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	12. Biological Hazards; poisonous plants, stings, bites, allergic reaction, rabies and claw wounds.	• Follow and train personnel on the procedures outlined in Paragraph 2.2 of the SSHP and the applicable provisions of EM 385-1-1 Section 6.D. • Avoid putting hands into hidden areas, holes, burrows, under structures, etc. • Be alert when walking; snakes may be present on roadways or in streambeds. • Wear insect repellent and long sleeved shirts as needed. Wear light colored clothing to highlight ticks. • Follow procedures for tick bites. Perform self and buddy checks frequently throughout the day. • Be aware of poisonous plants; poison ivy blocking lotion will be used. Review the procedures in the SSHP (Paragraph 2.3.3) for preventative measures. • If evidence of biological hazards exists, review the procedures in the SSHP (Paragraph 2.3) and coordinate with the UXOSO for control measures. • If allergic to bees/wasps, ensure an epinephrine (MSDS needed on site) kit is readily available. Make sure the UXOSO and SUXOS are informed of the condition and that the Medical Data sheet is updated and contains the necessary information.
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance**	13. Temperature Extremes	• Site personnel will be trained about signs and symptoms of heat/cold stress; • Follow procedures in Paragraph 2.2.1 and 2.2.2 of the SSHP for training and monitoring of employees.

TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops		• The UXOSO will monitor daily temperatures and determine work/rest schedules.
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	14. Lightning	• Reference EM 385-1-1 Section 6.J. • Follow the 30-second rule (time between lightning strike and thunder) for shutdown of operations, or as determined by the UXOSO. • Seek shelter in building (preferred) or vehicle. Immediately suspend operations when lightning is in the immediate vicinity and seek shelter.

TETRA TECH EC, INC.

Activity Hazard Analyses

Project: Charlie Area Removal Action **Location: Fort McClellan, Alabama**
Activity: All (As Marked Below) **Analyzed By/Date: Steve Neill, PESM / November 2008**

APPLICABLE TASKS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
☒ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☒ MEC Disposal Ops	15. High Wind	• Reference EM 385-1-1 Section 6.J. • Ensure that all debris/materials are secured. • Shut down operations when wind speed is greater than 30 mph sustained.
☐ Mob/Demob ☒ Boundary Surveys ☒ **Brush Clearance** ☒ MEC Surface Sweeps ☒ Geophysical Mapping ☒ Manual MEC Clearance ☒ Shoot House Demolition ☐ MEC Disposal Ops	15. Potential Exposure to Lead	• All personnal performing MEC clearance activities in those areas that exceed the industrial SSSL and the shoot house demolition will undergo medical monitoring for lead (i.e., blood tests taken before and after demolition and removal) to assess their potential for lead exposure during site activities. • Air monitoring (e.g., dust monitoring) will be performed during the shoot house demolition or where there exists a potential for worker exposure to lead via inhalation of contaminated dust. • Proper PPE as described in the Lead Compliance Plan (Attachment 5) will be worn by site personnel. • Refer to the Lead Compliance Plan for procedures to minimize potential exposure to lead during site activities.

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TETRA TECH EC, INC.	**ACTIVITY HAZARD ANALYSIS** **EQUIPMENT HAZARDS AND INSPECTION REQUIREMENTS**

Project Name:	Charlie Area Removal Action	**Location:**	Fort McClellan, Alabama
Analyzed/Approved By:	**Stephen Neill, PESM**	**Date:**	**November 2008**

EQUIPMENT USED	POTENTIAL HAZARDS & INSPECTION REQUIREMENTS	PROTECTIVE MEASURES/CONTROLS & TRAINING REQUIREMENTS
☒ Level D PPE	1. Pre-use inspection 2. Weekly inspection	1. UXO personnel must read and comply with the provisions of the Work Plan, Accident Prevention Plan and the incorporated SSHP. 2. Site-specific training must be provided to inform personnel of specific hazards (explosive, physical and biological) found at each project site. 3. At least 2 individuals on-site must have current CPR and First Aid training 4. UXO personnel will be instructed in the proper use of fire extinguishers. 5. UXO personnel will be instructed in the proper use of hand and power tools (if any) used on site.
☒ First Aid Kits	1. Pre-use inspection 2. Weekly inspection	
☒ Portable Eye Wash	1. Pre-use inspection 2. Weekly inspection	
☒ Fire Extinguishers	1. Pre-use inspection 2. Monthly inspection	
☒ Site Vehicles	1. Pre-use inspection 2. Daily inspection	
☒ Heavy Equipment	1. Pre-use inspection 2. Daily inspection	
☒ Hand & Power Tools	1. Pre-use inspection 2. Daily inspection	
☒ Office Equipment	1. Pre-use inspection 2. Weekly inspection	
☒ Demo Kits	1. Pre-use inspection 2. Weekly inspection	

NOTE: Some of the equipment listed in this table may be provided by the client (prime contractor). In that case, inspection and maintenance of the equipment will be the responsibility of the client (prime contractor)

2

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ATTACHMENT 2

SITE SPECIFIC SAFETY AND HEALTH PLAN

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Final

SITE-SPECIFIC SAFETY & HEALTH PLAN

Remedial Action in Charlie Area for Four Lead Removal Sites at Fort McClellan, Alabama

Prepared For:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

Unrestricted Comprehensive Environmental Contract
Contract Number: W912BV-04-D-0011
Delivery Order 0010

Prepared By:
Tetra Tech EC, Inc.
4960 Corporate Drive, Suite 140
Huntsville, Alabama 35805

December 2008

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This Site-Specific Safety and Health Plan (SSHP) has been prepared in accordance with DID MR-005-06 to address the hazards associated with work activities at Fort McClellan. By their signatures, the undersigned certify that this SSHP will be utilized for the protection of the health and safety of employees during work activities at Fort McClellan.

APPROVALS:

Donald Welch Jr 11/13/08

Donald Welch Date:
Project Manager

S W Neill 11/09/08

Stephen Neill Date:
Project Environmental and Safety Manager

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Acronym List

ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CIH	Certified Industrial Hygienist
CMC	Corporate Medical Consultant
CPR	Cardiopulmonary Resuscitation
CRL	Corporate Reference Library
CWM	Chemical Warfare Materiel
DID	Data Item Description
EOD	Explosive Ordnance Disposal
ESS	Explosive Safety Submission
EZ	Exclusion Zone
HTRW	Hazardous, Toxic and Radioactive Waste
OJT	On-the-Job Training
OSHA	Occupational Safety and Health Administration
PESM	Project Environmental and Safety Manager
PDS	Personnel Decontamination Station
PM	Project Manager
PPE	Personal Protective Equipment
SSHP	Site Safety and Health Plan
SUXOS	Senior UXO Supervisor
SZ	Support Zone
TtEC	Tetra Tech EC, inc.
UL	Underwriters Laboratory
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
UXOSO	UXO Safety Officer
WP	White Phosphorus

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1.0 INTRODUCTION

1.1 SCOPE AND APPLICABILITY

The Site-Specific Safety and Health Plan (SSHP) establishes policies and procedures to protect workers and the public from the potential hazards posed by site work at Fort McClellan. The elements of this plan comply with the informational requirements of Occupational Safety and Health Administration (OSHA) (29 Code of Federal Regulation (CFR) 1910.120. [b][1] and 29 CFR 1926.65[b][4][ii]), USACE (Safety and Occupational Health Document Requirements for Hazardous, Toxic and Radioactive Waste, Ordnance and Explosive Waste (OEW) Activities, ER 385-1-92 and Section 28B in the USACE Safety and Health Requirements Manual, Engineering Manual (EM) 385-1-1), and TtEC's Environmental, Health, and Safety programs. This SSHP is an attachment to the Accident Prevention Plan (APP) prepared for Fort McClellan and has been structured as a companion document to be used in conjunction with the APP. Information and guidance already contained in the APP will be referenced in this document and will not be repeated.

1.1.1 Protection of Site Workers and Environmental Safety and Health

The protection of site workers and environmental safety and health are major concerns during site operations. The purpose of this plan is to ensure safe and healthful working conditions at the site. The safety and health organization and procedures contained in this SSHP have been established based upon an analysis of the potential hazards, and personnel protection measures have been chosen based on these risks.

1.1.2 Compliance Required

Compliance with this SSHP is required by all TtEC employees, their contractors, subcontractors and visitors who participate in activities at Fort McClellan. Refusal or failure to comply with the SSHP or violation of any safety procedures by field personnel and/or subcontractors may result in their immediate removal from the site following consultation with the TtEC PESM and the Project Manager (PM).

1.1.3 Corporate Environmental Safety and Health Procedures

There are a number of references to TtEC Environmental Safety and Health Procedures found in the TtEC Corporate Reference Library (CRL). These procedures will be made available to the USAESCH Contracting Officer and other Government personnel as requested. These procedures are proprietary information and include EHS 1-7: Incident Reporting and Investigation, EHS 4-2: Hazard Communication, EHS 4-4: Hearing Conservation, EHS 4-6: Temperature Extremes, and EHS 6-3: Excavation and Trenching.

1.2 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

The responsibilities of the health and safety staff are described in detail in Chapter 3.0 of the APP.

2.0 HAZARD ANALYSIS AND RISK ASSESSMENT

The potential hazards associated with the site activities include chemical, physical hazards (including MEC) and biological hazards. The potential for encountering various hazards will depend on the work being conducted, the location of that work and the time of year. Specific hazards are discussed below.

2.1 CHEMICAL HAZARDS

2.1.1 CWM

It is not anticipated that CWM will be encountered at Fort McClellan. However, in the event of CWM discovery, all personnel will evacuate the area immediately in an upwind direction. The SUXOS will notify the PM, PESM, and the OE Safety Specialist. TtEC UXO personnel will standby until response elements arrive on scene or until directed otherwise by the OE Safety Specialist. The SUXOS will notify other personnel listed in Table 10-1 in the APP as required.

2.1.2 HTRW

The four designated areas for MEC removal activities (Bains Gap Road Ranges, Range 20, Range 24A, and the 81mm Mortar Range) have known areas that contain lead contamination above the industrial site-specific screening level (SSSL) for lead (i.e., 880 mg/kg). The SSSL were developed for human health and ecological risk evaluations as part of the ongoing site investigations performed under the BRAC Environmental Restoration Program at Fort McClellan (IT, 2000). In addition, the tire house is known to be contaminated with bullet lead and has the potential for containing lead contaminated materials. Therefore a Lead Compliance Plan (Attachment 5 of the APP) has been developed to address the potential for worker exposure to lead during onsite activities. Since lead levels have not been determined in the tire house materials, samples will be collected prior to demolition of the structure to determine lead levels as well as characterize the material for disposal.

2.1.3 MEC/Explosives

The areas where work will be conducted may contain MEC/UXO or related debris. Only UXO qualified personnel per DID OE-025 are authorized to handle MEC material. MEC has the potential to kill or cause serious injury if improperly handled. Operations involving MEC are inherently dangerous and require strict adherence to safe practices, safety procedures, and positive control of personnel. Due to the nature of MEC items that may be encountered, all site workers must be vigilant in identifying hazards at the work site and bringing them to the attention of supervisory personnel. As additional hazards are identified, protective measures will be implemented. Surface sweeps will be performed in each investigation area by a UXO technician or team prior to geophysical mapping or intrusive investigation to be conducted. For

the surface sweeps and subsurface investigations, the field personnel will follow the field procedures specified in Chapter 2.0 of the approved work plan and safety concepts/considerations specified in Basic Safety Concepts and Considerations for Ordnance and Explosives Operations, EP 385-1-95a, 27 August 2004.

2.2 PHYSICAL HAZARDS

2.2.1 Heat Stress

There is a potential for heat stress and related injuries during the performance of the planned activities at Fort McClellan. Heat stress related problems include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. Heat rash occurs because sweat is not evaporating, causing irritation and vesicular inflammation. Standing erect and immobile in the heat allows blood to pool in the lower extremities. As a result, blood does not return to the heart to be pumped back to the brain and fainting may occur. Heat cramps are painful spasms of the muscles due to excessive water and salt loss from profuse sweating. Similarly, heat exhaustion occurs due to the large fluid and salt loss from profuse sweating. Heat exhaustion is characterized by clammy and moist skin, nausea, dizziness, headaches, and low blood pressure. Heat Stroke is characterized by dry skin due to lack of sweating, dry mouth, mental confusion and convulsions. A person exhibiting signs of heat stress should be removed from the work area and moved to a shaded/cool area immediately. The injured person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately. **EARLY RECOGNITION AND PROMPT TREATMENT OF HEAT STRESS SYMPTONS INCLUDING HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.**

Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illnesses. To avoid heat stress, the following steps, as necessary, will be implemented at Fort McClellan:

- Adjust work schedules.
    - Modify work/rest schedules according to monitoring requirements.
    - Mandate work slowdowns as needed.
    - Perform work during cooler hours of the day, if possible, or at night if adequate lighting can be provided.
- Perform physiological monitoring.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels.
    - This is necessary to ensure the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8

ounces (0.23 kilograms (kg)) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

- When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
  - Maintain water temperature at 50° to 60°F (10°-16.6°C).
  - Provide small disposable cups that hold about 4 ounces (0.1 liter).
  - Have workers drink 16 ounces (0.5 liters) of fluid, preferably water or dilute drinks, before beginning work.
  - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break.
  - A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- Train workers to recognize the symptoms of heat-related illnesses.
- Rotate personnel and alternate job functions.
- Utilize cooling vests when impermeable clothing is worn.

Additional procedures to be followed are provided in EHS Program, Temperature Extremes, EHS 4-6.

2.2.1.1 Early symptoms of heat stress related problems may include:

- Decline in task performance;
- Lack of coordination;
- Decline in alertness;
- Unsteady walk;
- Excessive fatigue;
- Muscle cramps; and
- Dizziness.

2.2.1.2 Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illnesses. To avoid heat stress, maintain worker's body fluids and electrolytes at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kilograms) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat.

2.2.2 Cold Stress

Exposure to low temperatures presents a risk to employee safety and health through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity, and reduced dependability of equipment. Work conducted in the winter months can become a hazard for field personnel due to cold exposure. All personnel must exercise increased care when working in cold environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illnesses will be discussed during the health and safety briefing conducted prior to the onset of site activities.

2.2.2.1 Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to 95°F. As hypothermia progresses, depression of the central nervous system becomes increasingly more severe (Table 2-1). This accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness.

Table 2-1
Progressive Clinical Symptoms of Hypothermia

Core Temperature F°	Clinical Signs
95°	Maximum shivering
87°-89°	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated
84°-86°	Progressive loss of consciousness; muscular rigidity; respiratory rate decreases
79°	Victim rarely conscious
70°-72°	Maximum risk of ventricular fibrillation

2.2.2.2 Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20°F. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction. The three general categories of frostbite are:

- Frostnip - A whitened area of the skin which is slightly burning or painful.
- Superficial frostbite - Waxy, white skin with a firm sensation but with some resiliency. Symptomatically feels “warm” to the victim with a notable cessation of pain.

- Deep frostbite - Tissue damage deeper than the skin, at times, down to the bone. The skin is cold, numb and hard.

2.2.2.3 In preventing cold stress, the UXOSO must consider factors relating both to the worker and the environment. Training, medical screening, establishment of administrative controls, selecting proper work clothing, and wind-chill monitoring all contribute to the prevention of hypothermia and frostbite. Recognizing the early signs and symptoms of cold stress can help prevent serious injury. Thus, workers will be trained to recognize the symptoms of hypothermia and frostbite and have appropriate first-aid instruction. When the air temperature is below 50°F the UXOSO will inform workers of the proper clothing requirements and any work practices that are in effect to reduce cold exposure.

- Cold injuries and illnesses recognition and prevention measures will be emphasized during daily safety briefings when the potential for cold injuries and illnesses exists.
- Work will cease under unusually hazardous conditions.
- Phenothiazine (a sedative) and beta blocker drug use will be prohibited.
- A heated area will be available on site.
- Temperature will be recorded daily on site.
- Warm beverages will be available on site.
- The UXOSO will establish a work/rest schedule based upon worker monitoring. At the first sign of uncontrollable shivering the worker will be rested in a heated shelter. Work will be stopped when the air temperature reaches 0°F.
- Workers will be encouraged to layer clothing when air temperature is below 50°F. Clothing that has a high insulation value will be worn under protective garments. Insulated gloves will be worn when the wind chill index is below 32°F (i.e., air temp 50°F and wind speed $\geq$ 20 mph or air temp 40°F and wind speed $\geq$ 5 mph. Insulating dry clothes will be available.

2.2.2.4 Additional procedures to be followed are provided in EHS Program, Temperature Extremes, EHS 4-6.

2.2.3 Heavy Equipment

The work activities planned for this project present physical hazards that are inherent to working around heavy equipment (e.g., potential for “struck by,” “caught between,” noise). Various types of heavy equipment will be utilized during work conducted at Fort McClellan. Working with, or near, heavy equipment poses many potential hazards that can result in serious physical harm. Prior to the start of on-site equipment operations, all personnel will be briefed on the potential hazards posed by these operations. A system of hand signals will be developed to ensure clear communication between the equipment operator and other site personnel. In addition, the following precautions will be taken to help prevent injuries or accidents associated with heavy equipment:

- Brakes, hydraulic lines, signal lights, fire extinguishers, fluid levels, steering mechanisms, tires, horns and other safety devices will be checked and maintained in good working order throughout the duration of field activities;
- Personnel not directly required in the area will be kept at safe distance while equipment is in operation;
- Personnel in the vicinity of heavy equipment (within 25 feet) will wear hard hats orange safety vests and safety glasses. If personnel are operating handheld locators in proximity to heavy equipment they are not required to wear steel-toed boots;
- Personnel directly involved in activities utilizing heavy equipment will avoid moving into the path of equipment while it is in operation. Personnel will avoid areas that are not visible to the equipment operator and spotters will be used when personnel must conduct activities in areas where the equipment operator's view is obstructed;
- Personnel other than the operator will not be allowed on equipment unless that equipment is specifically designed to convey, lift or otherwise move personnel;
- An Exclusion Zone (EZ) will be established around heavy equipment operations. EZs will be based upon the working and maneuvering room required for individual pieces of equipment. For example, when an excavator is in use, extend the bucket to its furthest reach and mark a semi circle in the soil around the front of the excavator. This line can then be used to delineate an appropriate Exclusion Zone around the rear of the excavator;
- Personnel needing to enter the heavy equipment exclusion zone will get the attention of (make eye contact with) the operator and signal their intentions. The operator will secure the equipment (e.g. ground the bucket) and show both hands to the personnel desiring entrance. At that point, entrance is authorized into the equipment EZ;
- Large construction motor vehicles will not be backed up unless the vehicles have a reverse signal alarm that is audible above the background noise of operation, or the vehicles are equipped with backup warning lights and an observer signals it is safe to do so;
- Construction and heavy equipment will be equipped with the necessary and required safety features including seat belts, rollover protection, emergency shut-off protection during rollover, backup warning lights and audible alarms;
- Blades and buckets will be lowered to the ground and parking brakes will be set before any heavy equipment or vehicle is shut off;
- The heavy equipment operator will perform checks and document inspections at the beginning of each shift to ensure all equipment, parts and accessories are in safe operating condition and free of apparent damage that could cause failure while in use;
- Field support vehicles will be equipped with a first-aid kit and appropriate fire extinguisher; and,
- Heavy equipment operators must be trained and qualified in the operation of the equipment. Operators cannot exceed 10-hrs of duty time in any 24-hr period without an interval of 8-consecutive hours of rest.

2.2.4 Hand and Power Tools

In order to complete the various tasks for the project, personnel may utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut and being struck by the tool, as well as the potential for these tools to start fires and cause electrocution.

2.2.5 Noise

Noise is a potential hazard associated with the operation of heavy equipment, detonations and power tools. Excessive noise presents two potential problems at the site. First, it hinders communication among employees. Second, excessive noise exposures (to both continuous and impact noise) can have adverse effects on a person's hearing. These adverse effects include both temporary and permanent hearing damage. Personnel working on this project are to be given an audiogram (hearing test) and hearing conservation training. The PESM or UXOSO will verify these requirements have been met for each site worker. The UXOSO will ensure ear protection such as disposable earplugs, is made available to, and used by, all personnel working near operating heavy equipment or other sources of high intensity noise. Hearing protection is required to be available any time the noise level reaches 85 dbA. Hearing protection is required to be worn if the noise level reaches 90dbA or greater. Hazardous noise placards will be posted as required along the boundary of high noise areas. In order to establish hearing protection requirements, the UXOSO in conjunction with the PESM's recommendations, can either monitor the noise or require the use of hearing protection for all personnel working within 50 feet of the equipment or noise source.

2.2.6 Fire and Explosion

In most cases involving ordnance, some type of movement causes accidental ignition and/or explosion. It is imperative to positively identify ordnance by type and function prior to any excessive movement. Ordnance should also be isolated from ignition sources to reduce the possibility of an explosion or fire. When conducting heavy equipment operations, the potential of encountering fire and explosion hazards exists due to potential underground or overhead utilities and underground gases, as well as contact with buried MEC. In addition, engine malfunction or sparks created by engine components may result in fire and/or explosion. Although fires and explosions may arise spontaneously, they are more commonly the result of carelessness during the performance of site activities such as moving drums, mixing/bulking of site chemicals and re-fueling of equipment (heavy and hand held). Some potential causes of explosions and fires include:

- Mixing of incompatible chemicals, causing reactions that spontaneously ignite due to the production of both flammable vapors and heat
- Ignition of explosive or flammable chemical gas/ vapors by external ignition sources

- Ignition of materials due to oxygen enrichment
- Agitation of shock or friction-sensitive compounds
- Sudden release of materials under pressure

2.2.6.1 To ensure adequate fire protection, the UXOSO will inspect the site to ensure all flammable and combustible materials are being safely stored in appropriately configured storage areas and containers. The UXOSO will also ensure no flammable/combustible materials are stored near any sources of ignition and that sources of ignition are removed a safe distance from storage areas. If necessary, storage areas will be segregated from the remainder of the site through the use of flagging or fencing.

2.2.6.2 Explosions and fires not only pose the obvious hazards of intense heat, open flames, smoke inhalation and flying objects, but may also cause the release of toxic chemicals. Such releases can threaten both on-site personnel and members of the general public living or working nearby. Site personnel involved with potentially flammable material or operations will follow the guidelines listed below and EM 385-1-1, Section 9, to prevent fires and explosions. At a minimum, the following guidelines will be observed:

- Prior to initiation of site activities involving explosive/flammable materials, all potential ignition sources will be removed or extinguished;
- Non-sparking and explosion-proof equipment will be used whenever the potential for ignition of flammable/explosive gases/vapors/liquids exists.
- Smoking will be prohibited at, or in the vicinity of, operations that may present a fire hazard and these areas will be conspicuously posted with signs stating “No Smoking or Open Flame Within 50 Feet”;
- Flammable and/or combustible liquids will be kept at all times in approved, properly labeled metal safety cans equipped with flash arrestors and self-closing lids;
- Transfer of flammable liquids from one metal container to another will be done only when the containers are bonded;
- During fueling operations, motors of all equipment will be shut off;
- Metal drums used for storing flammable/combustible liquids will be equipped with self-closing safety faucets, vent bung fittings, grounding cables and drip pans and will be stored outside buildings in an area approved by the UXOSO;
- Outdoor flammable/combustible materials storage areas will be:
- Lined and surrounded by a dike that is at a minimum 12 inches in height, and of sufficient volume to contain 110 percent of the stored materials or be manufactured with double wall construction.
- Located fifty feet from buildings
- Kept free of weeds, debris, and other combustible materials

- Equipped with an appropriate fire extinguisher. In most cases involving ordnance, some type of movement causes accidental ignition and explosion.

2.2.7 Slips, Trips, and Falls

Working in and around the site will pose slip, trip, and fall hazards due to a number of conditions such as slippery surfaces, loose soils and physical obstacles. Slips, trips, and falls are a leading cause of injuries in field-related work settings, therefore, a concerted effort to identify, control, and eliminate these hazards and the measures needed to reduce or eliminate the possibility of injury will be communicated to all site personnel. Site personnel will be instructed to look for potential safety hazards and immediately inform other site personnel about any new hazards. If the hazard cannot be immediately removed, action must be taken to warn site workers about the hazard. Proper housekeeping must be maintained on site. Small holes and pits along high foot traffic areas should be covered or barricaded to prevent injury.

2.2.8 Manual Lifting

Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods. TtEC's Environmental, Health, and Safety policy states that individual employees are not to lift loads greater than 50 pounds. The following procedure should be used to lift anything, particularly heavier loads, safely:

- Size up the load as to its weight, size and shape;
- Make sure path is clear prior to lifting;
- Place the feet about a foot apart and close to the object for good balance;
- Bend the knees to a comfortable position and get a good handhold;
- Using both leg and back muscles, lift the load straight up, smoothly and evenly. Pushing with the legs, keep the load close to the body;
- Lift the object into carrying position, avoiding twisting movements until the lift is completed;
- Turn the body with changes of foot position, making sure the path of travel is clear; and
- Using both leg and back muscles, comfortably lower the load by bending the knees. When the load is securely in place, release the grip. Setting down the load is just as important as picking it up.

2.2.8.1 The steps listed above also apply to team lifting, with an emphasis on coordination. All team members should start and finish the lifting action at the same time and perform turning movements together.

2.2.9 Adverse Weather

In the event of adverse weather conditions, the UXOSO or designee will determine if work can continue without potentially risking the safety of all field workers. Some of the conditions which may present a potential danger to workers include:

- The presence of Extreme temperatures (> 100 ºF or < 32 ºF)
- The presence of treacherous weather-related working conditions such as hail, snow, rain and high winds (> 30 miles per hour)
- Visible lightning within 10 miles
- Limited visibility (fog)
- Earthquakes and tornadoes
- Other major weather-related conditions or incidents

2.2.10 Electrical Hazards

Overhead power lines and downed electrical wires all pose a danger of shock or electrocution if employees contact or sever them during site operations. Electrical equipment and extension cords used on-site may also pose a hazard to employees. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

2.3 BIOLOGICAL HAZARDS

The following biological hazards may be present at the site. The UXOSO will instruct the field crew in the recognition and procedures for encountering biological hazards at the site. Pictures of indigenous poisonous snakes, insects, and plants will be posted on site.

2.3.1 Insects

Insects, including bees, wasps, and hornets may be present at this site making the chance of a bite or sting very possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition; any individuals who have been bitten or stung by an insect will notify the UXOSO. Field personnel who may have insect allergies will provide this information to the UXOSO prior to commencing work, and will have allergy medication on-site. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and as often as needed throughout the work shift. Apply deet (vapor-active repellent) to any exposed skin surface (except eyes and lips), and apply the permethrin repellent spray to field clothing. Note: Allow the permethrin to dry before using the treated clothing.
- Wear proper protective clothing (work boots, socks and pants).
- When walking in vegetated areas, avoid contact with bushes, tall grass, or brush as much as possible.

2.3.1.1 Mild insect stings or bites should be treated by applying a baking soda paste or ice wrapped in a wet cloth. Bee stingers should be gently scraped off the skin, working from the side of the stinger. The suction device in commercially available snakebite kits can also be used to remove the stinger. If insect bites become red or inflamed or symptoms such as nausea, dizziness, shortness of breath, etc., appear, medical care will be sought immediately. Immediate medical care is essential for person's who are allergic to insect bites/stings. If an allergic person receives a spider bite or insect bite/sting, seek immediate medical attention, keep the victim calm, and check vital signs frequently. Rescue breathing should be given, if necessary, to supply oxygen to the victim.

2.3.2 Spiders

Various spiders may be encountered at Fort McClellan, however, only two spiders in the area are poisonous –the Black Widow and the Brown Recluse. The Black Widow spider varies from dark brown to black in color. Its body is ¼ inch wide and overall size is 1-½ inches with legs extended. Only the female is poisonous and can be determined by the red or yellow hourglass marking the underside of the abdomen. The Brown Recluse has a characteristic fiddle-shaped pattern on their head region. The spider is golden brown with the fiddle being dark brown or black. This spider is not hairy and the fiddle pattern is often shiny. They are about 1/4 to 3/4 inch long. The victim will experience the following if a Black Widow or Brown Recluse spider has bitten them:

2.3.2.1 The spider's bite will feel like a sharp pinprick or may not even be noticed at all. In 15 minutes or less, the person will feel a dull numbing pain in the bitten area. A faint red bite mark appears.

- Black Widow - If the bite is in the lower part of the body or legs, the victim will have muscle stiffness or cramps in their abdomen. If the bite is on the upper body or arms, the victim will have muscle stiffness or cramps affecting the shoulders, back, or chest. Additionally, the victim may experience headache, chills, fever, heavy sweating, dizziness, nausea, vomiting, and severe abdominal pain.
- Brown Recluse - The severity of the bite may vary. The symptoms may vary from no harm at all to a reaction that is very severe. Often there is a systemic reaction within 24-36 hours characterized by restlessness, fever, chills, nausea, weakness, and joint pain. Where the bite occurs there is often tissue death and skin is sloughed off. In some severe cases, a wound may develop that lasts several months.

2.3.2.2 First aid procedures for a Black Widow and Brown Recluse bite are as follows:

- Clean the bitten area with soap and water or rubbing alcohol. Do not apply a constricting band because the black widow venom's action is swift; there is little to be gained by trying to slow absorption with a constriction band.
- To relieve pain, place an ice pack over the bite.
- Keep the victim quiet and monitor breathing.
- Seek immediate medical attention.
- If possible, catch the spider to confirm its identity, even if the body is crushed.

2.3.3 Poisonous Plants

The potential for contact with poisonous plants (i.e., poison ivy, poison oak, and poison sumac) exists when performing fieldwork in undeveloped and wooded areas. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison ivy has white berries and red or yellow foliage in the fall of the year. Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety "down". Poison sumac has white, hairy berry clusters.

2.3.3.1 Contact with poison ivy may lead to a skin rash in susceptible individuals. A rash results from a toxin found in the sap that is extruded from the leaves and contained in the stems and roots. The rash is characterized by reddened, itchy, blistering skin that needs first aid treatment. If you believe you have contacted one of these plants, immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.

2.3.3.2 Avoidance of plant/sap contact is the only effective means of preventing the poisoning. A person experiencing symptoms of poisoning should remove contaminated clothing; wash all exposed areas thoroughly with soap and water, taking care not to touch your face or other body parts. Apply calamine or other poison ivy lotion if the rash is mild. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity. Employees will be trained in the identification of these species and will be advised to wear protective clothing such as gloves and long sleeve shirts when working conditions permit. Employees should also consider applying barrier lotions (e.g. Ivy Block) to skin that has the potential to contact these species. Clorox Wipes, Dawn liquid soap and Technu can be used to decontaminate skin and reusable clothing to prevent exposure to poison ivy. Gloves should be worn when removing and decontaminating clothing potentially exposed to poison ivy.

2.3.4 Snakes

Various reptiles, including poisonous snakes (i.e., Copperhead, Cottonmouth, Eastern Diamondback, Timber and Pigmy rattlers, and Eastern Coral) may potentially be encountered at Fort McClellan. If bitten by a snake, try to remain calm, keep the affected area below the level of the heart and walk (do not run) to the nearest support zone for assistance. The UXOSO or available personnel will immediately transport the victim to the closest medical facility for treatment, or send for appropriate medical assistance, whichever is faster. The following procedures will be implemented to avoid snakes and resulting bites:

- Wear appropriate protective equipment (work boots, snake chaps, etc.).
- Be alert and aware of your surrounding.
- Avoid walking in wooded areas, rock piles, stacks of old boards, heavy brush, or tall grass if possible.
- Never handle a “dead snake,” they may not be completely dead and can bite due to reflex action.
- If a snake is encountered, do not attempt to catch or kill it. This is a major safety violation and grounds for dismissal from the site.

2.3.5 Ticks

Both Lyme Disease and Rocky Mountain Spotted Fever (RMSF) are caused by bites from infected ticks that are common in and near wooded areas, tall grass, and brush. Ticks are small, ranging from the size of a comma up to about one-quarter inch. When embedded into the skin, they may resemble a small freckle. Tick season extends from spring through summer, but may extend year-round in areas without significant cold weather.

2.3.5.1 Lyme Disease

Lyme disease is caused by infection from a deer and lone star ticks that carries a spirochete. Deer ticks range in size from approximately one-eighth inch to one-quarter inch and can be black or brick red in color. Lone star ticks are larger and chestnut brown in color. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibodies has been successful in preventing more serious symptoms from developing. The effects of the disease vary from person to person, which often makes it difficult to diagnose. Typically, the incubation period ranges from two days to two weeks. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis.

2.3.5.1.1 Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash usually develops around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash. Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

2.3.5.1.2 Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis. Lyme disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

2.3.5.2 Rocky Mountain Spotted Fever

RMSF is an infection caused by rickettsia bacteria carried by the dog tick in the eastern United States and by the wood tick in the Rocky Mountain states. The lone star tick is also, though rarely, a carrier in the West. The signs and symptoms of RMSF may follow within 1-14 days of a tick bite. But in many cases, someone who develops the infection does not remember being bitten by a tick. Symptoms of RMSF usually begin suddenly. There is a high fever, often 103 ºF (39 ºC) to 105 ºF (40 ºC); chills; muscle aches; and a severe headache that may center around the forehead area. Eyes may become red, muscles may be tender to the touch, and there may be generalized body swelling.

2.3.5.2.1 The rash may begin anytime between 1-10 days after the fever and headache start, but it most often appears on the third to fifth day. The rash looks like small red spots or blotches that begin on the wrists, ankles, palms and soles. It spreads up the arms and legs toward the trunk, but often spares the face. As the infection progresses, the original red spots may change in appearance to look more like bruises or bloody patches under the skin. Rarely, RMSF may cause either mild symptoms or no symptoms at all. Usually it causes a moderate to severe illness that can damage the liver, kidneys, and lungs.

2.3.5.3 Prevention

Control measures to prevent contracting Lyme Disease and RMSF include:

- Avoid dense or high brush, when possible.
- Wear light colored clothing.
- Spray DEET on your skin and Permethrin on clothing and work boots.
- Tuck pant legs into socks and shirts into gloves, if possible.
- Self/Buddy check of neck, hairline, groin, and body after working in areas that may contain deer ticks. Shower immediately after returning home from the job site.

If a tick is found biting an individual, the ESS will be contacted immediately. The tick can be removed by grasping the tick with tweezers as close to the skin as possible, and pulling gently or using a tick removal system (e.g., Pro-Tick, www.scs-mall.com/store/). The affected area should then be disinfected with alcohol or similar antiseptic. If personnel feel sick or have signs similar to those above, they will notify the ESS immediately. Additionally, employees finding engorged ticks on their body will be given a medical examination.

2.3.6 Wild Animals

During site operations, wild animals such as deer, bear and coyotes may be encountered. Employees will use discretion and avoid all contact with wild animals. If these animals present a problem, efforts will be made to remove these animals from the site by consulting the PESM and OE Safety Specialist to identify appropriate measures.

2.4 ACTIVITY HAZARD ANALYSIS

Activity Hazard Analyses (AHAs) have been performed for all major elements of the Fort McClellan Work. A matrix showing the results of this analysis is contained in Attachment 1 of the APP. If new tasks are added to the scope of work, an AHA will be conducted to ensure that potential hazards are identified and mitigating measures are implemented. The AHAs will be used to instruct crews on the hazards of the associated activities during a safety (phase) preparatory meeting prior to the beginning of field work.

2.5 TRAINING

Refer to Chapter 4 of the APP for a discussion of training requirements.

2.6 PERSONAL PROTECTIVE EQUIPMENT

Refer to Chapter 9 of the APP for a discussion of personal protective equipment.

2.7 MEDICAL SURVEILLANCE

Refer to Chapter 8 of the APP for a discussion of medical surveillance requirements.

2.8 EXPOSURE MONITORING AND AIR SAMPLING PROGRAM

Exposure monitoring and air monitoring procedures are discussed in the Lead Compliance Plan (Attachement 5).

3.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

3.1 GENERAL SAFETY

Field personnel must be able to recognize and understand potential hazards associated with the operations they will be performing. Personnel active in site operations must be thoroughly familiar with the programs, practices, and procedures outlined in the APP and this SSHP. The following are considered standard safe work practices for this project:

- Eating, drinking, chewing tobacco, smoking, and carrying matches or lighters are prohibited in a contaminated or potentially contaminated area or where the possibility for contamination transfer exists.
- Avoid contact with potentially contaminated substances or materials. Avoid, whenever possible, kneeling or sitting on the ground. Do not place monitoring equipment on potentially contaminated surfaces.
- All field members should be alert to all potentially dangerous situations e.g., presence of strong, irritating, unusual, or nauseating odors.
- Personnel will be familiar with:
  - The potential harmful chemicals;
  - Terrain;
  - Location of work zones;
  - Location of emergency equipment; and
  - Designated PPE and clothing for work assignment.
- Protective equipment as specified in this SSHP will be used by all workers.
- Workers should stay clear of the heavy equipment when it is in operation.
- Wearing personal protective equipment can result in an impairment of the ability to operate site equipment. All field personnel should pay specific attention to decreased performance capabilities resulting from the use of personal protective equipment, such as poor tactile skills when wearing certain types of gloves. Prior knowledge of limitations imposed by the use of such equipment will allow the worker to assess the decrease in his or her capability to perform field operations in a safe manner.
- Wearing of jewelry, such as rings and loose bracelets and necklaces, is prohibited for personnel operating mechanized or electrical field equipment in order to avoid their entanglement in or interference with such machinery or equipment.
- Overhead power lines or buried cables pose a danger of shock or electrocution if workers contact or sever them during operations. The location of these potential hazards should be ascertained before beginning site activities.
- Buddy system procedures will be enforced during site operations.
- Site personnel will perform only those tasks that they are qualified to perform.

- Site visitors are to be escorted by qualified personnel at all times.
- Running and horseplay are prohibited in all areas of the site.
- The number of personnel in the exclusion zone (EZ) will be the minimum number necessary to perform the task in a safe and efficient manner.

3.2 FORBIDDEN PRACTICES

The forbidden practices listed below are applicable to all work sites. In addition, no person may engage in any activity for which the consequences of these actions are unclear without the approval of the UXOSO. If such activities become necessary to complete any phase of the work, the necessary safety and health requirements will be prepared by the UXOSO as an addition to the SSHP. The following practices are strictly forbidden during any work in restricted access areas:

- Horseplay.
- Fighting.
- Eating.
- Drinking.
- Smoking.
- Chewing gum, tobacco, or any other substances.
- Climbing on or over obstacles.
- Starting or maintaining an open flame of any type unless authorized by the UXOSO.
- Entering the work site, under any circumstances, without prior approval.
- Working while under the influence of intoxicants, narcotics, or controlled substances.

3.3 SITE CONTROL MEASURES

3.3.1 Communication

Routine site communications will take place face-to-face and/or via two-way radios. Each team will be supplied with portable radios for communication with the SUXOS, UXOSO and other site personnel.

3.3.1.1 Telephones

Cellular telephones will be used in emergencies. Fort McClellan is a remote location and no landline telephone service is available. UXO Teams and other site personnel will receive an emergency contact list and these lists will be available in all site vehicles.

3.3.1.2 Air Horns

These will be maintained in the SZ and in the field vehicles for initiation of emergency evacuation procedures. Emergency evacuation will be communicated with three blows on an air horn or vehicle horn.

3.3.1.3 Hand Signals

Downrange field teams will employ hand signals along with utilizing the buddy system. Hand signals are also very important when working with heavy equipment. The entire field team will know them before operations commence and their use will be covered during site-specific training. Typical hand signs are included in Table 3-1.

Table 3-1. Hand Signals

Signal	Meaning
Hand gripping throat.	Out of air, can't breathe.
Grip on a partner's wrist, placement of both hands around a partner's wrist, or four fingers raised to rally point.	Leave the area immediately, no debate. Evacuate to rally point.
Hands on top of head.	Need assistance.
Thumbs up.	Okay, I'm all right. I understand.
Thumbs down.	No, negative.
Raised Fist Clenched	Stop operation.
Hand Slashing Across Throat	Shut down equipment.

3.3.2 Personal Hygiene and Decontamination

All field activities will be performed in Level D. Personal decontamination will only be required after performing sampling activities. Personal decontamination will consist of good hygiene practices as follows:

- Wash face and hands before leaving the site, eating food, smoking, or placing chewing tobacco or gum in the mouth.
- Wash hands before and after using the restroom.
- Hand wipes will be made available if washroom facilities are not available.

3.3.3 Equipment Decontamination

Equipment decontamination will not be required in those areas that do not contain lead levels below the industrial SSSL. Heavy machinery will be dry deconned with brushes to the extent practical in those areas that have lead contamination above the industrial SSSL.

3.3.4 Site Control Zones

Site zones are intended to control the spread of potential contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. A two - zone approach will be utilized. It will include an Exclusion Zone and a Support Zone. Specific zones will be established on the work site as the various operations begin.

3.3.4.1 Support Zone (SZ)

The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides a safe area for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Safety equipment to include emergency eyewash, fire extinguishers, first aid kits, air horns and other appropriate equipment will be located in the SZ and transported to work locales as necessary. The majority of site operations will be controlled from this location, as well as site access for authorized persons. The support facility can be used as a potential evacuation point.

3.3.4.2 Exclusion Zone (EZ)

All areas where activities are performed that may involve exposure to site contaminants (ordnance) should be considered EZs. EZs will be established and taken down as MEC work in various areas is conducted and completed. The size and configuration of the EZ will be based on the withdrawal distances presented in the approved explosive safety submission (ESS) for the site, allowing adequate space for field members and emergency equipment. The size of the EZ will be determined by the site SUXOS and checked by the UXOSO. Each EZ established will be clearly delineated using traffic cones, caution tapes or other appropriate markers or barricades.

3.3.5 Emergency Response

Emergency response is discussed in detail in Paragraph 10.2 of the APP.

4.0 LOGS, REPORTS AND RECORD KEEPING

4.1 FIELD CHANGE REQUEST

Field change requests are to be completed for initiating a change to the SSHP. The PESM and Program Manager or designee approval is required. The original will be kept in the project file. Approved changes will be reviewed with affected field personnel at a safety briefing. The FCR will be provided to the COR for approval.

4.2 MEDICAL AND TRAINING RECORDS

Copies or verification documents for site-specific training and medical work status reports will be maintained on site. All employee medical records will be maintained by the Corporate Medical Consultant in accordance with TtEC Health and Safety Program, EHS 1-8. All personal exposure and medical monitoring records shall be maintained in accordance with applicable OSHA standards, CFR 1904, 1910, and 1926.

4.3 ON-SITE LOG

A log of personnel on site each day will be kept by the SUXOS or designee and personnel will sign in/out of the EZ daily.

4.4 INSPECTION RECORDS

Weekly and monthly health and safety inspections will be performed in accordance with the provisions in Chapter 5.0 of the APP. Daily vehicle inspections, receipt inspections on heavy equipment and daily heavy equipment inspections are also required. Records for these inspections will be available on site. Inspection and function testing of field equipment will be conducted daily (or before use) and will be documented in the field log books.

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5.0 VERIFICATION OF FIELD PERSONNEL REVIEW

The form below serves as verification that field personnel, subcontractors and site visitors have read, or have been informed of, and understand the provisions of the APP and SSHP. The form will be maintained on site as a project record. Personnel and visitors will sign this form after their initial site safety briefing is completed and before being permitted to work on, or visit, the site.

I have read, or have been informed of, the Site Specific Health and Safety Plan for the Fort McClellan and understand the information presented. I will comply with the provisions contained therein.	
Name (Print and Sign)	***Date***

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ATTACHMENT 3
HOSPITAL, CLINIC AND WORK CARE FACILITY
ROUTE MAP & DRIVING DIRECTIONS

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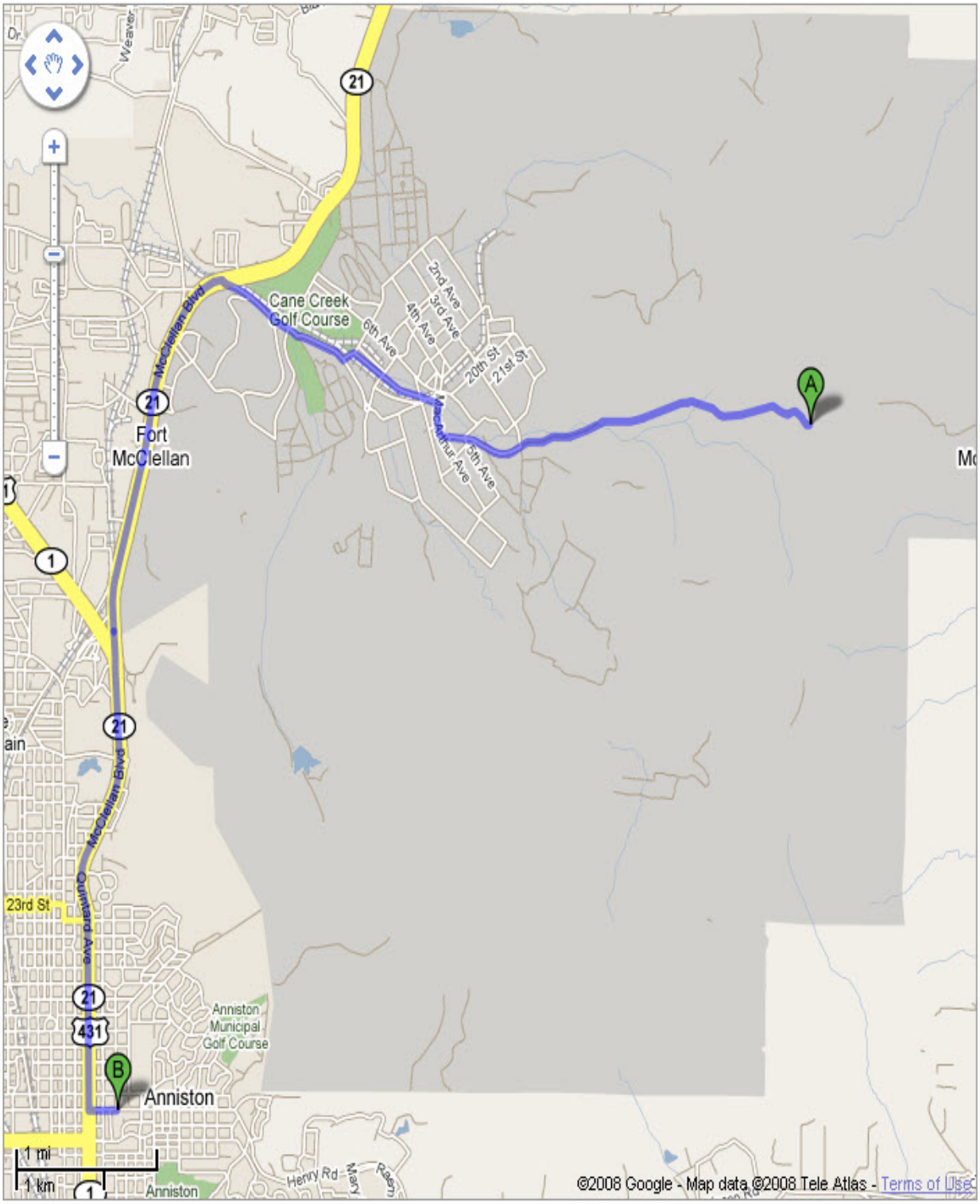
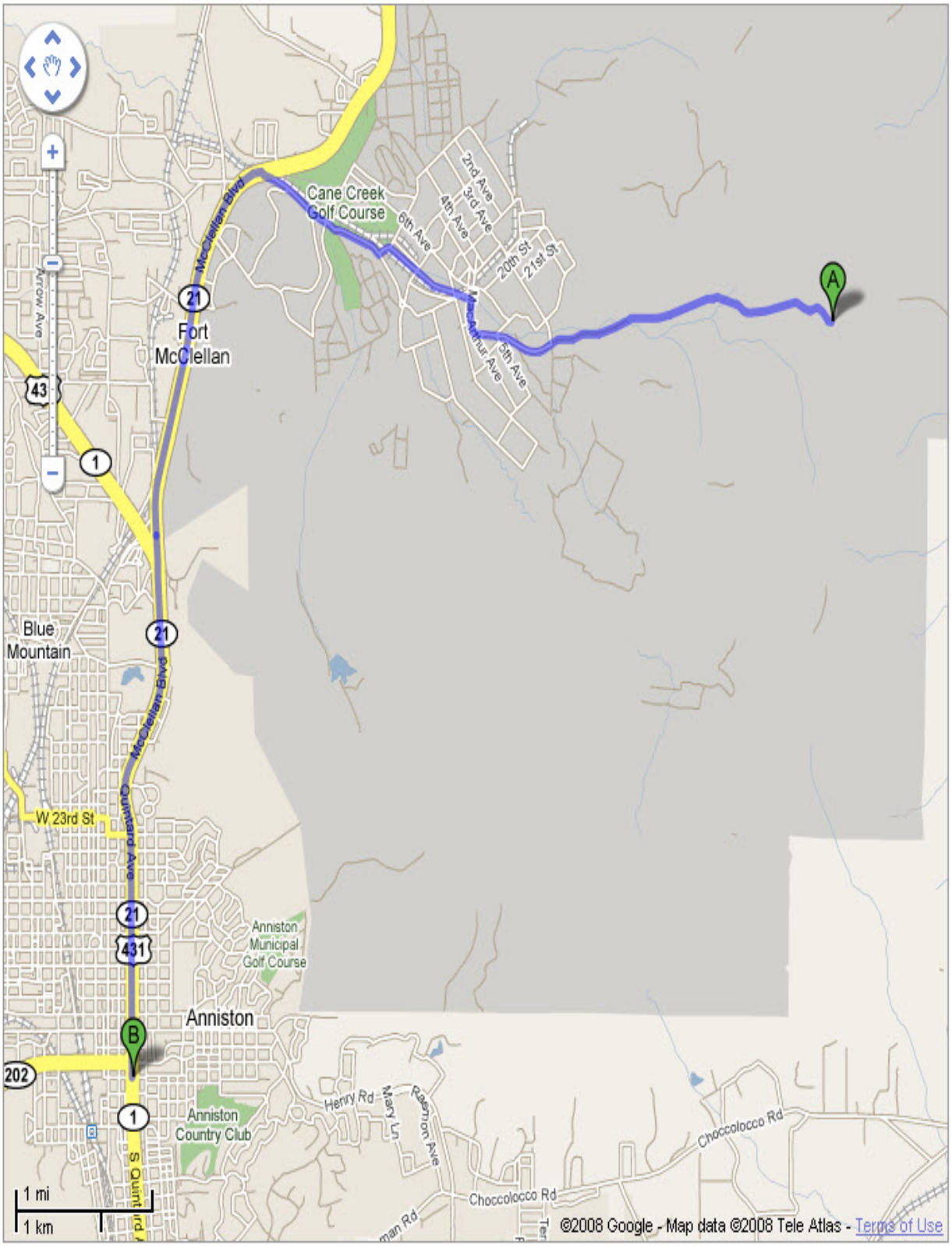


Note: TtEC will drive the hospital route prior to beginning field work and locate the specific entrance to the Regional Medical Center. Following this action, the teams will be briefed with this acquired information.

HOSPITAL
Regional Medical Center
400 E. 10th Street
Anniston, AL 36202
256-235-5121 or 911

1. **Head west on Bains Gap Rd toward Fort McCellan – 1.5 mi**
2. **Continue on 22nd St – 1.1 mi**
3. **Slight left at 21st St – 0.2 mi**
4. **Turn right at MacArthur Ave – 0.2 mi**
5. **Turn left at 7th Ave – 0.7 mi**
6. **Turn left at Fort McCellan - 459 ft**
7. **Turn right at Baltzell Gate Rd - 1.0 mi**
8. **Turn left at AL-21/McClellan Blvd - 5.1 mi**
9. **Turn left at E 10th St - 0.2 mi**

Work Care Map



WORK CARE FACILITY

Southern Family Practice and Occupational Medicine

700 Quintard Avenue

Anniston, AL 36201

256-236-9400

1. **Head west on Bains Gap Rd toward Fort McCellan – 1.5 mi**
2. **Continue on 22nd St – 1.1 mi**
3. **Slight left at 21st St – 0.2 mi**
4. **Turn right at MacArthur Ave – 0.2 mi**
5. **Turn left at 7th Ave – 0.7 mi**
6. **Turn left at Fort McCellan – 459 ft**
7. **Turn right at Baltzell Gate Rd - 1.0 mi**
8. **Turn left at AL-21/McClellan Blvd - 5.4 mi**

ATTACHMENT 4
TtEC Zip Bulletin Issue Number 108
"Improving Injured Worker Case Management"

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TETRA TECH EC, INC.

ZIP BULLETIN

Issue No: 108 Improving Injured Worker Case Management

Preventing injuries is always our first priority. However, when an injury does occur, we have found that the overall severity of the injury and the amount of OSHA recordkeeping required for the injury can be greatly reduced when we implement effective case management. Injury cases are managed effectively when we consider them "life cycle" responses:

1. We are properly prepared prior to the injury to effectively respond
2. We notify and involve the right people from the moment the injury occurs. This always includes notifying our primary medical provider, WorkCare at 800-455-6155 (available 24 hrs).
3. We continue to monitor the case throughout the diagnostic and treatment process until the injured worker returns to duty or leaves the company.

This ZIP bulletin provides steps that should be taken to improve case management. All sites are asked to review the following information with their personnel, complete the *italicized* sections for their project, and post this ZIP bulletin in conspicuous locations. Applicable information from the ZIP bulletin should be included in future changes to existing plans. Future projects should include this information in applicable Health and Safety Plans, including Incident Prevention Plans.

What Actions Should We Take Before Field Work Begins?

- Contact WorkCare at the 800-455-6155, let them know you are with TtEC, and obtain the name, address, and phone number for a local WorkCare-approved clinic.
- Enter this information in to the project Health and Safety Plan.
- Post all emergency phone numbers with the route/map to hospital/clinic in vehicles and in trailers.
- Ensure that all site employees are aware of the emergency phone number listing, how to make the call, and the location of the route maps. Reinforce this message during safety briefings.
- Hold and critique site emergency notification and response drills.
- Establish a personal relationship with local clinic/hospital/local emergency response organizations by calling them and visiting their location. WorkCare recommends the following:
  Prior to working, make a site visit to the clinic and discuss treatment options with the physician. A discussion with the doctor would include mention of TtEC's desire to take advantage of all potential first aid opportunities, rather than a recordable medical treatment. Mention to the physician that there is little difference between Motrin 800 or an over the counter pain medication. If the physician would keep that in mind when evaluating the injury that you would really appreciate it. Of course the Supervisor/Manager needs to reassure the physician that the physician is the one making the decisions, and is not meant to be an absolute directive.

  WorkCare is developing an introduction letter that can be provided to physicians that will help in these communications.
- "Map" the route to the clinic and hospital by driving the route as part of site mobilization.

What Do I Do in an Emergency Situation?

- Call 911 or your local emergency responder for initial employee evaluation and transport to the hospital. **A designated TtEC employee should always accompany the injured worker to the hospital.**
- Administer first aid to minimize the injury effects
- Call WorkCare at 800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Please mention as soon as possible that the call is regarding an emergency injury. At this point, the Occupational Health Nurse/physician will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare:
  - Name of supervisor calling
  - Phone number
  - Location calling from
  - Name of individual injured, social security number
  - Date and type of injury
- During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. **Do not delay treatment while awaiting a return phone call.**
- Call your PESM (*fill in his/her name and phone number*)
- Call your Project Manager (*fill in his/her name and phone number*)
- Call your Program Manager (*fill in his/her name and phone number*)

What Do I Do in a Non-Emergency Situation?

- Administer first aid as soon as possible to minimize the injury effects
- Call WorkCare at 800-455-6155 for a triage call/discussion with an Occupational Health Nurse or physician. Please mention as soon as possible that the call is regarding an injury. At this point, the Occupational Health Nurse/physician will assist the supervisor to determine the best treatment plan.
- Provide the following information to WorkCare
  - Name of supervisor calling
  - Phone number
  - Location calling from
  - Name of individual injured, social security number
  - Date and type of injury
- During WorkCare off-hours, dial the 800 number and identify yourself. A WorkCare health care representative will call you back shortly. **Do not delay treatment while awaiting a return phone call.**
- Call your PESM (*fill in his/her name and phone number*)
- Call your Project Manager (*fill in his/her name and phone number*)
- Call your Program Manager (*fill in his/her name and phone number*)
- Call your local Workcare clinic (fill in their phone number) to notify them that you are bringing an injured worker to their clinic for evaluation.
- You may transport the injured employee to the local clinic in a privately owned vehicle. **A designated TtEC employee must accompany the injured worker to the local clinic.**
- Encourage the clinic, with WorkCare support, to consider first aid measures first.

What is Considered an Emergency?

When deciding which of the two medical facilities (discussed above) to use for medical treatment, draw upon your first aid training/handbooks, past experience, or advice from a PESM or from a licensed health care professional; using your best judgment may prove most valuable.

Some physical signs/symptoms that require emergency medical treatment and a call to 911/ambulance service is provided.

- Chest pain
- Difficulty breathing
- Uncontrolled bleeding
- Bone fracture
- Loss of consciousness
- Severe head injury
- Poisoning
- Shock
- Loss of limb
- Sudden and prolonged dizziness

What Actions Do I Take after an Injury?

- Obtain treatment and medical release records for the injured worker and forward to WorkCare.
- Contact TtEC worker's compensation carrier (ESIS @ 800-867-3747) within 24 hours of injury.
- Seek ways to ensure the worker can work, including alternate work. Prompt return to work is crucial for successful case management.
- Regularly follow-up with WorkCare and ESIS case representatives.

Near Miss and Quality Incident Reports are great ways to contribute to our ESQ Programs. Communicating our Lessons Learned can result in the continuous improvement necessary for achieving ZERO INCIDENT PERFORMANCE™ and Client Service Quality and generating Very Satisfied Clients!

"Working Toward Zero Incident Performance Through Planning, Tasking, and Error-Free Execution"

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ATTACHMENT 5
Lead Compliance Plan

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LEAD COMPLIANCE PLAN

1.0 PURPOSE

This document was prepared to meet the applicable and appropriate requirements of USACE Engineering Manual (EM) 385-1-1, Section 06.B.05 and OSHA 1926.62 in a level of detail commensurate with the nature of the work to be performed during the demolition of the Tire House and the clearance activities performed in the areas with lead contamination that exceeds the Industrial site-specific screening level (SSSL) for lead (i.e, 880 mg/kg). The SSSL were developed for human health and ecological risk evaluations as part of the ongoing site investigations performed under the BRAC Environmental Restoration Program at Fort McClellan (IT, 2000).Historically speaking, OSHA recognized the need to promulgate a standard to protect workers who were potentially exposed to lead in construction-type activities. While encompassing seven distinct lead activities, the standard's impetus was based primarily on protecting workers who perform lead-based paint removal/abatement (e.g., residential) and those who replace structural steel (e.g., bridges) that was previously painted with lead-based paint.

2.0 SCOPE

TtEC recognizes that the scope of the work at the tire house is not a lead abatement as envisioned by OSHA. The principle action associated with the tire house scope of work is to remove the sand and tires, certify it is free of MPPEH and dispose of the materials. The tire house is known to contain bullet lead from previous activities. No sample results have been collected of the material and therefore the extent of contamination within the sand is unknown. Samples will be collected prior to demolition activities. These results will be reviewed by the PESM and he will determine if the proposed procedures in the Lead Compliance Plan are appropriate. In addition, the areas designated for MEC clearance have been identified to have lead contamination in some portions that exceed the industrial SSSLs as well as the recreational site user SSSLs.

This lead compliance plan has been developed to describe the procedures to be followed during the clearance activities as well as the demolition of the tire house to protect workers from lead hazards. The following paragraphs follow the format prescribed in Section 06.B.05 of EM 385-1-1, specifically items b1 through b11.

3.0 DESCRIPTION OF EACH WORK ACTIVITY IN WHICH LEAD MAY BE EMITTED

A potential for worker exposure to lead exists during MEC clearance activities in portions of the Charlie Area as well as demolition of the Tire House. Procedures to minimize the potential for lead exposure during clearance activities have been developed based upon the type of activity being performed. The procedures to address potential lead exposures during demolition of the Tire House have been will be upgraded or downgraded based upon the sample results.

3.1.1 Non-Intrusive Clearance Activities

Except for subsurface clearance, the majority of the MEC clearance activities (e.g., surface clearance, geophysical investigation, and reacquire) are non-intrusive. The only potential contact with lead contaminated material would be from walking and picking up items within the areas

having lead contamination. Primary routes of exposure would be through skin contact, cross contamination, and ingestion. Since minimal to no airbourne dust is expected to be generated, inhalation is not a likely potential exposure route. Due to the nature of the non-intrusive activities, only those grids with lead levels that exceed the SSSL for the recreational site user (i.e., 7600 mg/kg) will require additional PPE not specified in the APP (see Table 3-1) when performing these activities.

3.1.2 Intrusive Clearance Activities

Subsurface clearance activities are the only intrusive activities anticipated to be performed during MEC clearance activities. Primary routes of exposure would be through skin contact, cross contamination, and ingestion. Since minimal to no airbourne dust is expected to be generated, inhalation is not a likely potential exposure route. Because UXO technicians will be excavating anomalies targeted in the geophysical investigation by hand or with heavy equipment, there is a high exposure potential for skin contact and ingestion. As a result, those grids with lead levels that exceed the SSSL for the industrial worker (i.e., 880 mg/kg) will require additional PPE not specified in the APP (see Table 3-1) when performing these activities.

3.1.3 Demolition of Tire House

Prior to beginning removal of the tire house, samples from the soil within the tires will be collected and analyzed for lead to determine if the lead level in the soil is above or below regulatory limits. In addition, signs will be posted warning of potential lead contamination. TtEC will use heavy equipment to collapse the tire house by pushing the tires towards the center of the facility in order to minimize the area impacted by the potential lead-contaminated material. UXO Technicians will segregate the tires from the soil at the same time inspecting them for MEC prior to placement in rolloff containers. Once the tires are separated, the technicians will inspect the soil for MEC after which it will be placed in separate lined rolloffs. The tires will be transported off site by an approved vendor for recycling.

PPE shall be consistent with the requirements described in the WP, APP and SSHP. Engineering controls to reduce exposure to less than the permissible exposure limit (PEL) include dust control measures, enclosed heavy equipment cabs with air conditioning where possible and the use of PPE (i.e., Tyvek, gloves, overboots, and CBRN respirator as applicable). Administrative controls include awareness training, air and biological monitoring of workers, increasing worker distance to the source of lead, and minimizing workforce size within source areas as appropriate or whenever possible. Based on experience and training, Richard Rogaliner (TtEC UXOSO) will be the designated Competent Person to ensure compliance with the lead requirements.

3.2 MEANS TO BE USED TO ACHIEVE EXPOSURE COMPLIANCE

See Section 3.1.1 through 3.1.3 above.

Table 3-1
Personal Protective Equipment Selection

Task	Head	Eye/Face	Feet	Hands	Body	Hearing	Respirator
Standard PPE Requirements	HH if overhead hazard	SG	STB or CTB	LWG	Work Clothes	EP as needed around power tools and heavy equipment	No Respiratory Protection Required.
Non-intrusive activities in areas that exceed the SSSL for the recreational site user (i.e., 7600 mg/kg)	HH if overhead hazard	SG	STB or CTB with tyvek booties or overboots	LWG	Work Clothes	EP as needed around power tools and heavy equipment	No Respiratory Protection Required.
Intrusive activities in areas that exceed the industrial SSSL (i.e., 880 mg/kg)	HH if overhead hazard	SG	STB or CTB with tyvek booties or overboots	LWG	Work Clothes with Tyvek coveralls	EP as needed around power tools and heavy equipment	No Respiratory Protection Required.
Demolition of Tire House (Sample Results below industrial SSSL)	HH if overhead hazard	SG	STB or CTB	LWG	Work Clothes	EP as needed around power tools and heavy equipment	No Respiratory Protection Required.
Demolition of Tire House (Sample Results above industrial SSSL)	HH if overhead hazard	SG	STB or CTB with tyvek booties or overboots	LWG	Work Clothes with Tyvek coveralls	EP as needed around power tools and heavy equipment	Based on Air Monitoring Results.

Notes: CTB – Composite Toe Boots
EP – Ear Plugs
HH – Hard Hat
LWG – Leather Work Gloves
PFD – Personal Flotation Device
PFS – Plastic Face Shield
SG – Safety Glasses
STB – Safety Toed Boots

3.3 WORKER EXPOSURE ASSESSMENT PROCEDURES

Real-time air monitoring will be performed to document exposures to lead during demolition of the tire house. Inhalation of dust is not an anticipated route of exposure during the intrusive and non-intrusive MEC Clearance activities so air monitoring will not be performed during these activities. If real-time respirable dust monitoring levels exceed the action levels identified in Table 3-2, PPE will be upgraded to Level C (i.e., Tyvek, gloves, overboots, and full-face HEPA respirator as applicable).

3.4 PROTECTIVE CLOTHING, HOUSEKEEPING, AND HYGIENE FACILITIES

PPE requirements are provided in Table 3-1. The use of PPE during the tire house demolition shall be in accordance with the air monitoring and PPE selection based on the sample results. Dry sweeping or the use of compressed air shall not be used in areas potentially contaminated with lead. Containers used for disposal of lead shall be labeled: **Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking.** Hygiene practices to prevent the inadvertent ingestion of lead include:

- No eating, drinking, gum chewing, or smoking in the exclusion zone;
- All workers will wash hands before eating or drinking;
- Hand to mouth contact shall be avoided.

Localized dry decontamination (decon) stations will be setup to reduce the potential spread of lead from contaminated to non-contaminated areas. Disposable coveralls and gloves will be placed in plastic trash bags at the end of each day and held within the lead contaminated areas until they are discarded with solid waste or with the hazardous soil as appropriate. Rubber overboots may be reworn for multiple shifts if they are not damaged. A portable sink will be provided for hygiene purposes (not decon).

Disposable wipes specifically made for respirators will be used by each worker to clean their respirator daily. An increase in breathing resistance will be used to determine cartridge change out for the respirator filters (note, OSHA requires that a cartridge change out schedule be developed only for gases and vapors). CBRN cartridges will be replaced after every use only where CBRN protection was necessary. Cleaned respirators will be placed in plastic bags at the end of each shift. If the lead soil sample results indicate the soil is hazardous, the heavy machinery will be dry deconned with brushes to the extent practical.

3.5 MEDICAL SURVEILLANCE PROCEDURES

The medical surveillance program requirements found in OSHA 1926.62(j) provide the basis of the medical monitoring that will be performed at this site. Workers participating in the tire house demolition and MEC clearance activities in those areas that exceed the industrial SSSL (i.e., 880 mg/kg) will be subject to baseline blood lead analysis and will be subjected to exit blood lead analysis during demobilization (prior to taking an assignment elsewhere). Additional biological testing may be performed on workers pending TtEC CIH review of air and biological monitoring results. Each employee underwent an annual physical under the medical surveillance program to ensure fitness for wearing respiratory protection.

3.6 COMPETENT PERSON AND WORKER TRAINING

Lead awareness training shall be developed by the TtEC CIH in accordance with OSHA 1926.62 (l) and presented to workers by the TtEC UXOSO with consultation from the TtEC CIH. The training will assure workers understand the significance of the lead hazards and how to protect themselves. Workers will also be instructed on the correct procedures of donning and doffing PPE. The competent person will perform regular inspections of the job site and materials IAW the requirements of USACE and 1926.62(e)(2)(iii).

3.7 LOCATION OF LEAD HAZARD CONTROL AREAS

Locations within the MEC clearance areas contain lead contamination exceeding the industrial SSSL. In addition, the tire house is known to contain bullet lead, samples will be collected from within the tires and analyzed prior to performing any demolition activities to determine the concentrations of lead in the sand/gravel. This area will be fenced prior to beginning any demolition activities.

3.8 PERIMETER AIR MONITORING

Based on the low levels of lead anticipated, perimeter air monitoring will not be performed.

3.9 SECURITY

Temporary fencing will be erected around the tire house and signs will be posted warning of potential lead contamination. No additional security measures in the MEC Clearance Areas other than those already in place are required. Security in lead areas shall be controlled by instituting traditional HAZWOPER work zones.

3.10 WASTE GENERATION, CHARACTERIZATION, TRANSPORTATION, AND DISPOSAL

The only waste generated during the MEC clearance activities will likely be scrap metal once the items found are demilitarized. Lead contaminated soils will not be removed during the MEC Clearance activities. The only waste characterization sampling will be performed for the tire house. Waste characterization samples will be collected prior to beginning the demolition of the tire house. One soil sample will be collected for every 100 cubic yards of soil and analyzed for TCLP lead by GPL Laboratories located in Gaithersburg, Maryland. TtEC will use heavy equipment to collapse the tire house by pushing the tires towards the center of the facility in order to minimize the area impacted by the potential lead-contaminated material. As discussed in Section 3.1.1, the tires and soil will be segregated and inspected for MEC prior to being placed into rolloff containers. The tires will be transported off site by an ADEM approved vendor for recycling. If results indicate TCLP lead levels are below regulatory limits, the soil may be redistributed at the tire house site and the associated PPE will be discarded as solid waste. If the TCLP results indicate the material is non-hazardous, it will be transported by Waste Management for disposal at their Three Corners Facility located in Gadsden, Alabama. If determined to be hazardous, the soil will be transported to Waste Management's Emelle, Alabama facility for stabilization and disposal. Hazardous waste profiles and manifests will be prepared to accompany the off-site shipment(s), reviewed by TtEC, and will be submitted to USAESCH for their review and approval. USAESCH will sign all manifests.

3.11 AIR MONITORING

The following sections contain information describing the types, frequency and location of real time air monitoring to evaluate potential worker exposures.

3.11.1 Instrumentation

The following monitoring instruments will be available for use during remediation operations as necessary:

- Dust Meter, MiniRAM or equivalent, aerosol dust monitor.

The dust meter will be used to assess the respirable dust concentrations in the worker breathing zone during demolition of the tire house and sand/gravel handling activities associated with the tire house demolition.

3.11.2 Real-Time Air Monitoring

Dust Monitoring will be performed by the UXOSO during activities that will likely generate dust (i.e., handling lead contaminated materials (i.e., sand/gravel) during the demolition of the tire house). Intrusive and non-intrusive MEC Clearance activities are not anticipated to generate dust. A calibrated aerosol dust monitor will be used to monitor dust levels in personnel breathing zones. A background reading must be obtained from a clean area prior to taking readings

Table 3-2 presents a breakdown of each main activity and provides the instrumentation, frequency, and location of the real time monitoring for the site.

3.11.3 Data Quality Assurance

3.11.3.1 Calibration

Monitoring instrument calibration will be documented and included in a dedicated safety and health log book or on separate calibration pages. The dust meter must be calibrated before and after each shift's use. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

Table 3-3-2
Real Time Air Monitoring Action Levels

Activity	Air Monitoring Instrument	Frequency and Location	Action Level (AL)	Site Action	Reason
Background Readings	MiniRAM or equivalent	A minimum of twice per day when tasks covered by this plan are performed (e.g., at the beginning and end of work activities); taken upwind and down wind from the site of activity, at the area of activity, and in the worker breathing zone.	< 2.5 mg/m^3 for five minutes.	No respiratory protection is necessary. Continue work.	Based on the sample results and TLV for lead.
Activities which may generate lead contaminated dust (i.e., handling lead contaminated materials during demolition of the tire house) MEC Areas	MiniRAM or equivalent	In the breathing zone, initially at a minimum, every 30 min. The frequency may decrease to every 1 hour if results are consistent after the first week of operations.	> 1.65 mg/m^3	If readings are measured above the action level, take an additional reading and document the measurement. Continue to take readings for five minutes. Document the measurement every 15 minutes. If readings stay above the action level, use dust suppression techniques or revaluate work practices to minimize dust generation or upgrade respiratory protection to Level C full-face HEPA respirators	Based on the sample results of 7600 mg/kg and PEL for lead (see Table 3-3)

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Table 3-3-3
Dust Exposure Calculation Worksheet

South Bay III Safety Factor for this site = 4

Chemical	Exposure Limit (mg/m3)	Maximum Soil Concentration (mg/kg)	Exposure Limit Based on Single Compound (EL Mix, mg/m3)	Dust Quotient for Each Compound (level/limit)	Problem from Single Compound [5mg/m3)/ELmix]
Aluminum	5	1.E-9	1.25E+15	2.00E-10	0.000
Antimony	0.5	1.E-9	1.25E+14	2.00E-09	0.000
Arsenic	0.01	1.E-9	2.5E+12	1.00E-07	0.000
Barium	0.5	1.E-9	1.25E+14	2.00E-09	0.000
Beryllium	0.002	1.E-9	5.E+11	5.00E-07	0.000
Cadmium	0.005	1.E-9	1.25E+12	2.00E-07	0.000
Chlordane	1	1.E-9	2.5E+14	1.00E-09	0.000
Chromium	0.5	1.E-9	1.25E+14	2.00E-09	0.000
Chrome (hex)	0.01	1.E-9	2.5E+12	1.00E-07	0.000
Cobalt	0.02	1.E-9	5.E+12	5.00E-08	0.000
Copper	1	1.E-9	2.5E+14	1.00E-09	0.000
Cyanides	5	1.E-9	1.25E+15	2.00E-10	0.000
Endosulfan	0.1	1.E-9	2.5E+13	1.00E-08	0.000
Fluorides	2.5	1.E-9	6.25E+14	4.00E-10	0.000
Lead	0.05	7,600	1.64	1.52E+05	3.040
Manganese	1	1.E-9	2.5E+14	1.00E-09	0.000
Mercury	0.05	1.E-9	1.25E+13	2.00E-08	0.000
Nickel	1	1.E-9	2.5E+14	1.00E-09	0.000
Oil Mist	5	1.E-9	1.25E+15	2.00E-10	0.000
PCBs	0.5	1.E-9	1.25E+14	2.00E-09	0.000
PNAs	0.2	1.E-9	5.E+13	5.00E-09	0.000
Phthalates	5	1.E-9	1.25E+15	2.00E-10	0.000
RDX	1.5	1.E-9	3.75E+14	6.67E-10	0.000
Selenium	0.2	1.E-9	5.E+13	5.00E-09	0.000
Silica	0.05	1.E-9	1.25E+13	2.00E-08	0.000
Silver	0.01	1.E-9	2.5E+12	1.00E-07	0.000
Thallium	0.1	1.E-9	2.5E+13	1.00E-08	0.000
Tin	2	1.E-9	5.E+14	5.00E-10	0.000
Titanium	10	1.E-9	2.5E+15	1.00E-10	0.000
Trinitrobenzene	0.07	1.E-9	1.75E+13	1.43E-08	0.000
Trinitrotoluene	0.5	1.E-9	1.25E+14	2.00E-09	0.000
Vanadium	0.05	1.E-9	1.25E+13	2.00E-08	0.000
Zinc	5	1.E-9	1.25E+15	2.00E-10	0.000
			Sum	**1.52E+05**	
		Dust Exposure Level at Mixture PEL =	**1.645**		**3.040**

EQUATIONS USED IN THIS CALCULATION

Dust action level = (1E+6)(Exposure Limit mg/m3)
(For one dust) _____
(Concentration mg/kg)(Safety Factor)

Dust action level = (1E+6) / (Safety Factor)
(For mixed dusts) _____
Sum of [(Concentration mg/kg) / (Exposure Limit)]

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908 / 225 - 7000

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Name of Site

Table 3-3-3
Dust Exposure Calculation Worksheet
(Continued)

Radionuclide	Airborne Limit (pCi/l)	Maximum Soil Concentration (pCi/g)	Action Level f. Single Compound (mg/m3)	Quotient for Each Compound (level/limit)	Problem from Single Compound [5mg/m3)/ELmix]
Americium-241	0.003	0.00	7.5E+11	3.33E-07	0.000
Carbon --- 14	1000	0.00	2.5E+17	1.00E-12	0.000
Cesium -- 137	60	0.00	0.0E+00	0.00E+00	0.000
Cobalt --- 60	10	0.00	0.0E+00	0.00E+00	0.000
Iodine -- 131	20	0.00	0.0E+00	0.00E+00	0.000
Lead -- 210	0.1	0.00	2.5E+13	1.00E-08	0.000
Lead -- 212	10	0.00	2.5E+15	1.00E-10	0.000
Manganese--54	300	0.00	0.0E+00	0.00E+00	0.000
Molybdenum-99	1000	0.00	2.5E+17	1.00E-12	0.000
Phosphorus-32	200	0.00	5.0E+16	5.00E-12	0.000
Plutonium-238	0.003	0.00	0.0E+00	0.00E+00	0.000
Plutonium-239	0.003	0.00	0.0E+00	0.00E+00	0.000
Polonium--210	0.3	0.00	7.5E+13	3.33E-09	0.000
Potassium--40	200	0.00	0.0E+00	0.00E+00	0.000
Radium -- 226	0.3	0.00	0.0E+00	0.00E+00	0.000
Radium -- 228	0.5	0.00	1.3E+14	2.00E-09	0.000
Sodium --- 22	300	0.00	7.5E+16	3.33E-12	0.000
Strontium- 90	8	0.00	0.0E+00	0.00E+00	0.000
Technetium-99	300	0.00	7.5E+16	3.33E-12	0.000
Tellurium-132	90	0.00	2.3E+16	1.11E-11	0.000
Thorium - 230	0.003	0.00	7.5E+11	3.33E-07	0.000
Thorium - 232	0.003	0.00	7.5E+11	3.33E-07	0.000
Tritium - H3	20000	0.00	0.0E+00	0.00E+00	0.000
Uranium - 234	0.02	0.00	5.0E+12	5.00E-08	0.000
Uranium - 235	0.02	0.00	0.0E+00	0.00E+00	0.000
Uranium - 238	0.02	0.00	0.0E+00	0.00E+00	0.000
Yttrium -- 91	300	0.00	0.0E+00	0.00E+00	0.000
Zirconium- 95	50	0.00	1.3E+16	2.00E-11	0.000
			Sum	**1.07E-06**	
	Dust Exposure Level at PEL for Mixture =			**2.3464E+11**	

3.11.3.2 Operations

All instruments will be operated in accordance with the manufacturer's specifications and the operations manual; a copy will be maintained on-site by the ESS for reference.

3.11.3.3 Data Review

The UXOSO will interpret all monitoring data based on action levels listed in Table 3-2 of this plan and his/her professional judgment. The UXOSO shall review the data with the PESM to evaluate the potential for worker exposure and upgrades/downgrades in PPE. The previous day's monitoring results will be discussed with all site personnel at the tailgate safety meeting prior to commencing work activities for that day.

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APPENDIX E
MUNITIONS CONSTITUENTS
SAMPLING & ANALYSIS PLAN

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1.0 SAMPLING AND ANALYSIS PLAN

This plan presents the sampling and analysis procedures to be followed for soil to characterize the amounts of lead found in the soil located in the tires of the tire house to determine appropriate disposal options. This plan has been prepared in accordance with DID MR-005-10.01 (Munitions Constituents Chemical Data Quality Deliverables) and EM 200-1-3. This section defines field methods and procedures that are applicable to the collection of waste characterization samples for lead. One waste characterization sample will be collected in-situ for every 100 CY of soil that will require disposal.

1.1 DEFINE THE SCALE OF DECISION MAKING

Collected samples will be analyzed for total lead and TCLP lead. Results below the TCLP Leachate Maximum for lead – 5.0 mg/L – will be considered non-hazardous and the material will be disposed at Waste Management's Three Corners Facility in Gadsden, Alabama. If the results are above the TCLP Leachate Maximum for lead, the material will be considered hazardous and will be stabilized and disposed at Waste Management's Emelle, Alabama facility. If analyses indicate lead levels are below regulatory limits (i.e., EPA Region 3 Risk Based Criteria (400 mg/kg for residential and 800 mg/kg for industrial)), USACE has indicated that the soil may be redistributed at the tire house site.

1.2 SAMPLE COLLECTION

TtEC estimates that approximately 250 CYs of soil are contained within the tires and will require disposal or redistribution. One composite waste characterization sample composed of multiple discrete samples will be collected in-situ for every 100 CY volume of soil within the tire house (3 samples total) and will be analyzed for total lead and TCLP lead. The sampling tools will be either stainless steel or disposable plastic and a small volume (e.g. approximately 4 ounces) discrete sample will be collected at multiple points within the 100 CY volume to facilitate subsequent sample processing and generation of the composite sample. Approximately 10 discrete samples, or aliquots will be collected along the walls of the tire house at varying heights and depths. The aliquots will be collected using a clean stainless steel or new disposable plastic sampling spoon, which will be stored in plastic bags between aliquots and disposed after each complete composite sample is collected. Care will be taken to ensure that each aliquot is approximately the same size and weight (e.g., 4 oz.). The initial first discrete 4 oz. soil sample comprising the composite sample will be placed in a clear plastic bag that is inside of a 5-gallon pail. The sampler will then move to the next location and repeat the process for the 100 CY volume until 10 aliquots are obtained from multiple locations and depths assessed to be representative of the 100 CY volume. The collected aliquots will be homogenized using the quartering method and a 8 oz. composite sample will be collected from the homogenized material. Each composite soil sample collected will be analyzed for total lead using SW-846 Method 6010B and TCLP lead using SW-846 Method 1311/6010B (see Table 2.1). After sampling, disposable tools will be discarded. Re-usable tools will be cleaned and decontaminated between each composite sample collection location (see section 1.4). Sample collection, preservation, packaging, documentation, and shipping will be performed by TtEC field staff. Analyses will be

performed by the subcontractor laboratory, GPL Laboratories, of Gaithersburg, Maryland.

1.3 SAMPLE IDENTIFICATION AND LABELING

The sample identification system that will be used for this project will assign a unique sample identifier to each sample collected. Data management will be consistent with this sample identification system. The protocols for assigning field sample numbers are described below. Each sample collected will have its own identifier, which will apply for the duration of the project. The sample identifier will consist of an alpha-numeric code that will identify the site designation and sample number. Note: all sample identifiers and their corresponding locations will be carefully logged in the field notebook and may be identified on figures or drawings.

1.3.0.1 A soil sample will be identified based on the location (i.e., tire house) where it was collected. For example, sample ID SH-02 indicates the second composite sample collected from the tire house. Sample labels will be completed by field personnel in indelible ink. Labels will include the project identification, sample identification, date and time of collection, sampler's initials, sample matrix, type of sample (i.e., composite), analyses to be performed, and preservative used (if applicable).

1.3.1 Sample Chain of Custody

To maintain and document sample possession, chain of custody (COC) procedures will be implemented. These procedures are necessary to insure the integrity of samples from the time of collection through data reporting. The COC protocol provides the ability to trace possession and handling of samples. A sample is considered under custody if it is:

- In a person's possession;
- In a person's view after being in possession;
- In a person's possession and locked up; or
- In a designated secure area.

1.3.1.1 Personnel collecting samples are responsible for the care and integrity of those samples until they are properly transferred or dispatched. Therefore, the number of people handling a sample will be kept to a minimum. COC records will be completed by the sampler and shall accompany the samples at all times. The following information shall be indicated on the COC record:

- Project identification;
- Signature of sampler(s);
- Sample identification, sample matrix, date and time of collection, grab or composite sample designation, number of containers corresponding to that sample identification, analyses required, remarks or sample location (if applicable), and preservation method(s);

- Signature of the individual relinquishing the samples; and
- Signature of the individual(s) receiving the samples and air bill number, if applicable.

1.3.1.2 When the samples are being shipped by an overnight delivery service to a laboratory, the individual preparing the COC will check the sample label and COC record for accuracy and completeness against the sample labels and field documentation for each sample within the shipping cooler, prior to placing the COC in a waterproof, sealable plastic bag and taping securely to the inside lid of the shipping container.

1.4 DECONTAMINATION PROCEDURES

Disposable equipment will be used to the extent practicable for soil sampling events and decontamination will not be required. If non-disposable stainless steel trowels are used, they will be decontaminated following soil processing after each 100 CY composite sample collection event by rinsing thoroughly (triple rinse) with deionized water.

1.5 ANALYTICAL METHODS, SAMPLE HANDLING, PRESERVATION, CONTAINER REQUIREMENTS AND HOLDING TIMES

For the purposes of this section, the term "sample handling" includes the field-related considerations connected with the selection of sample containers, preservative types, allowable sample holding times, and the analyses to be requested. TtEC will request 48-hour turnaround for all analyses in order to determine if the soils are acceptable for redistribution/backfill on-site or if they must be transported and disposed off-site. Table 1-1 provides requirements for sample handling protocols.

Table 1-1
Sample Containers, Preservatives, and Holding Times

SOW Analysis	Matrix	Method	Container	Preservatives	Holding Times
Total Lead	Soil	6010B	(1) 8 oz. Polyethylene	Cool to 4°C	6 months to analysis
TCLP Metals	Soil	1311/6010B	(1) 32 oz. Polyethylene	Cool to 4°C	6 months to TCLP extraction; 6 months to analysis

1.6 SAMPLE SHIPMENT

Samples for off-site laboratory analysis will be shipped via Federal Express for overnight delivery in waterproof coolers using the following procedures:

- After filling out the pertinent information on the sample label, cover the label with clear tape.
- Put the sample in the bottle or vial and screw on the lid.

- Generate a cooler temperature blank sample by filling a 40 ml VOA vial or other sample bottle with tap or deionized water. Label this container "Cooler Temperature Blank".
- Enclose all sample bottles in clear plastic bags through which sample labels are visible, and seal the bag. Chill the sample bottles to 4 ± 2°C in wet ice before wrapping in bubblepack and packing in shipping cooler.
- Place about three inches of inert cushioning material such as vermiculite or bubblepack in the bottom of the cooler.
- Place bottles upright in the cooler in such a way that they do not and will not touch during shipment.
- Put in additional inert packing material to partially cover sample bottles (more than halfway). Place bags of wet ice (double bagged) around, among, and on top of the sample bottles. Chemical ice should not be used.
- Fill cooler with additional cushioning material.
- Put paperwork (chain-of-custody record) in waterproof plastic bag and tape to the inside lid of the cooler.
- Tape the outside drain shut.
- Secure lid by taping. Wrap the cooler completely with strapping tape at a minimum of two locations.
- Attach completed shipping label to top of the cooler.
- Affix two signed and dated custody seals on opposite corners. Cover seals with wide, clear tape.
- Prior to shipping, samples will be stored on ice at 4 ± 2°C.

1.6.1 Upon receipt and opening of the sample coolers, the lab will complete a Condition of Receipt form documenting the condition of the cooler and its contents including temperature of the temperature blank. The lab will provide a copy of this form to TtEC and contact TtEC immediately if samples are broken and/or the temperature of the temperature blank is greater than 6 deg C.

1.7 QA/QC METHODS

Since samples collected are for waste characterization purposes only, field Quality Assurance/Quality Control samples (e.g., field duplicates, etc.) will not be collected.

1.8 DATA REPORTING

Detailed, bound, weatherproof field logbooks with numbered pages shall be controlled by the UXOSO/UXOQCS and maintained by each field representative to record information related to sampling or field activities. This information will be written in ink and will include the following:

- Date and time of soil sampling event;
- Climatic conditions;
- Key personnel on-site;
- Health and safety levels of protection;
- Description of field activities, including any approved work changes and/or deviations from approved project plans;
- Comments to/from Government party representatives;
- Sampling location and identification;
- Sampling sequence and time of each sample collection;
- Types of sample bottles used and sample identification numbers;
- Parameters requested for analysis;
- Field observations during sampling event, including a visual description of sample (color, odor, etc.);
- Name of sample collector(s);
- QA/QC data for field instruments;
- Any problems encountered;
- Description of all sampling equipment used, including trade names, model number, diameters, material composition, etc.; and
- Description of all instrument calibration procedures and results.

1.9 ANALYTICAL DATA REPORTING

Analytical data will be provided by the laboratory in hard-copy and electronic format (Excel spreadsheet of sample results). The laboratory reports will include, but not be limited to, the following:

- The name, address, and phone number of the analytical laboratory;
- Signature of an authorized laboratory individual indicating the acceptability of the data;
- Project name and unique ID number;
- Field sample ID number as written on the COC form and laboratory sample ID number;
- Method (and SOP) numbers for all preparation, cleanup, and analysis procedures employed;
- Preparation, analysis, and other batch numbers utilized;

- A copy of the signed COC records indicating the condition of the samples at the time of receipt at the laboratory;
- Method reporting limits adjusted for sample-specific factors (e.g., aliquot size, dilution/ concentration factors, moisture content);
- Sample results reported with the correct number of significant figures and any data qualifiers assigned by the laboratory in units of microgram or milligram per kilogram, dry weight for soils, and microgram or milligram per liter for aqueous equipment blanks;
- Sample results from all runs recorded and reported, along with dilution/concentration factors, if applicable, and all results greater than the MDL but less than the reporting limit (RL) shall be reported and qualified as estimated;
- A summary of pertinent COC and tracking information (i.e., dates of preparation and analysis, analytical instrumentation, associated analytical method QC samples, etc.);
- Quality control results, including spiking concentration and acceptable limits; and
- Copies of raw data including instrument outputs (such as chromatograms, quantitation reports, etc.), relevant logbooks, instrument injection logs and standard preparation logs.

1.9.1. Table 1-2 provides details on the detection limits. Laboratory data will be presented in the Final Report.

1.10 CONTAMINANTS OF CONCERN AND ASSOCIATED DETECTION LIMITS

Samples will be analyzed off-site for total lead using EPA Methods 6010B and TCLP lead using EPA Method 1311/6010B. Detection limits, laboratory reporting limits, and numerical DQOs are included in Tables 1-2.

Table 1-2
Total Lead Reporting Limits and Data Quality Objectives

Analyte	Analytical Method	Reporting Limits (mg/kg or mg/L in TCLP Extract) [1]	Method Detection Limits (mg/kg)[1]	Comparison Criteria for Selecting Soil Inorganic Contaminants of Concern (mg/kg)[2]	
				Residential	Industrial
Lead	6010B	1.0	0.24	400	800
TCLP Lead	1311/6010B	0.1	NA	NA	NA

[1] Reporting limits for soils may vary slightly, based on the mass digested and % moisture of the sample (i.e., reporting is on a dry weight basis).

APPENDIX F
CONTRACTOR FORMS

CONTENTS:

Intrusive Investigation Data/ MEC Accountability Form
Surface Clearance Data Form
MEC Tracking Log
Preparatory Phase Inspection Report
Initial Phase Inspection Report
Follow-Up Inspection/Surveillance Report
Daily Quality Control Report
Non-Conformance Report
Root Cause Analysis
Field Change Request (FCR) Form
Seeding Checklist/ Log
Daily Instrument Prove-Out Report
Stop Work Request (SWR)
Stop Work Request Log
Operator Proficiency Test Report
Operator Test Plot Setup Report
Individual Operator Proficiency Test Sheet
Equipment Maintenance/Repair
Equipment Utilization Log
Vehicle/Heavy Equipment Inspection Checklist
Daily Operations Report
Explosive Disposal Log
Explosives Initial Receipt and Closeout Inventory
Lessons Learned
Root Cause Analysis Work Sheet
Blank DD Form 1348

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TETRA TECH EC, INC.

INTRUSIVE INVESTIGATION DATA/ MEC ACCOUNTABILITY FORM

FOR UXO TEAM USE

Site Name: | Team Leader:

Grid or Lane Number: | Work Area: | Date:

Location: X (Lat): _____ Y (Long): _____ Location Type (UW or UG): __
Other Location Information: _____
Depth (feet): _____ Inclination (Degrees): _____ Orientation (N–S, E-W): _____

TARGET/ANOMALY CHARACTERISTICS

Type of Target/Find: ☐ Surface Find ☐ Mag & Dig Target ☐ Primary Geo Target ☐ Validation (QA/QC) ☐ No Dig

Type of Anomaly: ☐ UXO ☐ MEC ☐ Inert ☐ Practice ☐ MC (waste) ☐ MD (scrap) ☐ Metal Waste ☐ No Find ☐ Rock ☐ Rust Layer ☐ Oxidation ☐ Misc.:_____ _____

Diameter/Width: | Length: | Estimated Weight:

DIGITAL PHOTO RECORD

Was photo taken? ☐ Yes ☐ No | Camera No.: | Frame No.: | File Name:

MUNITIONS NOMENCLATURE (If Known, Record Below and record fuze condition and disposition)

Munitions Mark/Mod: | Fuze Mark/Mod: ☐ Nose:_____ ☐ Tail: _____ ☐ Transverse:_____ ☐ Casing:_____ | N.E.W. Total:

MUNITIONS CHARACTERISTICS

Munitions Filler: ☐ Explosive ☐ Inert ☐ Propellant ☐ Pyrotechnic ☐ Unknown ☐ Other:__

Munitions Category: ☐ Depth Charges ☐ Land Mine ☐ Projectiles ☐ Sea Mines ☐ Bombs ☐ Grenades ☐ Misc. Explosive Devices ☐ Pyrotechnics and Flares ☐ Small Arms ☐ Clusters/Dispensers ☐ Guided Missiles ☐ Mortars ☐ Rockets ☐ Torpedoes

FUZE CHARACTERISTICS

Fuze Location(s) (check all that apply): ☐ Nose ☐ Tail ☐ Transverse ☐ Casing | Breaks in Fuze Body? ☐ Yes ☐ No | Fuze Markings:

Fuzing Type(s): ☐ Hydrostatic ☐ MT Long Delay ☐ Powder Train Time Fuze ☐ Nose MT/Tail Impact Inertia ☐ All-ways Acting ☐ Impact ☐ MT Superquick ☐ Pressure ☐ Pt-initiating-Base-detonating ☐ Base Detonating ☐ Influence ☐ Piezo-Electric ☐ Proximity (VT) ☐ Electric ☐ Mech Time (MT) ☐ Point Detonating (PD) ☐ Nose MT/Tail Pressure

Fuze Length: | Fuze Diameter: | Diameter of Fuze Well:

MEC STATUS & PHYSICAL CONDITION (Check all that apply)

☐ Armed ☐ Unarmed ☐ Fired ☐ Unfired
☐ Intact ☐ Broken Open ☐ Filler Visible ☐ Soil Staining

FOR SUXOS USE

Disposition: (Clarify Under Remarks) ☐ Transferred ☐ Transported ☐ Left In Place ☐ Destroyed ☐ BIP ☐ Other : _____ | Date:

Client Notifications By:	Signature:	Date
Transferred To:	Signature:	Date:
Destroyed By:	Signature	Date:

Remarks:

SUXOS Signature: | Date:

TETRA TECH EC, INC.

SURFACE CLEARANCE DATA FORM

For UXO Team Use

Project Name: _____ Date: _____

Project Location: _____

Anomaly/Scrap Data

Survey Lane or Grid No.	# MEC	# MC	Comments

Digital Photo Record

Were photos taken? ☐ Yes ☐ No (If so, list the camera no., frame no., and file name below)

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

For SUXOS Use

Disposition of scrap and waste: (Clarify under remarks)

☐ Consolidated on Site ☐ Transported to Storage ☐ Left in Place

Transported By: Signature: Date:

Transferred To: Signature: Date:

Storage Location:

Remarks:

TETRA TECH EC, INC

MEC TRACKING LOG

MEC Data

Report No.	Item	Category (UXO, Inert, etc.)	Found (Date)	Location	Disposition	Photo Ref No.	Final Disposition Date

Log Verification

SUXOS Signature	Date:

TETRA TECH EC, INC.

PREPARATORY PHASE INSPECTION REPORT

Project Name: _____ Project No: _____ Report No: _____

UXO Team: Location: Date:

I. Definable Feature of Work

☐ Project Management	☐ Geophysical Mapping	☐ Data Management	☐ Brush Clearing
☐ Intrusive Investigation	☐ UXO Avoidance	☐ Demolition	☐ Survey
☐ Surface Clearance	☐ Anomaly Reacquisition	☐ Transect Activity	☐ Scrap Processing
☐ GIS Management	☐ Mobilization/Demobilization	☐ Acceptance Sampling	☐ Other:

II. References (USACE DIDs, Corporate references, SOPs, etc.):

III. Personnel Present (employees performing the work) Attach supplemental sheet if necessary

Name	Position	Company

IV. Submittals Reviewed (Work Plan, EHSP, Permits, etc.)

Submittals Reviewed.	Item No. (Rev No.)	Date	Approval Authority

Have all submittals been approved? ☐ Yes ☐ No

If No, what items have not been submitted/ approved?

Are all submittals on hand? ☐ Yes ☐ No

If No, what items are missing?

Check approved submittals against delivered material. (This should be done as material arrives.)

Comments:

V. Resources (Personnel & Equipment)

Are adequate resources on hand to effectively conduct work? ☐ Yes ☐ No

If No, what action will be taken?

VI. Procedures (Project Manger should be involved in this stage of the inspection)

Review contract specifications. (List special requirements such as location accuracy, format for deliverables, etc.)

TETRA TECH EC, INC.

PREPARATORY PHASE INSPECTION REPORT

Project Name: _____ Project No: _____ Report No: _____

UXO Team: Location: Date:

Discuss procedure for accomplishing the work (Reference WP Section or SOP).

Clarify any differences (revisions needed).

VII. Resolve Differences (What did you do to resolve outstanding issues/problems)

Comments:

VIII. Testing/ Surveillance

Identify Tests/ Surveillance to be performed, frequency, and by whom.

Where will the testing to take place (in the test bed, at a selected monument, etc.)?

Is the Testing/ Surveillance Plan Adequate?

IX. Safety

Review applicable portion of the Health and Safety Plan.

Has the Activity Hazard Analysis been approved? ☐ Yes ☐ No

X. Results of Inspection

☐ Acceptable ☐ Unacceptable NCR #:

Name: Signature: Date:

QCM Comments

QCM Review

☐ Concur ☐ Non-Concur Signature: Date

XI. Distribution

☐ PM ☐ SITE MGR ☐ UXOQC ☐ SUXOS ☐ CLIENT REP

UXO-03 Version 3 4/27/2005

TETRA TECH EC, INC.

INITIAL PHASE INSPECTION REPORT

Project Name: _____ Report No: _____

Project No: Location: Date:

I. Definable Feature of Work

☐ Project Management	☐ Geophysical Mapping	☐ Data Management	☐ Brush Clearing
☐ Intrusive Investigation	☐ UXO Avoidance	☐ Demolition	☐ Survey
☐ Surface Clearance	☐ Anomaly Reacquisition	☐ Transect Activity	☐ Scrap Processing
☐ GIS Management	☐ Mobilization/Demobilization	☐ Acceptance Sampling	☐ Other:

II. References (USACE DIDs, Corporate references, SOPs, etc.):

III. Personnel Present (employees performing the work) Attach supplemental sheet if necessary

Name	Position	Company

IV. Preparatory Work (equipment set up & testing, EZ set up, logbook entries, etc.)

Is preliminary work complete and correct? ☐ Yes ☐ No

If No, what action(s) will be taken?

V. Task Execution

Is work being completed in accordance with plans and specifications? ☐ Yes ☐ No

If No, what corrective action(s) will be taken?

Is workmanship acceptable? ☐ Yes ☐ No

If No, what action(s) will be taken?

V. Resolve Differences

Comments:

TETRA TECH EC, INC.

INITIAL PHASE INSPECTION REPORT

Project Name: _____ Report No: _____

Project No: Location: Date:

VI. Safety (Review work conditions using EHSP and AHAs)

Comments:

VII. Results of Inspection

☐ Acceptable ☐ Unacceptable NCR #:

Name:	Signature:	Date:

QC Manager Comments

QC Manager Review

☐ Concur	☐ Non-Concur	Signature:	Date

VIII. Distribution

☐ PM ☐ SITE MGR ☐ UXOQC ☐ SUXOS ☐ CLIENT REP

UXO-04 Version 3 4/27/2005

TETRA TECH EC, INC.

FOLLOW-UP INSPECTION/SURVEILLANCE REPORT

Project Name: _____ Report No: _____

Project No: Location: Date:

I. Definable Feature of Work

☐ Project Management	☐ Geophysical Mapping	☐ Data Management	☐ Brush Clearing
☐ Intrusive Investigation	☐ UXO Avoidance	☐ Demolition	☐ Survey
☐ Surface Clearance	☐ Anomaly Reacquisition	☐ Transect Activity	☐ Scrap Processing
☐ GIS Management	☐ Mobilization/Demobilization	☐ Acceptance Sampling	☐ Other:

II. Type of Inspection

☐ Follow-up ☐ Surveillance

II. References (USACE DIDs, Corporate references, SOPs, etc.):

III. Activities/Conditions Observed

Conducted By:	Signature:	Date:

X. UXOQC Review

☐ Acceptable ☐ Unacceptable NCR #:

Comments:

Name:	Signature:	Date:

XI. Distribution

☐ PM ☐ SUXOS ☐ UXOSO ☐ UXO Quality Manager ☐ Client Rep

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TETRA TECH EC, INC

DAILY QUALITY CONTROL REPORT

Project Name: _____ Report No: _____

Project No: Location: Date:

☐ Sunday ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday

Weather/Precipitation:	High Temperature: Low Temperature:	Wind:	Humidity

I. Personnel Present (Reference/attach superintendent's daily report if applicable)

Name	Position	Company

II. Work Performed

III. Quality Control Activities (Reference/attach inspection/surveillance reports):

IV. Problems Encountered / Corrective Actions Taken

V. Directions Given / Received:

VI. Special Notes / Lessons Learned

VII. Visitors

VIII. Approval

Name and Signature:	Title/Company:	Date:

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TETRA TECH EC, INC.

NON-CONFORMANCE REPORT

Project Name: _____ Report No: _____

Project No: _____ Location: _____ Date: _____

Description of Process :

I. Description of Non-conformance *(Items involved; specification, code or standard to which the items do not conform) (Provide sketch if applicable)*

Name & Signature of Person Reporting Non-conformance:	Title/Company:	Date:

II. Root Cause Analysis

Immediate Causes: What actions and conditions contributed to this event? Check all that apply:

Substandard Acts	
☐ Operating equipment without authority	☐ Inadequate inspection/peer review
☐ Failure to follow/improper execution of procedure	☐ Poor judgment
☐ Using equipment improperly	☐ Failure to communicate—written and/or verbal
☐ Improper servicing/maintenance of equipment	☐ Acceptance of defective equipment/material
☐ Under influence of alcohol/drugs	☐ Other substandard acts
☐ Horseplay	

Substandard Conditions	
☐ Personnel not properly qualified or trained	☐ Inadequate oversight
☐ Defective equipment/material	☐ Inadequate procedure/instruction

Enter brief explanation of each *immediate cause* below:

Basic Causes: What specific personal or job management system factors contributed to this event? Check all that apply:

Personal Factors	Job Factors
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision
☐ Inadequate mental/psychological capability	☐ Inadequate engineering
☐ Physical or physiological stress	☐ Inadequate purchasing
☐ Lack of knowledge	☐ Inadequate maintenance
☐ Lack of skill	☐ Inadequate tools and equipment
☐ Improper motivation	☐ Inadequate work standards
☐ Other personal factors	☐ Excessive wear and tear
	☐ Abuse and misuse
	☐ Change
	☐ Other job factors

Enter brief explanation of each *basic cause* below:

Name & Signature of Person Conducting RCA:	Title/Company:	Date:

TETRA TECH EC, INC.

NON-CONFORMANCE REPORT

Project Name: _____ Report No: _____

Project No: _____ Location: _____ Date: _____

Description of Process :

III. Recommended Disposition *(Provide sketch if applicable)*

Name & Signature of Person Recommending Disposition:	Title/Company:	Date:

IV. Corrective Action ☐ Required ☐ Not Required

V. Verification of Disposition/Corrective Action ☐ Required ☐ Not Required

Name & Signature of Person Verifying Disposition/CA:	Title/Company:	Date:

VI. Approvals

☐ QCM	☐ PM	☐ Client	☐ Other
Name(Signature):	Name(Signature):	Name(Signature):	Name(Signature):
Date:	Date:	Date:	Date:
☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments

Distribution

☐ PM ☐ SITE MGR ☐ SUXOS ☐ CLIENT ☐ UXO Quality Manager

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TETRA TECH EC, INC.

Field Change Request (FCR) Form

Project Name:	Project Number:
Client:	Request Number: **FCR-**
Field Change Request Title:	

I. Description

II. Reason for Change

III. Recommended Disposition

Field Operations Lead (or designee)	Signature	Date

IV. Disposition

V. ☐ PESM (FCR Concerns Safety issues) QC Manager (FCR Concerns Quality issues)	☐ Operations Manager	☐ TtEC Project Manager	☐ Client Project Manager
Name *(Signature)*	Name *(Signature)*	Name *(Signature)*	Name *(Signature)*
Date	Date	Date	Date
☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments
Comments:	Comments:	Comments:	Comments:

VI. Distribution

Client Project Manager Project Manager QA/QC Field Operations Lead Project File	Other:

UXO-14
4/15/05

1 of 1

Version 2.2

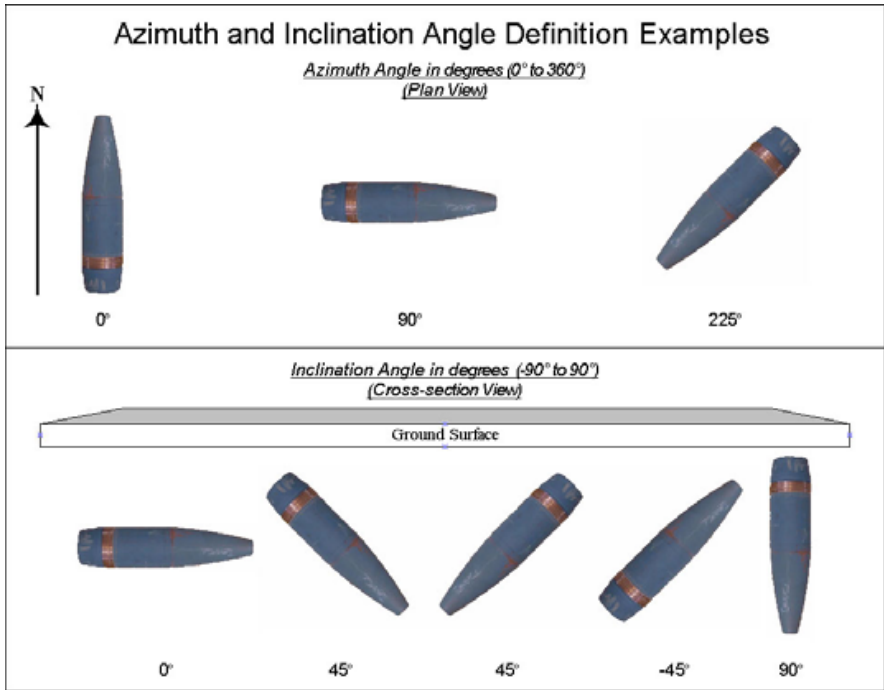
TETRA TECH EC, INC.

SEEDING CHECKLIST/ LOG

Area	No. of Transects Investigated	No. of Grids for Seeding (minimum @ 10%)	Type of Seed (simulated caliber)	Max Depth	Comments
11	145				

NOTES:

1. Randomly select Grids from Grids to be investigated
2. Bury inert ordnance items at locations in the randomly selected grids where geophysical surveys or mag and dig operations will be performed.
3. The seeded items should be painted blue and tagged with a non-biodegradable label identifying the items as inert and providing a point of contact address, phone number, and a unique target identifier.
4. The items will be placed at depths and orientations that, when surveyed effectively, will cause instrument responses that indicate the presence of a buried metallic item.
5. A log will be maintained documenting the exact location, depth Azimuth and Inclination of every seeded item.
6. If the seeded item is not detected, a Nonconformance report will be issued and a causal analysis/corrective action will be developed.



TETRA TECH EC, INC.

SEEDING CHECKLIST/ LOG

Item Number	Item Description	Transect Located	Exact Location Easting/Northing	Depth	Azimuth Angle	Inclination Angle	Item Recovered	Comments (Anomaly Number, Date Recovered, NCR Issued)
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	
							☐Yes ☐No	

TETRA TECH EC, INC.

DAILY INSTRUMENT PROVE-OUT REPORT

Project Name: Project No: Location: Date:

☐ Sunday ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday

I. Test Plot Information

Location:

Item Number	Inert Item/Surrogate Description	Depth (inches)	Azimuth/ Inclination Angle(Degrees)	Comments
1				
2				
3				
4				
5				

II. Instrument Information

Instrument Type/Manufacture	Instrument Serial Number	Test Plot Items Instrument Tested on (List Item Numbers)	Setting On Instrument Tested (As Per WP)	Test Results, ☒ indicates good for operation	Personnel Testing Equipment	Comments
				☐		
				☐		
				☐		
				☐		
				☐		
				☐		
				☐		
				☐		
				☐		
				☐		

III. Problems Encountered / Corrective Actions Taken.

explain in space below:

IV. Supervisor

Name and Signature:	Title/Company:	Date:

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TETRA TECH EC, INC.

STOP WORK REQUEST (SWR)

		Stop Work Request No.	
Project:	Project Number:	Contract Number:	Date:
Written Notice Issued to:			
Name:	Title:	Organization:	
Activity:		Location of Work Process:	
Name and Signature of Person Issuing SWR		Title/Company	
Verbal Notice Issued to:			
Name:	Title:	Date/Time Issued:	

NCR Issued:	Non Conformance Report Number:	CAR Issued	Corrective Action Request Number:
☐ YES ☐ NO		☐ YES ☐ NO	

Description of Stop Work Condition: (attach supporting documentation if necessary)

Remedial Action Required:

Remedial Action to be completed by:	Date to be Completed

Remedial Action Determined By:	Name:	Date
☐ Responsible Organization ☐ PESM ☐ QA/QC ☐ Operations Manager ☐ Project Manager		

Follow-up of Remedial Action Taken: (attach supporting documentation)

Verbal Notice to Resume Operations Given to:

Name:	Date/Time:

Stop Work Order Cancellation Authorized by

Name and Signature of Person Recommending CA	Title/Company	Date

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TETRA TECH EC, INC.

Stop Work Request Log

Project/Location:

Page of

SWR NUMBER	Individual Assigned Responsibilities For Corrective Action	RESPONSE DATES		REMEDIAL ACTION			Date Operations Resumed	Comments
				Implementation Due Date	VERIFICATION			
	Date Forwarded	Date Due	Received		Date Accepted	Date Rejected		

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TETRA TECH EC, INC.

OPERATOR PROFICIENCY TEST REPORT

Project Name: Project No: Location: Date:

☐ Sunday ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday

I. Test Plot Information

Location:	Total Targets Emplaced:	Required Min.

II. Instrument/Operator Information

Operator	Instrument Type/ Manu facture	Instrument Serial Number	Total Targets Missed	Results	Comments
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	
				☐ Passed ☐ Failed	

III. Problems Encountered / Corrective Actions Taken.

explain in space below:

IV. Supervisor

Name and Signature:	Title/Company:	Date:

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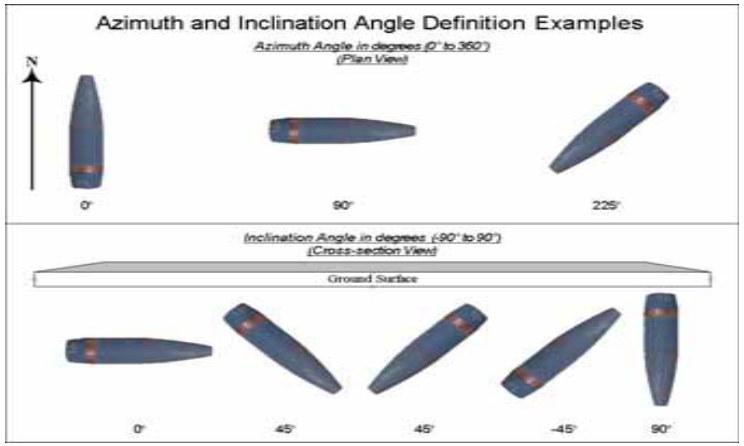
TETRA TECH EC, INC.

OPERATOR TEST PLOT SETUP REPORT

Project Name:	**Project No**:	**Location**:

Instructions:

1. The seed items should be painted blue and tagged with a non-biodegradable label identifying the items as inert and providing a point of contact address, phone number, and a unique target identifier.
2. The item should then be photographed with the depth, Azimuth, and Inclination Angle clearly marked on a small white board prior to burial.
3. Holes are excavated with a shovel and/or a small backhoe.
4. The seed items are placed in the respective hole and the depth measured using a rigid measuring tape. Measurements are recorded to the end(s) and/or centroid of each item using a metal bar (or equivalent) placed across the hole at ground level for reference. A picture is taken of the item in the open hole.
5. A DGPS antenna < 3 ft in height above the ground surface is used to survey the x-y-z location of the centroid of each item, and the ends of larger items depending upon the orientation (dip) of the item.
6. The items will be placed at depths and orientations that, when surveyed effectively, will cause instrument responses that indicate the presence of a buried metallic item.
7. This list will be considered confidential information and shall be maintained by the Quality Control Specialist onsite in secured storage.



Item Number	Item Description	Location Ft (N) Ft (E/W)	Exact Location Easting/Northing	Depth (Inches)	Azimuth Angle	Inclination Angle	Comments
1							
2							
3							
4							
5							
6							

TETRA TECH EC, INC.

OPERATOR TEST PLOT SETUP REPORT

Item Number	Item Description	Location Ft (N) Ft (E/W)	Exact Location Easting/Northing	Depth (Inches)	Azimuth Angle	Inclination Angle	Comments
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							

Note: The setup information for the Instrument Operator Test Plot is strictly confidential and should only be handled by the UXOQC onsite. If this document is found by other project personnel please contact the UXO Program Quality Manager Don Welch at (256)454-4451 immediately.

TETRA TECH EC, INC.

INDIVIDUAL OPERATOR PROFICIENCY TEST SHEET

Project Name:	Project No:	Location:	Date:

☐ Sunday ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday

I. Test Plot Information

Location of Test Strip:	Total Targets Emplaced:	Required Min.

II. Instrument/Operator Information

Operator	Instrument Type/ Manu facture	Instrument Serial Number

III. Field Test Results

Time Started	Time Completed	Number of Flags Emplaced	Number of Test Items Missed	☐ Passed
				☐ Failed

Item	Flagged	Item	Marked
1		21	
2		22	
3		23	
4		24	
5		25	
6		26	
7		27	
8		28	
9		29	
10		30	
11		31	
12		32	
13		33	
14		34	
15		35	
16		36	
17		37	
18		38	
19		39	
20		40	

✓ Flagged X Not Flagged

IV. Problems Encountered / Corrective Actions Taken.

explain in space below:

V. Supervisor

Name and Signature:	Title/Company:	Date:

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EQUIPMENT MAINTENANCE/REPAIR

MAINTENANCE/REPAIR NO._____

NECESSARY ATTACHMENTS _____ PACKING SLIP, and/or _____ MRR, abd _____LOGS

TYPE OF EQUIPMENT	SERIAL NO.
MAKE:	MODEL:
P O NUMBER	DELIVERY ORDER NO.
STANDARD MAINTENANCE	DATE
DESCRIPTION OF PROBLEM (if any) _____ _____ _____	

MAINTENANCE/REPAIRS TO BE PERFORMED

IN-HOUSE REPAIRS	DATE
SENT OUT TO	COST ESTIMATE AIRBILL NO. P O NO. DATE RET'D
CORRECTIVE ACTION _____ _____ _____ _____	

PARTS LIST

PART DESCRIPTION	QUANTITY	COST/EA
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

TOTAL LABOR (hours) PERFORMED BY	DATE
RETURNED TO WHICH JOB SITE/WAREHOUSE	

EQUIPMENT UTILIZATION LOG

EQUIPMENT I.D._____

DESCRIPTION_____

DATE OUT	TIME OUT	COND. CODE & COMMENTS OUT	CHECKED OUT BY	DATE IN	TIME IN	CHECKED IN BY	COND. CODE & COMMENTS IN

TETRA TECH EC, INC.

VEHICLE/HEAVY EQUIPMENT INSPECTION CHECKLIST – Attachment 2

Project:		Equipment Type:	
Equipment No.		Model:	
Manufacturer:		Date:	
Engine Hrs/Mileage		Team Number:	

Equipment Checklist (Check all that apply and provide description of corrections needed)

	Condition Good	Correction Needed
Steering		
Service Brakes		
Emergency Brakes		
Retarder		
Transmission		
Controls		
Hydraulic Leaks		
Exhaust System		
Warning Gauges		
Windshield		
Lights		
Mirrors		
Seat and Seat Belts		
Tires/Tread		
Regular Horn		
Back-up Alarm		
Steps, Hand-holds		
Fire Extinguisher		
Rollover Cage		
Other:		
Other:		

Remarks:

Approvals

Operator's Signature (Team Leader):	Date:
SUXOS Signature:	Date:
Equipment Supervisor's Signature (Repairs or Adjustments Completed):	Date:

Page 1 *of* _

Tetra Tech EC Inc
DAILY OPERATIONS REPORT

Date:

CONTRACT & PROJECT NO	Project Title: Project Location:	**REPORT #**

AM WEATHER CONDITIONS	PM WEATHER CONDITIONS	MAX. TEMP.	MIN. TEMP.

WORK PERFORMED TODAY

WORK LOCATION AND DESCRIPTION	EMPLOYER	NO.	TRADE	HRS
1.				

JOB SAFETY		
	Was a Job Safety Meeting held this date?	Total Work Hours On Job Site This Date:
	Were there any lost time accidents this date?	Cumulative Total of Previous Work Hrs:
	Was Trenching / Scaffolding / Electrical Work Done?	Total Hrs From Start of project:
	Was Hazardous Material Waste released into the environment?	

List Safety Actions Taken Today / Safety Inspection Conducted:

EQUIPMENT / RENTALS	VENDOR	P.O. #	CHARGE #	UNIT RATE	HRS	INCURED COST	

MATERIALS / SUPPLIES RECEIVED	VENDOR	P.O. #	CHARGE #	UNIT RATE	QTY REC'D	INCURED COST	P.O. QTY

NEW ONGOING COSTS	VENDOR	P.O. #	CHARGE #	First or Last Day	UNIT RATE		

SUB. / SERVICES DESCRIPTION	VENDOR	P.O. #	CHARGE #	F/P or L/S (type)	COST INCUR	% COMPLETE	ACCUM % COMPLETE

Comments:

ID	DESCRIPTION	GRID/TRANSECT	GRID COORDINATES	DEPTH	ORIENTATION	TYPE

TtEC Inc. SUXOS Date:

EXPLOSIVE DISPOSAL LOG

Project Information

Project Name: _____ Start Time: _____

Project _____ Stop time: _____

MEC Disposed of This Date (List items and quantity of each item)

Donor Explosive Used (List types and quantity)

Remarks

Approval

Demolition Supervisor: _____ Date: _____

TETRA TECH EC, INC.

INITIAL RECEIPT AND CLOSEOUT INVENTORY

DATE OF ACQUISITION	MANUFACTURER	MANUFACTURER'S MARKS	QUANTITY	DESCRIPTION	NAME, ADDRESS, LICENSE # OF PERSON DELIVERING EXPLOSIVES

Note: The initial receipt inventory must be recorded no later than the close of the next business day following the date of acquisition. And the closeout inventory must be recorded no later than the close of the next business day following the date of close out.

TETRA TECH EC, INC.

TETRA TECH EC, INC.

LESSONS LEARNED REPORT FORM

Client:	Project Number:
Project:	Location:
Type Of Project:	

I. **TOPIC**

II. **DESCRIPTION** (Narrative of relevant events, problem, impact)

III. **LESSON(S) LEARNED** (e.g. Project Specific, Location Specific, Company-wide):

IV. **RECOMMENDED FUTURE ACTION**
(e.g., Revise Project Procedures, Company Procedures, Additional Training):.

V. **EVALUATION BY DEPARTMENT HEAD** (e.g., Support Recommendation, Alternate Recommendation):

VI. List supporting data/ references (if applicable)

Reference/ Supporting Data:	Location:

VII. ☐ PM	☐ QCM	☐ VP of UXO Operations
Name *(Signature)*	Name *(Signature)*	Name *(Signature)*
Date	Date	Date
☐ Accepted ☐ Rejected ☐ Accepted with Comments Comments:	☐ Accepted ☐ Rejected ☐ Accepted with Comments Comments:	☐ Accepted ☐ Rejected ☐ Accepted with Comments Comments:

VIII. Forward Approved Lessons Learned Report to VP of Support Services

Name *(Signature)*	Date	☐ Accepted ☐ Rejected ☐ Accepted with Comments Comments:

TETRA TECH EC, INC.

Root Cause Analysis – Areas of Inquiry Worksheet

This worksheet is meant to be utilized as part of the incident investigation procedure and to determine areas requiring further analysis via root cause analysis (i.e. SCAT Chart, "The 5 Whys"). After conducting the incident investigation and collecting the necessary information, answer the following "Areas of Inquiry" questions providing comments as appropriate to ensure clarification of the answer. Note: It is possible that additional investigation may be identified as necessary during completion of this worksheet.

Summary Statement of the Incident

Summary;

A. Personnel

Question	Response	Comment
1. Were workers experienced / trained in the tasks they were assigned to?	☐ Yes ☐ No ☐ N/A	
2. Were workers performing tasks in accordance with training/project plans/ directions provided?	☐ Yes ☐ No ☐ N/A	
3. Was the work adequately staffed?	☐ Yes ☐ No ☐ N/A	
4. Were workers using equipment / tools /PPE/ materials properly?	☐ Yes ☐ No ☐ N/A	
5. Were workers physically capable of safely performing the work?	☐ Yes ☐ No ☐ N/A	
6. Was there evidence of worker fatigue or undue stress?	☐ Yes ☐ No ☐ N/A	
7. Was there evidence of possible substance abuse?	☐ Yes ☐ No ☐ N/A	

TETRA TECH EC, INC.

B. Management		
Question	**Response**	**Comment**
1. Was there an adequate process for Identifying safety & health and quality concerns and hazards	☐ Yes ☐ No ☐ N/A	
2. Were safety/quality requirements and expectations effectively communicated to employees?	☐ Yes ☐ No ☐ N/A	
3. Was safety/quality involved and integrated into project planning and performance?	☐ Yes ☐ No ☐ N/A	
4. Were safety/quality related roles and responsibilities adequately defined, assigned, and communicated?	☐ Yes ☐ No ☐ N/A	
5. Were safety/quality requirements effectively monitored and enforced?	☐ Yes ☐ No ☐ N/A	
6. Was supervision at the worksite adequate?	☐ Yes ☐ No ☐ N/A	
7. Were measures taken to ensure that safety & health hazards and quality concerns would be recognized, evaluated and controlled?	☐ Yes ☐ No ☐ N/A	
8. Was management oversight of subs / visitors / other Non-Tt personnel relevant to the work adequate?	☐ Yes ☐ No ☐ N/A	

TETRA TECH EC, INC.

B. Management (Continued)		
Question	**Response**	**Comment**
9. Were regular safety/ quality communications and inspections assigned and implemented?	☐ Yes ☐ No ☐ N/A	
10. Were processes in place to address H&S/ quality concerns identified during inspections / communications?	☐ Yes ☐ No ☐ N/A	
11. Did project / site management foster effective leadership and example pertaining to health and safety and quality?	☐ Yes ☐ No ☐ N/A	
12. Other management related direct causes?	☐ Yes ☐ No ☐ N/A	

TETRA TECH EC, INC.

C. Task		
Question	**Response**	**Comment**
1. Was a task hazard analysis performed (HASP/JSA/ AHA/ other)?	☐ Yes ☐ No ☐ N/A	
2. Was the task hazard analysis appropriate / complete / communicated?	☐ Yes ☐ No ☐ N/A	
3. Was the activity addressed in the HASP/JSA/ AHA/ or other?	☐ Yes ☐ No ☐ N/A	
4. Was a safe work practice / procedure available and used?	☐ Yes ☐ No ☐ N/A	
5. Was the safe work practice/ procedure appropriate for the task?	☐ Yes ☐ No ☐ N/A	
6. Had conditions changed that affected the validity of the safe work practice / procedure?	☐ Yes ☐ No ☐ N/A	
7. Were the appropriate equipment, tools, PPE and materials available?	☐ Yes ☐ No ☐ N/A	
8. Were they properly used?	☐ Yes ☐ No ☐ N/A	
9. Were safety devices available / used / working properly?	☐ Yes ☐ No ☐ N/A	
10. Was the task conducted in accordance with relevant project plans?	☐ Yes ☐ No ☐ N/A	
11. Were directions outside of the relevant plans given to project personnel?	☐ Yes ☐ No ☐ N/A	
12. Were there other task related direct caused?	☐ Yes ☐ No ☐ N/A	

TETRA TECH EC, INC.

D. Tools / Materials / Equipment		
Question	**Response**	**Comment**
1. Were the appropriate materials and equipment identified and used for the task involved in the incident?	☐ Yes ☐ No ☐ N/A	
2. Was there an equipment malfunction?	☐ Yes ☐ No ☐ N/A	
3. Was the equipment / material used in accordance with the manufacturer's intentions?	☐ Yes ☐ No ☐ N/A	
4. Was the equipment / material used in accordance with company policies/procedures and applicable project plans?	☐ Yes ☐ No ☐ N/A	
5. Was the equipment / calibrated in accordance with the manufacturer's specifications?	☐ Yes ☐ No ☐ N/A	
6. Were there other material / equipment related direct causes?	☐ Yes ☐ No ☐ N/A	

TETRA TECH EC, INC.

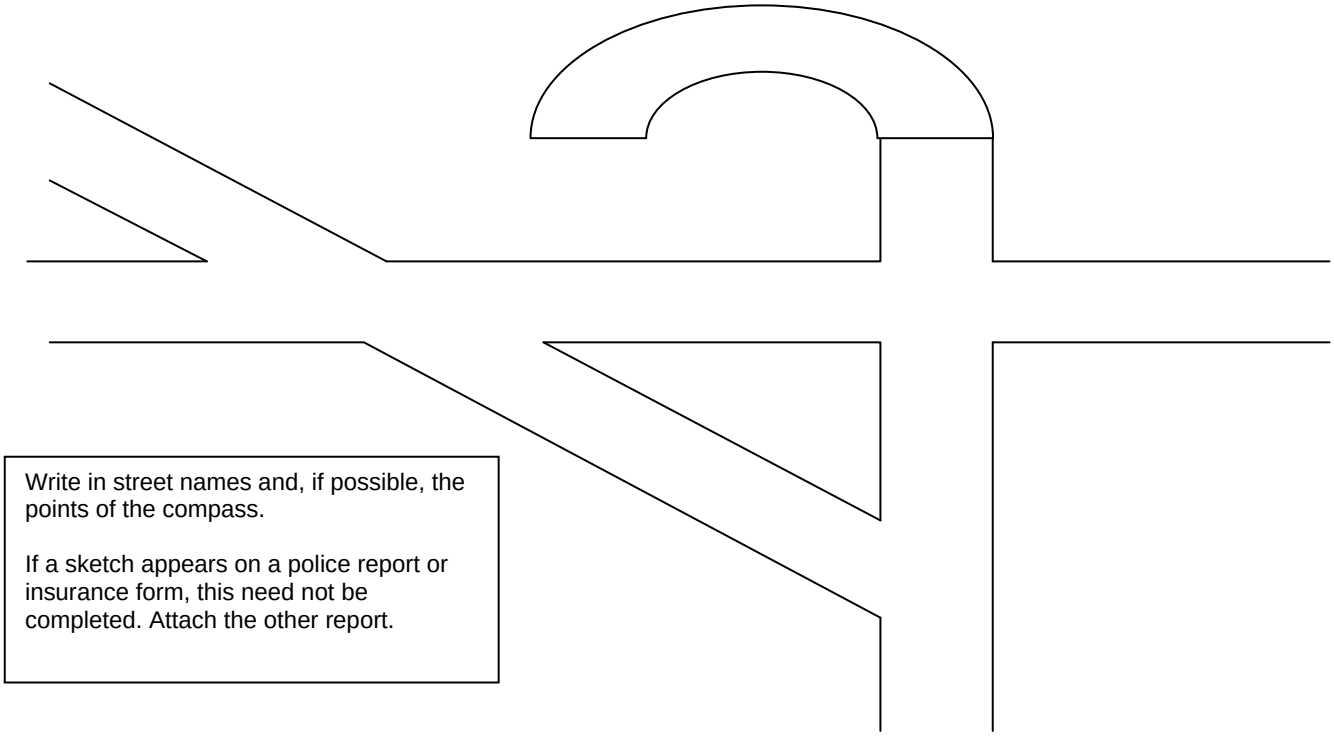
D. Work Environment		
1. Were there extreme weather conditions in the work area at the time of the incident?	☐ Yes ☐ No ☐ N/A	
2. Was housekeeping in the area adequate?	☐ Yes ☐ No ☐ N/A	
3. Were there high ambient Noise levels in the work area?	☐ Yes ☐ No ☐ N/A	
4. Were there client / other contractor activities ongoing adjacent / concurrent with the Tt work area?	☐ Yes ☐ No ☐ N/A	
5. Were there temperature extremes issues in the work area?	☐ Yes ☐ No ☐ N/A	
6. Was there adequate illumination in the work area?	☐ Yes ☐ No ☐ N/A	
7. Were hazardous substances present in the work environment?	☐ Yes ☐ No ☐ N/A	
8. Were there other environment-related direct causes?	☐ Yes ☐ No ☐ N/A	

TETRA TECH EC, INC.

Sketch the accident scene and attach photos to this worksheet.

Event Sketch

Vehicle Events



Write in street names and, if possible, the points of the compass.

If a sketch appears on a police report or insurance form, this need not be completed. Attach the other report.

TETRA TECH EC, INC.

5 Why Process

After the investigation has been conducted (interviews, inspection of accident scene, review of documents etc.) answer the question sets in the RCA Areas of Inquiry (AOI) Worksheet to systematically evaluate the data collected and areas for in-depth root cause analysis. Use the table below to document the 5 Why process for each area of inquiry that is relevant to the incident (where answers to a question or group of questions resulted in an undesirable outcome). Rewrite the area of inquiry of concern as a statement rather than a question and ask why. Then continue to ask why to the answers of each proceeding question until you reach root causes. NOTE: There may be two answers to a particular question, in which case you should continue the 5 why process with each answer separately.

Statement:

1. Why?	
2. Why?	
3. Why?	
4. Why?	
5. Why?	

TETRA TECH EC, INC.

Immediate Causes

What actions and conditions contributed to this event? Check all that apply:

Substandard Acts	
☐ Operating equipment without authority	☐ Horseplay
☐ Failure to warn	☐ Using equipment improperly
☐ Failure to secure	☐ Failure to follow procedure/improper execution of procedure
☐ Operating at improper speed	☐ Personnel NOt properly qualified
☐ Making safety devices iNOperable	☐ Failure to communicate—written and/or verbal
☐ Removing safety devices	☐ Operating equipment outside of specified parameters
☐ Using defective equipment	☐ Failure to check equipment prior to acceptance
☐ Failure to use PPE properly	☐ Acceptance of defective equipment/material
☐ Improper loading	☐ Failure to provide proper equipment
☐ Improper placement	☐ Improper servicing/maintenance of equipment
☐ Improper lifting	☐ Other substandard acts
☐ Improper position for task	☐ Servicing equipment in operation
☐ Under influence of alcohol/drugs	☐ Inadequate inspection/peer review
☐ Poor judgment	☐ Other substandard acts
Substandard Conditions	
☐ Guards or barriers	☐ Exposure to hazardous materials
☐ Protective equipment	☐ Extreme temperature exposure
☐ Tools/equipment or materials	☐ Illumination
☐ Congestion	☐ Ventilation
☐ Warning system	☐ Visibility
☐ Fire and explosion hazards	☐ Radiation
☐ Poor housekeeping	☐ Hazardous environmental conditions
☐ NOise exposure	☐ Personnel NOt properly qualified or trained
☐ Inadequate oversight	☐ Inadequate procedure/instruction
☐ Defective equipment/material	☐ Other substandard conditions

Enter brief explanation of each ***immediate cause*** below:

TETRA TECH EC, INC.

Basic Causes	
What specific personal or job management system factors contributed to this event? Check all that apply:	
Personal Factors	**Job Factors**
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision
☐ Inadequate mental/psychological capability	☐ Inadequate engineering
☐ Physical or physiological stress	☐ Inadequate purchasing
☐ Lack of kNOwledge	☐ Inadequate maintenance
☐ Lack of skill	☐ Inadequate tools and equipment
☐ Improper motivation	☐ Inadequate work standards
☐ Other personal factors	☐ Excessive wear and tear
	☐ Abuse and misuse
	☐ Change
	☐ Other job factors
Enter brief explanation of each ***basic cause*** below:	

TETRA TECH EC, INC.

Tetra Tech EC Accident / Incident Statement	
NAME LAST, FIRST:	**DATE OF ACCIDENT / INCIDENT:**
BADGE #:	**LOCATION OF ACCIDENT / INCIDENT:**
DEPARTMENT:	**TIME OF ACCIDENT / INCIDENT:**
JOB DESCRIPTION	**VEHICLE MAKE(IF MOTOR VEHICLE ACCIDENT – MVA OR OTHER):**
EMPLOYEE CONTACT NUMBER:	**VEHICLE VIN (IF MVA OR OTHER):**
SUPERVISOR:	**VEHICLE BAR TAG# AND CEA # (IF MVA OR OTHER):**
Your statement is important to the successful resolution of the Accident/Incident under investigation. It should be limited to the facts of the issue and should not set forth your opinions. Your opinions may be provided to the investigating official. Your statement will be used within the company to support property actions, further safety/quality and security investigation/reviews, and other administrative reasons. Your statement may be provided to the Government in the furtherance of contractual obligations but may not be released to third parties.	
STATEMENT:	

STATEMENT CONT:

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1 2 3 4 5 6 7 23 24 25 26 27 28 29 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

DOCUMENT	RI FROM	M&S	UNIT	QUANTITY	SER	SUPPLEMENTARY ADDRESS	SIG	FUND	DISTRIBUTION	PROJECT	PRI	REQD	DELTE	ADV	RI	O/P	COND	MGT	UNIT PRICE DOLLARS	UNIT PRICE CTS

1. TOTAL PRICE DOLLARS	1. TOTAL PRICE CTS	2. SHIP FROM	3. SHIP TO
		4. MARK FOR	

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE

22. RECEIVED BY	23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

25. NATIONAL STOCK NO. & ADD (8-22)

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

27. ADDITIONAL DATA

PREVIOUS EDITION MAY BE USED

PerFORM (DLA)

APPENDIX G
MSD CALCULATION SHEETS

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FRAGMENTATION DATA REVIEW FORM

Database Revision Date 9/30/07

Category:	HE Rounds	DODIC:	D571
Munition:	155 mm M107	Date Record Created:	7/30/2004
		Last Date Record Updated:	7/30/2004
Primary Database Category:	projectile	Individual Last Updated Record:	Crull
Secondary Database Category:	155 mm	Date Record Retired:	
Munition Case Classification:	Robust		

Munition Information and Fragmentation Characteristics

Explosive Type:	Comp B
Explosive Weight (lb):	15.44800
Diameter (in):	6.1024
Max Fragment Weight (lb):	0.648213
Critical Fragment Velocity (fps):	3426

Theoretical Calculated Fragment Range

HFD [Range to No More Than 1 Hazardous Fragment per 600 Square Feet] (ft):	447
MFR-V [Vertical Range of Max Weight Fragment] (ft):	1983
MFR-H [Horizontal Range of Maximum Weight Fragment] (ft):	2577

Overpressure Distances

Inhabited Building Distance (12 psi), K40 Distance:	112
Inhabited Building Distance (09 psi), K50 Distance:	141
Intentional MSD (0065 psi), K328 Distance:	922

Minimum Thickness to Prevent Perforation

4000 psi Concrete (Prevent Spall):	6.82
Mild Steel:	1.27
Hard Steel:	0.64
Aluminum:	2.59
LEXAN:	6.76
Plexi-glass:	5.13
Bullet Resist Glass:	4.43

Required Sandbag Thickness

Max Fragment Weight (lb)SB:	0.648213
Critical Fragment Velocity (fps)SB:	3426
Kinetic Energy 106 (lb-ft2/s2)SB:	3.8042
Required Wall Roof Sandbag Thickness (in)SB:	36
Expected Maximum Sandbag Throw Distance (ft)SB:	220
Minimum Separation Distance (ft)SB:	220

Water Containment System and Minimum Separation Distance:

Max Fragment Weight (lb)W:	0.648213
Critical Fragment Velocity (fps)W:	3426
Kinetic Energy 106 (lb-ft2/s2)W:	3.8042
Water Containment System:	1100 gal tank
Minimum Separation Distance (ft)W:	275

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FRAGMENTATION DATA REVIEW FORM

Database Revision Date 9/30/07

Category:	HE Rounds	DODIC:	C225
Munition:	81 mm M43	Date Record Created:	7/30/2004
		Last Date Record Updated:	7/30/2004
Primary Database Category:	mortar	Individual Last Updated Record:	Crull
Secondary Database Category:	81 mm	Date Record Retired:	
Munition Case Classification:	Robust		

Munition Information and Fragmentation Characteristics

Explosive Type:	Comp B
Explosive Weight (lb):	1.29000
Diameter (in):	3.1890
Max Fragment Weight (lb):	0.057300
Critical Fragment Velocity (fps):	4933

Theoretical Calculated Fragment Range

HFD [Range to No More Than 1 Hazardous Fragment per 600 Square Feet] (ft):	230
MFR-V [Vertical Range of Max Weight Fragment] (ft):	1097
MFR-H [Horizontal Range of Maximum Weight Fragment] (ft):	1395

Overpressure Distances

Inhabited Building Distance (12 psi), K40 Distance:	49
Inhabited Building Distance (09 psi), K50 Distance:	61
Intentional MSD (0065 psi), K328 Distance:	403

Minimum Thickness to Prevent Perforation

4000 psi Concrete (Prevent Spall):	3.62
Mild Steel:	0.68
Hard Steel:	0.56
Aluminum:	1.43
LEXAN:	4.51
Plexi-glass:	3.00
Bullet Resist Glass:	2.40

Required Sandbag Thickness

Max Fragment Weight (lb)SB:	0.057300
Critical Fragment Velocity (fps)SB:	4933
Kinetic Energy 106 (lb-ft2/s2)SB:	0.6972
Required Wall Roof Sandbag Thickness (in)SB:	24
Expected Maximum Sandbag Throw Distance (ft)SB:	125
Minimum Separation Distance (ft)SB:	200

Water Containment System and Minimum Separation Distance:

Max Fragment Weight (lb)W:	0.057300
Critical Fragment Velocity (fps)W:	4933
Kinetic Energy 106 (lb-ft2/s2)W:	0.6972
Water Containment System:	1100 gal tank
Minimum Separation Distance (ft)W:	200

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APPENDIX H
RESUMES

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Mr. Arthur B. Holcomb, PE
Vice President

EXPERIENCE SUMMARY

Twenty-five years of progressively responsible experience in project management, remediation, remedial design investigation, industrial hygiene, and environmental engineering related to hazardous and toxic waste and other environmental programs. A Certified Industrial Hygienist (ret), as well as a registered professional engineer. Experienced in managing indefinite delivery task order contracts, both fixed price and cost reimbursable, according to the requirements of the FAR and DFARS. Successfully developed and managed complex and controversial projects in government and industry requiring community and regulatory interaction. Served at the senior project manager level for nearly 10 years.

EDUCATION

BS, Civil Engineering, University of Texas, 1976
MS, (PH) Industrial Hygiene, University of Alabama in Birmingham, 1983

REGISTRATIONS/CERTIFICATIONS

Professional Engineer, Civil, AL, Number 21126, Earned 5/10/96, Expires 12/31/08
Professional Engineer, Civil, TX, Number 51424, Earned 6/4/82, Expires 3/31/09
Certified Industrial Hygienist, Number 4663 (Retired), Earned 2/28/96,
NCEES, Number 14124, Earned 2/28/96, Expires 2/1/09

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training - 1989
8-Hour OSHA Hazardous Waste Health and Safety Supervisor Training - 1990
8-Hour OSHA Hazardous Waste Health and Safety Refresher Course - Current
Cross Training - 1990

CORPORATION PROJECT EXPERIENCE

(10/05-Present) MR Response and Services at Sites CONUS and OCONUS; USAESC-Huntsville, AL. Program Manager of this five-year, ID/IQ contract supporting USAESCH by providing munitions response and other munitions-related services at sites CONUS and OCONUS. Responsible for overseeing the seven task orders that have been awarded, including management of CMC in Iraq, site investigations, EE/CAs, evaluations, MEC and other munitions related activities, RCWM responses, booby trap clearances, disablement of improvised explosives devices, site security, and UXO and CWM removal actions at Indianna Army Ammunitions Plant, Fort McClellan, Camp Swift, and Raritan Arsenal . Providing consultation and direction on contract requirements and related issues, performance cost issues, and review and approval of select deliverables, including weekly and monthly progress and cost reporting. For the CEA TO, coordinated planning through Huntsville for the accelerated deployment of personnel through the CONUS Replacement Center (CRC).

(10/05-Present) OE Response and Services at Sites CONUS and OCONUS; USAESC-Huntsville, AL. As Program Manager of this five-year, ID/IQ contract supporting USAESCH by providing munitions response and other munitions-related services at sites CONUS and OCONUS. Responsible for overseeing and closing four of the eleven task orders awarded, including management of CEA in Iraq, site investigations, EE/CAs, evaluations, MEC and other munitions related activities, site security, and UXO removal actions at Savanna Army Depot Activity, Patuxent Research Refuge, and Former Camp Maxey. Providing consultation and direction on contract requirements and related issues, performance cost issues, and review and approval of select deliverables, including weekly and monthly progress and cost reporting.
10/04 to Present) OE Response and Services at Sites CONUS and OCONUS; USAESC-Huntsville, AL. CMC Program Manager responsible for daily task accomplishment, and

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administration of operational issues of this $210M task order for the captured enemy ammunition program including mobilization, transportation, demolition operations and security. Within 60 days of task award, oversaw the deployment of more than 250 UXO specialists, ammunition handlers, security specialists, and medics and associated logistical issues. Currently managing more than 200 TtEC personnel and subcontractors. Act as a single point of contact for the Contracting Officer to address overall management and contracts issues pertaining to the tasks during the life of the contract. Oversee the development and execution of the quality control system, and ensure compliance with all program reporting requirements. Responsible for the management and direction of over 200 multi-national UXO and ammunition handlers, as well as four subcontractors that are responsible for clearing remote sites of munitions/UXO. This Task Order is for an initial 6 months with options for 5 additional 6 month periods. The period of performance and funding can be and have been extended on a monthly basis.

Project Manager 9/01 – Present. Huntsville, Ordnance & Explosives Response at Fort McClellan Contract, Fort McClellan, AL.
Serves as project manager for a Task Order contract for UXO investigation and cleanup at Fort McClellan, Alabama. Fort McClellan is a former US Army Training Doctrine Command Installation closed under the BRAC program. This five year, $50 million contract has twenty-three Task Orders that provides services for Site Characterization (including four EE/CA reports), general management, reconnaissance, ordnance and explosive removal action (clearance to depth and clearance to one foot), development and obtaining approval and explosive sighting plan, obtaining an ATF license for and construction of an explosive storage site, ordnance and explosives scrap management, ordnance and explosive disposal support, and construction support. Responsible for administering and managing all contract Task Orders. Duties include supervising and analyzing project progress including costs and quality control; assuring project activities are consistent with project requirements; and ensuring that governmental regulations are enforced. All but 4 Task Orders have been closed.

Served as Task Order Manager for General Management (Task Orders 0013, 0017, & 0023) and Technical Support (Task Order 0014). The General Management Task Order was a FFP Task Order that provided Project Management efforts, administrative support, and office facilities for the site. Task Order 0014, Technical Support, was a combination FFP and T& M Task Order that provided base-wide programmatic administrative support for meetings, presentations, and GIS Support efforts not involving specific Task Orders.

Served as the Task Order Manager for General Management, Technical Support and Ordnance and Explosive (OE) Disposal Support (Task Order 0021 & 0023). Also served as the Task Order Manager for General Site Support and Unexploded Ordnance Clearance for the Choccolocco Area US Fish and Wildlife Land Transfer (Task Order 20), a highly visible project for a clearance to depth of firebreaks, roads, trails and high use areas in the newly formed Mountain Longleaf Refuge. Task Order 20 involved the use of a vehicle-towed array to expedite geophysical mapping of the firebreaks, roads and trails. Additionally, provides mentoring, training, and support for future Project Managers.

In regards to Small Business goals and performance, Mr. Holcomb mended strained relationships with team subcontractors, set aside more SB awards for surveying and brush clearance, and cut down on large business awards. Mr. Holcomb was also instrumental for increasing the productivity and quality of outputs for the Ft. McClellan fieldwork. Driven by safety, USAESCH only allows 40-hour work-weeks for UXO activities, with a minimum 48 hours of rest. Mr. Holcomb and his team evaluated the viability of 50 hour work-weeks, based on health and safety statistics. The 50-hour workweek would include paid overtime, followed by 48 hours of rest. By increasing productivity, reducing the duration of the project,

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renting equipment for shorter durations, and spending less on per diem rates, Mr. Holcomb and his team were able to provide USAESC with a 10% overall cost savings, even with the employee overtime.

Program Manager, 3/95 – 3/01. US Navy, Naval Facilities Engineering Command, Northern Division, Remedial Action Contract (RAC).
Managed a 5-year, $250M, CPAF, multi-state, multi-contaminant, Navy RAC Program. Directed 72 CTOs with over 300 projects, with as many as 30 concurrent CTOs, ranging in value from $50K to $20M and lasting from 1 to 54 months. Responsible for overall program performance and customer satisfaction and empowered with complete project decision authority. Worked with customer counterparts to define all aspects of the requirements and delivery designed results. Monitored and controlled project budgets and schedules, and reviewed daily QC and H&S reports to ensure that project work was done in a safe manner, and was consistent with contract specifications and federal and state regulations. *Effective resource management and innovative approaches and technologies resulted in cost savings of over $10M, and completion of 7 CTOs ahead of schedule with all others on schedule. Successfully negotiated favorable agreements with state and local regulators including using soils below action levels as backfill. Exceeded SB goals of 65 percent through proactive set-aside procurements, outreach programs, and use of Mentor-Protégé firms.*

Assigned, managed and directed the efforts of nearly 200 staff and over 100 subcontractors at program peak. CTOs included removal actions, emergency and expedited response, pilot scale testing, and facility O&M at sites such as tank farms, landfills, reserve centers, engineering centers, depots, bombing ranges, and BRAC sites. Ensured projects were performed in accordance with federal and state regulations including CERCLA, RCRA, TSCA, CAA, CWA, and EPA. Managed a cost-effective and responsive PMO funded as a separate CTO. Maintained frequent communications with the Navy KO/COTR for all program issues and with the ROICC and RPMs on 11 CTOs he was personally managing.

Tasks include excavation/tank removal fuel pump installation, lead paint removal, lead contaminated soil removal from a pistol range, bank stabilization, and dry dock remediation at the Navy Shipyard; design and construction of drinking water treatment plant at a remote location; excavation and removal of PCB-contaminated soils; design and construction of a 600,000 gallon number 6 fuel oil storage tank facility; installation/operation/closure of groundwater treatment systems; removal/demolition/disposal of above and underground storage tanks and structures; building lead paint and asbestos abatement; free-product recovery and thermal desorption pilot studies; building demolition; UXO removal from a remote island; landfill excavation and removal; and landfill design/build tasks. Some of the larger, multitasked sites include:

CTO #2 at the Navy Ship Yard in Philadelphia, PA ($6.4M) to perform removal actions involving PCB sludge, lead, petroleum, ash, LNAPL, asbestos, demolition of a fuel tank farm, and USTs;

CTO #13 at Tank Farm #4 and #5 in Newport, RI ($19M) for oil, sludge, and pipe/asbestos removal, UST closure and tank repairs, fuel oil and free-products removal, demolition of 23 2.5 million-gallon USTs; design and construction of a 600,000-gallon fuel oil storage tank and truck off loading station (CTO 27), converting oil-fired boilers to natural gas (CTOs 23 and 32); and

CTOs #19 ($3.3 million) and #24 ($4.6M) for landfill remediation services at the McAllister Point Landfill, RI and Area A Landfill, New London, CT, respectively, involving VOCs, BNAs, PAHs, PCBs, inorganic compounds, metals, and unmarked drums and tanks.

Implemented and directed the lead paint and asbestos abatement activities for transfer of two housing facilities to the town of Quincy. Additionally, directed remediation activities related to BRAC closures at

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facilities such as Philadelphia Naval Shipyard, South Weymouth NAS, Warminster Naval Warfare Center, Naval Station New York, Naval Undersea Warfare Center New London, and Trenton NWC.

As a CTO Manager, managed the cleaning, demolition, and closure of Tank Farms #4 and #5 NETC, Newport, and implemented innovative approaches using a remote-controlled hydraulic pressure washing system to reduce worker risk. Also, implemented an implosion demolition technique rather than traditional mechanical methods to reduce worker risk and expedite closure schedules. Worked closely with the EPA and Rhode Island Department of Environmental Management (DEM) to achieve buy-in to remedial action approach and obtain the necessary permits for work production. Retrieved and disposed of over one million gallons of fuel oil and 220,000 gallons of sludge from 12 tanks for off site processing and disposal. Also treated over 30 million gallons of process water to limits acceptable for discharge.

This contract was closed in February 2002 with the performance on 47 CTOs rated as Outstanding and 18 rated as above average. This was the first Cost Plus Contract closed by the Navy.

Program Manager, 3/00 - 3/02. US Navy, Naval Facilities Engineering Command, Northern Division, Remedial Action Contract (RAC).
Responsible for a 5 year, $125 million cost plus award fee (CPAF) program, providing remedial actions at environmentally contaminated sites predominately located at Department of Navy and Marine Corps installations and other government facilities. Sites are generally located in the Northeastern United States. For the 73 tasks orders awarded, services include lead paint abatement for historical sites; landfill closure activities; design and build landfill caps; UST closures; dredging and disposal of contaminated sediments; UXO removal; bank stabilization; closure of hydraulic lift pits; design/build passive reactive wall for ground water treatment; repair retention basin and road culverts; asbestos abatement; landfill excavation and disposal; O&M of treatment plants and landfill caps; debris removal; sampling and analysis of marine environments; restoration of aircraft crash site; various soil removals; and UST installation.

Responsibilities as Program Manager include administering and managing all contract delivery orders for remedial action, construction, and services. Duties include overseeing and controlling project progress including costs and quality control, assuring the project is consistent with contract requirements, and ensuring that governmental regulations are enforced. In addition, as Task Order Manager for CTO 17 (lead paint abatement of historical buildings), was responsible for the day-to-day operations at these sites as well as the financial success of this individual CTO. Concurrently responsible for a five-year, $250 million cost plus award fee (CPAF) program, providing remedial actions at environmentally contaminated sites predominately located at Department of Navy and Marine Corps installations and other government agencies.

Program Manager, 1993 – 1995. U.S. Navy, Naval Construction Battalion Center, Remedial Action Contract (RAC), Port Hueneme, CA.
A nationwide RAC with the U.S. Navy's Construction Battalion Center. The contract, valued at $25 million, is a cost plus fixed fee (CPFF) Indefinite Delivery Order program for the remediation of hazardous waste sites at Navy and Marine Corps installations where the predominant contaminants are acids, metals, and/or bases. The contract was designed to utilize innovative and proven technologies for the cleanup of contaminated soils and groundwater. Other services included performing community relations support; pilot studies; design, construction, and O&M or treatment plants; and constructability reviews. As project manager on this cost reimbursable delivery order, Mr. Holcomb directs and ensures timely completion of all aspects of the remedial action to meet deadlines contained in federal and state regulatory compliance orders. His duties have included estimating and negotiating delivery order costs, selecting and assigning personnel, managing and controlling cost and schedule, and ensuring the highest quality work. The tasks under this contract included capping of PCB-contaminated soils, closure of a former electroplating facility, installation and testing of an LNAPL recovery system, delineation and

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disposal of contaminated soil from a fuel disposal trench, and decontamination and demolition of an industrial wastewater treatment plant. Also served as the Project Manager for a delivery order under this contract for the decontamination and demolition of a former plating shop at the Naval Air Station in Jacksonville, FL.

Identified cost savings to the client of over $2.5M on three separate tasks. For example, at the industrial waste treatment plan, Mr. Holcomb identified a specialty subcontractor with a proprietary method of scouring pipes that eliminated the need for disturbing major roadways and installation of 11 retrieval points for the cleaning equipment. This resulted in a 10% savings to the government when compared to conventional systems.

Director of Programs, 1994-1995, Major Contracts in the Eastern U.S. Provided oversight to the program managers of major contracts ($2M or greater) in the eastern U.S. He was responsible for oversight and review of $200M in contracts with government and commercial clients. Contracts were for work in all states in the SAD area inclu ding Puerto Rico.

Project Manager, 1990-1992,Contract DACA87-89-D-0022, US Army Corps of Engineers, Huntsville Division, Responsible for interim remedial design of a fuel-contaminated site at a Defense Fuel Supply Center. *This project was completed in full compliance with federal and state requirements.* Remedies included interceptor trenches, oil-water separator systems, and an air stripper. The process water was treated to non-potable irrigation water standards and released on site. *This task order received an overall rating of outstanding and we received a letter of appreciation from the Commanding Officer of the Corps of Engineers' Division for outstanding contributions.*

Project Engineer/Certified Industrial Hygienist, 1990-1992, US Army Corps Of Engineers, Huntsville Division, Title I and Title II A-E Services for Environmental Services Under DERP. Served as the lead engineer for the performance of an archive search related to chemical warfare agent test and other military activities in the US Virgin Islands. Records in the National Archives, the Chemical Research, Development and Engineering Center, the Army Chemical Center and School, the Army Center of Military History and local newspaper and real estate archives in the US Virgin Islands were reviewed. Twenty-four former installations were identified and the potential for unexploded ordnance contamination was assessed. A site on Water Island was identified where testing and disposal activities were conducted. A separated delivery order was issued to design a UXO/OEW cleanup at the former Ft. Segarra , Water Island, St Thomas, US Virgin Islands. Mr. Holcomb severed as the project engineer and Certified Industrial Hygienist for this task order. This task required the development of large-scale planimetric maps of Water Island showing all roads, utilities, and other terrain features. Topographic maps of the identified test areas and the landfill reported used for disposal were developed. A fence was placed around the potentially contaminated areas for security until the removal could be executed. *Mr. Holcomb developed lesson plans and presented the 40-hour Hazardous Waste Management Training required by 29 CFR 1910.120 Hazardous Waste Management and Emergency Response to local works installing the fence.*

Program Manager, 1991-1995, US Army Corps of Engineers, Mobile District, Indefinite Delivery Order Contract for A/E Services to Perform Environmental Studies and Contamination Site Investigations.
Concurrently served as the Program Manager on an indefinite delivery order contract for HTRW services for the Mobile District, U.S. Army Corps of Engineers. This contract is valued at $10 million and involves 24 individual delivery orders and requires the coordination of over a dozen subcontractors. Additionally, served as Project Manager for five task orders under this contract. Two delivery orders for the preparation of SPCC plans, OPPOMs, and FRPs for defense fuel support points under the direction of the Defense Fuel Supply Center. *Development of these was in accordance with federal, state and local*

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regulations and required extensive coordination with the USEPA, the USCG, the California Department of Fish and Game, and the California Lands Commission.

Coordination with numerous regulatory and public agencies was accomplished. Two Delivery Orders to support the Project Manager for Nuclear Munitions (PMNUC). These tasks required the development of screening criteria for the disposal of non-nuclear material associated with the PM-NUC program and the preparation of two EAs, one of which was classified. An Environmental Assessment for the demilitarization and elimination of Lance Missiles. This Delivery Order included a test firing of the missiles at Redstone Arsenal and the development of a sampling and analysis program including air and water samples.

As Project Manager for an Environmental Assessment for the demilitarization and elimination of Lance Missiles, he directed a sampling and analysis program of air and water samples and a wetlands survey to collect supporting information prior to submitting a draft EA. A separate EA for the test firing was developed. *Mr. Holcomb recently completed the preparation of SPCC plans and SCPs for three defense fuel support points and oil-pollution prevention plans for two defense fuel supply centers in California. The plans were coordinated with numerous regulatory and public agencies and were completed in full compliance with federal and state requirements.*

Program Manager; Dec 1993- Sep 1995: Subcontract to BCM for Indefinite Delivery Order Contract for A/E Services to Perform Environmental Studies and/or Contamination Site Investigations for the DOD, US Army Corps of Engineers, Mobile District
Concurrently served as the Program Manager on an indefinite delivery order contract for A-E services as a Subcontractor to BCM for the Mobile District, U.S. Army Corps of Engineers. Tasks executed under this contract required the development of 10 pollution prevention plans for the Defense Fuels Support Center at five Defense Fuel Supply Points in California. Plans included Facility Response Plans, Marine Transportation Related Facility Response Plans, Oil Pollution Prevention and Operations Manuals, Spill Prevention, Control, and Countermeasures Plans and Response Plans for On-Shore Pipelines. Development of these was in accordance with federal, state and local regulations and required extensive coordination with the USEPA, the USCG, the California Department of Fish and Game, and the California Lands Commission.

Regional Health and Safety Manager, 11/90-01/93, Southeastern US.
Assignment required visits to HTRW sites in the region to ensure proper implementation of Health and Safety procedures in compliance with federal, state, local, company, and client requirements. Developed an Ordnance Program Health and Safety Plan, which established corporate policies and procedures for use during ordnance contamination investigations and remediation. Supervised the preparation of numerous health and safety plans and provided final approval of these plans in Region 2. Provided technical support and guidance to all projects in the regions that include hazardous waste and ordnance investigation and remediation projects. Also assisted at complex sites outside the southeast region, including the Bridgeport Rental and Oil Services (BROS) NPL Site in New Jersey.

PREVIOUS EXPERIENCE

Senior Industrial Hygienist, October 1989-September 1990, Bechtel Construction Company, Oak Ridge, TN.
Provided Health and Safety support to multiple Bechtel projects. -Developed and implemented Health and Safety procedures and plans for the Alternative Remedial Contract Strategies (ARCS) IV Program and the Remedial Design for the Montclair, New Jersey NPL site. Developed lesson plans and presented various sections of the 40-hour and 24-hour Hazardous Waste Management Training required by 29 CFR 1910-120, Hazardous Waste Management and Emergency Response.

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Huntsville Division, U.S. Army Corps of Engineers, September 1985-October 1988, Various Assignments.
Defense Environmental Restoration Program. *Developed and maintained an inventory of over 7,000 former DOD sites including former hazardous waste and ordnance disposal sites.* This involved directing the efforts of both in-house and contractor personnel in preparation, review, and submission of Findings and Determinations of Eligibility for the DOD formerly-owned sites program. Allocated personnel and funding to former sites following DoD "worst first" guidance and directed the effort to develop a DoD hazard ranking system form for OEW sites. *The budget for this activity grew from $12.4M in FY84 based on 500 FUDS to $129M in FY85 based on the increase to 7,000 FUDS.*

Project Manager, Medical Facilities Program. Planned, initiated, directed, and monitored technical and administrative efforts in support of the medical facilities program. Responsible for the procurement and integration of major medical equipment during construction of medical facilities worldwide, this included the purchase and installation of 12 MRI units with all ancillary equipment and support facilities. Initiated and supervised the implementation of the Operational Maintenance Engineering Enhancement Program for medical facilities. This program provided for the operation and maintenance of medical facilities for the first two years of operation by the construction contractor.

Project Manager Asbestos Hazard Emergency Response Act Compliance for DOD Section 6 Schools. He developed and managed in-house and contract personnel in the preparation of asbestos management plans for 55 Department of Defense schools within the Continental U.S. and Puerto Rico. The effort included on-site inspections of all schools, preparation of current contamination and management plans.

Senior DOD UXO/EOD Representative, Emergency Response Action, Medley Bemps, ME. Supervised the on-site detonation of 22 compressed gas cylinders containing shock sensitive aged ethylene trioxide. Prepared work plans and health and safety plans. This high-visibility project required the daily evacuation of the residents of a small community over a period of two weeks.

Project Engineer, Defense Depot, Ogden, UT. Served as the project engineer to locate and remove chemical munitions identification kits buried on-site. He directed the effort to interpret data from a geophysical survey and investigated anomalies. The team discovered and removed over 100 chemical agent identification kits. When dilute agent was detected, personnel upgraded PPE to Level A. Work was performed at night to prevent heat stress. Coordinated to obtain services of the Tech Escort Unit and provided technical oversight for CWM removal and disposal.

Technical Lead Tierra Santa UXO Project. On another potentially controversial project, Mr. Holcomb served as project engineer for the Tierra Santa project in California. In this assignment he supervised the technical aspects of a feasibility study and an environmental impact statement for an ordnance clearance project at a Formerly Used Defense Site. Due to the proximity of the site to residential areas, this project required great sensitivity to the concerns of the local populace. Additionally, coordinated support of military units to conduct investigation/remedial actions at a variety of sites contaminated with hazardous waste and unexploded ordnance.

Senior Industrial Hygienist, November 1985-August 1988, U.S. Army Corps of Engineers, Huntsville District. Directed Occupational Health and Industrial Hygiene Programs for in-house personnel. Evaluated OSHA compliance for all environmental remediation programs managed by the Huntsville Division. Duties included review, guidance, and direction for environmental remediation surveys, handling and storage of hazardous and toxic wastes and chemical munitions, personnel protection measures, pollution control measures and compliance with state and federal regulations.

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Additionally, developed and managed four contracts for hazardous waste management training for all Corps of Engineer personnel throughout the U.S.

August 1983-July 1984, 5th Preventive Medicine Unit, Korea.
Served as the Officer in Charge of an environmental engineer detachment and occupational safety and health consultant to the Surgeon, 8th Army and U.S. Forces Korea. Provided Technical/Managerial oversight for implementation of all environmental health programs for the northern portion of South Korea. These included programs for drinking water quality, waste water treatment, and solid waste disposal. Additionally, directed the implementation of all OSHA compliance and industrial hygiene programs at over 60 military installations throughout South Korea. As consultant to the surgeon, reviewed plans and specifications to ensure compliance with OSHA regulations and NFPA codes.

Senior Project Officer, Industrial Hygiene Division, June 1977-December 1981. U.S. Army Environmental Hygiene Agency. Planned, directed and conducted health hazard assessments and industrial hygiene program consultations at DOD installations throughout the continental U.S. Trained, directed and evaluated junior project officers during conduct of health hazard assessments. Reviewed technical documents and regulations prepared by other industrial hygienists.

PUBLICATIONS & PRESENTATIONS

Rose and Perkins, editors. Holcomb, A.B. and Perkins, J.L. Chapter 4 Case Studies in Industrial Hygiene. Wiley & Sons. 1987.

PROFESSIONAL ACCOMPLISHMENTS

PROFESSIONAL AFFILIATIONS

Society of American Military Engineers, (SAME), Member, 2002
Member, National Council of Examiners for Engineering and Surveying

DISCIPLINE CODES

12 Civil Engineer, N
16 Construction Manager, Y
23 Environmental Engineer, N
36 Industrial Hygienist, N

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Vice President

SKILL SET

BIOLOGICAL SCIENCES
Environmental Engineering
Project Management

TECHNICAL EXPERTISE

LANGUAGE SKILLS

Knowledge Level:

PROFESSIONAL REFERENCES

RELATED COMPANY INFORMATION

Payroll Number: 11631
Employment Status: Full
Preferred First Name: Art
Office Location: Huntsville
Hire Date: 9/4/90
Years with Other Firms: 14
Years with Current Firm: 15
Total Years Experience: 29
Supervisor: John DeFeis, VP, Remediation Operations and Project Services
Office Phone: (256) 430-3701
Cell Phone: (770) 331-4195
Fax: (256) 830-1991
E-mail Address: aholcomb@ttfwi.com
Other E-mail Address (if any):
Resume Last Revised: 4/1/2005

Grady Bendel
Site Safety/QC Manager/SUXOS

EXPERIENCE SUMMARY

Over eighteen years combined military and civilian EOD/UXO experience in the location, identification, render safe and disposal of conventional, nuclear, chemical weapons and improvised explosive devices. Four of those years were at the Department of Defense, U. S. Naval Diving and Salvage Training Center, Panama City, Florida serving as the Director of the Curriculum and Instructional Standards Office and a certified "High Risk" instructor.

Proven performance in the UXO operations management, planning, and administration. Extensive knowledge and experience in UXO clearance operations, quality control programs, health and safety programs, and explosive safety programs. Responsible for the management of all site activities and personnel, ensuring all site work is performed in accordance with the Site Wide Work Plan and the Site Specific Work Plans.

EDUCATION

Diploma, Explosive Ordnance Disposal Training, NAVSCOLEOD, Indian Head, MD, 1986

REGISTRATIONS/CERTIFICATIONS

ILLINOIS Explosive License, Date of Issue: 09/22/07, Expiration: 09/22/10

TRAINING

OSHA 8 Hour Refresher Course (current)
OSHA 10 Hour Refresher Course Construction Safety and Health (08/08)
OSHA Supervisor Training, Santa Ana, CA (09/02)
Environmental & Safety Supervisor Course, Santa Ana, CA (09/02)
OSHA Construction Safety & Health, Santa Ana, CA (09/02)
Army Corps of Engineers Quality Control School, Mobile, AL (06/01)
OSHA 40 Hour HAZWOPER, El Paso, TX (01/98)
Curriculum Development Training, Panama City, FL (11/93)
US Navy Instructor Training, Pensacola, FL (05/93)
US Navy EOD School, Indian Head, MD (12/86)

CORPORATION PROJECT EXPERIENCE

Project UXO Specialist, July 2008 – September 2008
Naval Weapon Station (NWS) Concord, Landfill Site #1, Concord Ca. Responsible for providing and maintaining an effective UXO Awareness and UXO Safety for all project tasks. Providing briefings to Site personnel and Visitors on UXO recognition, response and reporting. Observe operations ensuring conformance with UXO guidelines procedures. Make recommendations of improvements as necessary. Ensure the awareness of site personnel of the day to day operations that affect UXO Safety. And function as a liaison with Client and subcontractor's personnel on UXO Awareness and Safety.

Project UXO Site Safety Manager/Quality Control Specialist, June 2008
Naval Weapon Station (NWS) Concord, Landfill Site #1, Concord Ca. Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Grady Bendel
Site Safety/QC Manager/SUXOS

Project UXO Site Manager/SUXOS, October 2007 – November 2007
U.S. Army Corps of Engineers, Ordnance and Explosive Response MEC for Removal Action at Savanna Army Depot of Savanna IL. Responsibilities are for the management, planning and administration of the contract. In charge of the management of all site activities and personnel, ensuring all site work is performed in accordance with the Site Wide Work Plan and the Site Specific Work Plans. Maintaining awareness for safety issues and checking quality of work being preformed to detect changes and contract adherence.

Project UXO Site Quality Control Specialist, May 2007 – June 2007
U.S. Army Corps of Engineers, Ordnance and Explosive Response MEC for Removal Action at Savanna Army Depot of Savanna IL. Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and its subcontractors, project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Project UXO Site Safety Manager/Quality Control Specialist, February 2007 – April 2007
U.S. Navy Munitions and Explosives of Concern Verification and Clearance at NASA Flight Facility Crows Landing, Crows Landing California Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and its subcontractors, project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Project UXO Site Quality Control Specialist, September 2006 – October 2006
U.S. Army Corps of Engineers, Ordnance and Explosive Response MEC for Time Critical Removal Action at Savanna Army Depot of Savanna IL. Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and its subcontractors, project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Project UXO Site Safety Manager/Quality Control Specialist, June 2006 – August 2006
U.S. Navy, Ordnance and Explosive Response MEC Removal of Dredge Material/Survey, Naval Weapon Station Earle Waterfront Complex, Leonardo, New Jersey Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and its subcontractors, project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Project UXO Site Safety Manager/Quality Control Specialist, January 2006 – April 2006

Grady Bendel
Site Safety/QC Manager/SUXOS

U.S. Army Corps of Engineers, Ordnance and Explosive Response MEC Removal Bains Gap Road at Fort McClellan, Alabama Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and its subcontractors, project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Project UXO Site Safety Manager/Quality Control Specialist, May 2005 – August 2005
U.S. Army Corps of Engineers, Ordnance and Explosive Response at Fort McClellan, Alabama
Responsible for providing and maintaining an effective safety program and adherence at all levels. As Site Quality Control Specialist ensured that quality control system for all project tasks met the requirements of the client. Preformed QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, project activities to ensure compliance with established standards and procedures. Over seeing awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

Project UXO Site Safety Manager/Quality Control Specialist, March 2005 – May 2005
Florida Power & Light, Horse Hollow Wind Farm, Taylor County, TX
Responsible for providing and maintaining an effective safety program and adherence at all levels. Assist client Site Safety Specialist providing him with required reports and briefings for site personnel. As Site Quality Control Specialist ensured that quality control system for all project tasks met the requirements of the client. Preformed QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, project activities to ensure compliance with established standards and procedures. Over seeing awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and contractor's quality personnel.

Project UXO Site Manager/SUXOS, August 2004 – February 2005
U.S. Army Corps of Engineers, Ordnance and Explosive Response at Fort McClellan, Alabama
Responsibilities are for the management, planning and administration of the contract. In charge of the management of all site activities and personnel, ensuring all site work is performed in accordance with the Site Wide Work Plan and the Site Specific Work Plans. Maintaining awareness for safety issues and checking quality of work being preformed to detect changes and contract adherence.

Project UXO Quality Control Specialist, July 2003 – August 2004
U.S. Army Corps of Engineers, Ordnance and Explosive Response at Fort McClellan, Alabama
Responsible for providing and maintaining an effective quality control system for all project tasks. Monitoring QC activities to ensure conformance with authorized policies, procedures, and recommending improvements as necessary. Performing readiness reviews, inspections and surveillances of TTECI's, and its subcontractors, project activities to ensure compliance with established standards and procedures. Maintaining awareness of the entire project to detect conditions that may be adverse to quality. And function as a liaison with Client and subcontractor's quality personnel.

UXO Specialist III/Demolition Supervisor, March 2001 - July 2003
U.S. Army Corps of Engineers, Ordnance and Explosive Response at Fort McClellan, Alabama

PREVIOUS EXPERIENCE

UXO Specialist II and UXO Specialist III, July 2000 – March 2001

Grady Bendel
Site Safety/QC Manager/SUXOS

EODT, Fort McClellan, Alabama
UXO Specialist III and Health & Safety Officer, May 2000
The Parsons Corporation, Camp Butner, North Carolina
Site Visit

UXO Specialist III and Health & Safety Officer, April 2000
The Parsons Corporation, Burgstrom AFB, Austin, Texas
Site Visit

UXO Specialist III, March 2000 - April 2000
The Parsons Corporation, Camp Stanley, San Antonio, Texas, Escort for Avoidance
UXO Specialist II, September 1998 – February 1999
HFA/IITRA, Camp Elliot, San Diego, California
Surface Clearance

UXO Specialist II, January 1998 – March 1998
EODT, McGregor Range, El Paso, Texas
Range Survey

Instructor, April 1993 – February 1997
US Naval Diving and Salvage Training Center, Panama City, Florida
Instructor Duty. Instructed EOD Diver Course, MK-16 Diving Course, Underwater Demolition and Marine Combat Swimmer Course. Qualified as Bends Supervisor.

COMEODGRU ONE NAB, January 1990 – April 1993
Coronado, California
Operation Department in charge of EOD Publications, documents, and intelligence. Assistant Security Officer. Graded readiness exercises, which evaluated units' readiness to perform assigned missions. Enlisted Watch Bill Coordinator

Diving Supervisor, December 1986 – January 1990
EODMU THREE, San Diego, California
Diving Supervisor, Demolition Supervisor, Mammal Handler. Worked on range clearance at San Clemente Island to include various projectiles up to 16" MK 80 series bombs, mortars, pay loads bombs, flares and fuzes. January 1990 – June 1990, deployed USS Pelilau LHA 5 Det 51, disposing of over 17,000 lbs of various explosive to include HE projectiles, WP projectiles, flares, fuzes, 80 series bombs, smokeless powder, mortars, and retrograde munitions at

DISCIPLINE CODES

24 Environmental Scientist, N
51 Safety/Occupational Health Engineer, N
50 Risk Assessor, N
54 Security Specialist, N
38 Land Surveyor, N
Training Personnel, N
UXO Certified Specialist (EOD), Y

SKILL SET

Air Quality Permitting
Regulatory Compliance
Stack Testing

Grady Bendel
Site Safety/QC Manager/SUXOS

Environmental Assessments
Environmental Engineering
Environmental Permitting
Erosion Control
Field Sampling
Groundwater Sampling

PROFESSIONAL REFERENCES

Art Holcomb, Program Manager, Tetra Tech EC, Inc., (256) 820-7904, Art.Holcomb@tteci.com
Michelle Mazza, Task Order Manager, Tetra Tech EC, Inc., (973) 630-8000, Michelle.Mazza @tteci.com
Jim Cocchiola Site Manager, Tetra Tech EC, Inc., (425) 381-1588, Jim.Cocchiola @tteci.com

RELATED COMPANY INFORMATION

Payroll Number: 502572
Employment Status: P-7
Preferred First Name: Grady
Office Location: Savanna IL,
Hire Date: 3/5/01
Years with Other Firms: 2
Years with Current Firm: 6
Total Years Experience: 17
Supervisor: David Keller, UXO Vice President, Donald Wayne Welch, Jr., UXO Program Quality Manager/Project Manager Michelle Mazza
Office Phone: (815) 273-4105
Cell Phone:
Fax: (815) 273-4118
E-mail Address: Grady.Bendel@tteci.com
Other E-mail Address (if any): EODLINK@aol.com
Resume Last Revised: 10/09/2007

Mr. Michael H. McGuire
Senior Geophysicist

EXPERIENCE SUMMARY

More than 22 years experience as a geophysicist including data collection, processing, interpretation, and mapping of seismic data, time and frequency domain electromagnetic (EMI) data, magnetic data, ground penetrating radar (GPR) data, resistivity data, and management of geophysical field crews. Currently the company resource manager for geophysics.

Extensive experience related to detection and mapping of Unexploded Ordnance (UXO). Involved with the design and implementation of over 30 UXO investigations throughout the U.S. Instrumental in establishing and developing Tetra Tech's UXO program capabilities including the development of geophysical standard operating procedures, geophysical software development, instrument development in conjunction with product manufacturers, and survey platform design. Responsible for the integration of state of the art DGPS, Robotic Total Station, and Constellation positioning systems with geophysical instruments.

EDUCATION

BS, Geophysical Engineering, Colorado School of Mines, 1981

REGISTRATIONS/CERTIFICATIONS

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training - 1989
8-Hour OSHA Health and Safety Supervisor Training - Current
8-Hour OSHA Hazardous Waste Health and Safety Refresher - Current/First Aid - Current
SAGEEP - 1990
720-Hour Amoco Geologic and Geophysical Training - 1986

CORPORATION PROJECT EXPERIENCE

Project Geophysicist, February 2007-Present
CEHNC, Cantonment Area Ft Sill, UXO Survey, Ft Sill, OK
Responsible for the geophysical program design, data acquisition, processing, and interpretation of approximately 230 acre survey. Survey is currently being used to locate, identify, and remove ordnance as small as MKII grenades. Incorporated 5 EM61 coil vehicle-towed-array (VTA) that averaged over 10-acres/day production

Project Geophysicist, February 2006-April 2006
CEHNC, Bains Gap Road Ft McClellan, UXO Survey, Ft McClellan, AL
Responsible for the geophysical program design, data acquisition, processing, and interpretation of approximately 20 acre survey. Survey is currently being used to locate, identify, and remove ordnance as small as 37mm projectiles. Incorporated Robotic Total Station and Constellation positioning systems.

Project Geophysicist, November 1998 – Present
CEHNC, Savanna Army Depot, UXO Survey, Savanna, IL
Manage geophysical projects at the former depot. Responsible for test design and evaluation of geophysical data for the determination of the optimum methodology used for the EE/CA. Duties included planting inert UXO for test, data acquisition, processing and interpretation for evaluation of instrumentation capabilities, survey techniques, interpretation software, and discrimination of UXO. Geophysical survey included the data collection, processing, and discriminatory interpretation of 316 grids at the site during the first project. Subsequent projects included the survey of over 40 miles of transect data and OB/OD area surveys.

Mr. Michael H. McGuire
Senior Geophysicist

Geophysicist, August 2002 - Present
U.S. Army, Rocky Mountain Arsenal, UXO Survey, Denver, CO
Responsible for the geophysical program design, data acquisition, processing, and interpretation of approximately 1000 acre survey. Survey is currently being used to locate, identify, and remove ordnance. Incorporated 5 EM61 coil vehicle-towed-array (VTA) that averaged over 10-acres/day production

Geophysicist, March 2005 – February 2006
FPL Energy, Horse Hollow Wind Farm, UXO Survey, Abilene, TX
Responsible for the geophysical processing and interpretation of approximately 300 acre survey. Survey was used to locate, identify, and remove ordnance for the purpose of installing windmill platforms. Incorporated 5 EM61 coil vehicle-towed-array (VTA) that averaged over 10-acres/day production

Project Geophysicist, July 2002-June 2003
USHOMES, Former Lowry Bombing Range, UXO Survey, Aurora, CO
Responsible for the geophysical program design, data acquisition, processing, and interpretation of approximately 1000 acre survey. Survey was used to locate, identify, and remove ordnance as small as 20mm projectiles. Incorporated vehicle-towed-array (VTA) that averaged over 10-acres/day production.

Lead Geophysicist, January 2002-Present
CEHNC, Patuxent Research Refuge, Ft. Meade, UXO Survey, Laurel, MD
Managed geophysical project at the refuge, North Tract. Responsible for test design and evaluation of geophysical data for the determination of the optimum methodology used for the removal of UXO. Duties included planting inert UXO for test, data acquisition, processing and interpretation for evaluation of instrumentation capabilities, survey techniques, interpretation software, and discrimination of UXO. Geophysical survey included the data collection, processing, and discriminatory interpretation of over 200 acres at the site. Survey is was used to locate, identify, and remove ordnance as small as 20mm projectiles. Incorporated vehicle-towed-array (VTA) that averaged over 10-acres/day production.

Project Geophysicist, July 1999-June 2002
CEHNC, Ft McClellan, UXO Survey, Ft McClellan, AL
Acquired, processed, and interpreted geophysical data at a test site as part of a proposal which resulted in a 5 year, $50 million dollar award for UXO clean up at the site. Currently responsible for the processing and interpretation of EMI data collected at site.

January 1997-October 2003
Navy RAC, Adak Naval Air Station, UXO Survey, Adak, AK
Designed, planned, and implemented four large UXO surveys at Adak Naval Air Station. Duties included task management, procurement, training, data acquisition, data processing, data interpretation, software design, and surveying.

Lead Geophysicist, January 1999-June 2003
USCOE Baltimore, Edgewood Area, UXO Survey, Aberdeen Proving Ground, MD
Currently involved in evaluation of existing magnetic geophysical data for identification of potential Chemical Warfare Materials UXO on over 500 acres. Responsible for prioritizing anomalies based on geophysical signature and character in conjunction with intrusive investigation. Interpretation will be utilized to discriminate UXO from non-UXO to reduce intrusive level of effort and associated costs.

September 1998
CEHNC, Ft Dix Mid-State Prison, UXO Survey, Ft Dix, NJ

Mr. Michael H. McGuire
Senior Geophysicist

Interpreted Geonics EM61 data for the identification of potential UXO at the site. Used proprietary software to discriminate UXO from non-UXO.

Lead Geophysicist, February 1998-May 1998
CEHNC, Former Camp Wellfleet, UXO Survey, Cape Cod, MA
Acquired, processed, and interpreted magnetic geophysical data to determine nature and extent of UXO contamination at former army training facility. Evaluated approximately 80 survey grids.

July 1998-Present
Navy RAC, Jackson Park Housing Area, UXO Survey, Bremerton, WA
Designed, planned, and implemented large UXO surveys at Jackson Park Housing area at the Bremerton Naval Facility. Duties include task management, procurement, training, data acquisition, data processing, data interpretation, software design, and surveying. Involved with integrating GPS with geophysical instrumentation.

Lead Geophysicist, October 1996-April 1997
CEHNC, Nansemond Army Depot, UXO Survey, Norfolk, VA
Acquired, processed, and interpreted geophysical data (Magnetic and EMI) to determine nature and extent of UXO contamination at former army depot. First UXO specific survey ever performed by Foster Wheeler Environmental. Pioneered FWENC integration of geophysical and statistical sampling techniques to determine sampling locations for potential UXO.

Lead Geophysicist, September 1995-March 1996
Southwest TERC, Melrose Air Force Range, Canon Air Force Base, New Mexico
Designed and implemented a magnetometer survey to delineate buried waste that included unexploded ordnance (UXO). The information was used to determine borehole locations and for future remedial design.

Geophysicist, June 1994
U.S. Army Corps of Engineers, Morgan Depot, UXO Magnetometer Survey, Sayreville, NJ
Developed a work plan for an unexploded ordnance (UXO) magnetometer survey at the former Morgan Depot in New Jersey. This survey is to be performed for the U.S. Army Corps of Engineers (USACE) in the near future, and will involve data acquisition and interpretation.

Geophysicist, October 1989-March 1995
U.S. Army Toxic and Hazardous Materials Agency, Tooele Army Depot and Dugway Proving Grounds, Utah
Acquired, processed, and interpreted EM and magnetic geophysical data on three separate mobilizations. These geophysical data were used to locate old burial sites, contaminant plumes, and buried metal (potential UXO).

PREVIOUS EXPERIENCE

Project Manager, July 1986-September 1989
Diversified Installations, Inc., Denver, CO
Designed and implemented job costing and purchasing software in dBASE III. Performed cost analyses in preparation for service contract bid submittals. Also managed company personnel while fulfilling service contracts.

Mr. Michael H. McGuire
Senior Geophysicist

Exploration Geophysicist, Senior Grade, February 1982-July 1986
Amoco Production Company, Denver, CO
Designed, implemented, and supervised seismic wave tests and seismic surveys during acquisition of geophysical data in conventional and portable terrain, including more than 400 miles of surface and drilled charges, three-dimensional surveys, and high-resolution vibroseis. Seismic processing work included successful handling of complex geometry and severe near-surface statics associated with the Utah/Wyoming thrust belt, as well as high-resolution processing of Paradox Basin data. Techniques used include refraction statics, geometry corrections, true amplitude and wavelet stabilization, and deconvolution. Also interpreted and mapped various geologic environments and proposed a recommended course of action to management.

Field Engineer, May 1981-September 1981
Group Seven, Inc., Golden, CO
Used electrical and time domain electromagnetic methods in exploration for geothermal fields. Familiar with cryogenic magnetometer and associated electronic equipment.

Assistant Crew Chief, August 1979-August 1980
C.G.G., Denver, CO
Managed 35-person seismic crew in the western United States using Vibroseis, poulter, and shothole sources. Responsible for day-to-day operations including hiring, scheduling, and supervision of crew, quality control of seismic data, payroll and bookkeeping, supplies and equipment maintenance, and client communications.

PUBLICATIONS & PRESENTATIONS

PROFESSIONAL ACCOMPLISHMENTS

22 years of geophysical experience - Involved with the design and implementation of 30 UXO investigations throughout the US Instrumental in establishing and developing Tetra Tech's UXO program capabilities.

PROFESSIONAL AFFILIATIONS

DISCIPLINE CODES

30 Geologist, Y

SKILL SET

GEOSCIENCE

Exploration - Mineralogy
Exploration - Mining
Exploration - Ore Evaluation
Exploration - Petroleum/Gas Fields
Geophysics - Borehole
Geophysics - Electromagnetics
Geophysics - Gravity
Geophysics - Ground Penetrating Radar
Geophysics - Magnetics
Geophysics - Neutron/Gamma
Geophysics - Other
Geophysics - Resistivity
Geophysics - Seismic

Mr. Michael H. McGuire
Senior Geophysicist

TECHNICAL EXPERTISE

Seismic Reflection, UXO.

LANGUAGE SKILLS

Knowledge Level:

PROFESSIONAL REFERENCES

Bob Selfridge, Chief Geophysicist, U.S Army Corps of Engineers, Geotechnical Branch, Huntsville AL
Email: Bob.J.Selfridge@hnd01.usace.army.mil Phone 256 895-1600
Clark Davenport, RGP California. Former Supervisor. Phone 303 232-0636

RELATED COMPANY INFORMATION

Payroll Number: 11511
Employment Status: Full
Preferred First Name: Mike
Office Location: Denver
Hire Date: 11/8/89
Years with Other Firms: 10
Years with Current Firm: 17
Total Years Experience: 27
Supervisor: Gordon Jamieson
Office Phone: (303) 980-3538
Cell Phone: (303) 887-4088
Fax: (303) 980-3539
E-mail Address: Michael.McGuire@tteci.com
Other E-mail Address (if any):
Resume Last Revised: 6/23/2006

Mr. Bradley K. Newlin, PG
Senior Geologist/Geoscientist

EXPERIENCE SUMMARY

Mr. Newlin is a Senior Geoscientist with 20 years of experience in the environmental industry. His experience includes surface geophysical investigations, Phase I environmental site assessments, Phase II design and site characterization, remediation of petroleum impacted sites, hard-rock coring, monitoring well and recovery well design and installation, underground storage tank removal and vadose-zone monitoring projects.

Mr. Newlin has performed a variety of surface geophysical investigations to detect buried metal debris, contaminant plume delineation, bedrock mapping, landfill delineation and mapping of unexploded ordnance (UXO). He has extensive experience in geophysical data collection, processing, interpretation, mapping of time domain and frequency domain electromagnetic and magnetic data.

Mr. Newlin has broad experience with environmental site characterization, including preparation of health and safety plans, quality assurance/quality control plans, sampling and analysis planning, work plans, meetings and negotiations with regulatory agencies, field supervision of key project related issues, scheduling, and reporting.

EDUCATION

BS, Geology, Metropolitan State College of Denver, 1985

REGISTRATIONS/CERTIFICATIONS

Professional Geologist, UT, Number 5357811-2250
Professional Geologist, WA, Number 29940-2279

TRAINING

40-Hour OSHA Hazardous Waste Certification - 1988
Principals and Practices of Project Management - 2002
Department of Transportation Hazmat Training Certification - 2004
30-Hour Construction Safety Certification - 2005
8-Hour OSHA Supervisor Training Certification - 2005
Waste Management Training Certification - 2006
Environmental and Safety Supervisor Certification (ESS) – 2005
Practical Loss Control Leadership/Loss Control Management Certification – 2005
10-Hour Construction and ESS Refresher Training – Current
8-Hour OSHA Hazardous Waste Refresher Certification - Current
American Red Cross First Aid Basics and Adult CPR/AED Training - Current

CORPORATION PROJECT EXPERIENCE

Senior Geoscientist, October 2003
Ft. McClellan UXO Data Processing and Interpretation
Perform geophysical data processing and interpretation of electromagnetic data collected at the Ft. McClellan, AL UXO clean up site.

Senior Geoscientist, October 2003
Savanna Army Depot, UXO Target Reacquisition
Responsible for the reacquisition of interpreted UXO targets using Leica real-time global positioning system (gps) instrumentation at the site prior to the arrival of intrusive dig teams.

Mr. Bradley K. Newlin, PG
Senior Geologist/Geoscientist

Senior Geoscientist, November 2003
Putuxent Research Refuge, Ft. Mead, UXO Survey
Perform geophysical magnetic data collection, processing and interpretation of approximately 100 acre area for inert UXO including planting inert UXO for instrument testing.

Senior Geoscientist, December 2003-January 2004
Standardized UXO Technology Demonstration, Yuma Proving Ground
Perform time domain electromagnetic survey (TDEM) at four separate demonstration areas at the Yuma Proving Ground to demonstrate the effectiveness of personnel and equipment to locate buried metal objects. Responsible for data collection, processing and interpretation of all field data collected at the site.

Senior Geoscientist, April 2004-October 2004
Rocky Mountain Arsenal
Data processing and discriminatory interpretation of approximately 100 acres of TDEM survey data collected within the Balance of Areas (BOA) tract at the Rocky Mountain Arsenal. The data was collected using five (5) EM61 instruments incorporated into a vehicle-towed array (VTA) system that averaged approximately 10-acreas per day production and a man-portable (single) EM61 system for smaller areas.

Senior Geoscientist, January 2004
Seal Beach Naval Weapons Station
Geophysical Lead responsible for data collection, processing, and interpretation of suspect UXO areas. Suspect UXO targets, including a small landfill boundary were subsequently reacquired using Leica gps equipment.

Senior Geoscientist, April 2004-May 2004
U.S. Navy Jackson Park Housing Complex, UXO Site, Bremerton, WA
Data processing and interpretation of TDEM (EM61 MKII) data to determine nature and extent of UXO at the Jackson Park Housing Complex. Positioning systems used included Leica Differential Global Positioning System (DGPS), Leica Robotic Total Station (RTS), and Arcsecond 3Di Constellation that were collected daily by three (3) field crews.

Senior Geoscientist, June 2004-December 2004
Jaite Paper Mill, Cuyahoga Valley National Park, National Park Service, Brecksville, OH
Lead Geologist responsible for the implementation and performance of a Phase II Supplemental Site Investigation at the former Jaite Paper Mill in the Cuyahoga National Park to determine nature and extent of potential contamination associated with historic activities at the site.

Senior Geoscientist, April 2005-May 2005
Lockheed Martin Astronautics, Denver, CO
Lead Geologist responsible for drilling over-sight, logging of recovered hard rock core and recovery well installation within the Glennon Limestone at the Lockheed Martin Astronautics Plant.

Senior Geoscientist, May 2005-Present
Lockheed Test Facility, Beaumont, CA
Field Geophysical Lead responsible for data acquisition, and data interpretation at Lockheed's former ordnance test range near Beaumont, California. Data was acquired using an EM61 MKII instrument with Leica DGPS positioning over 13 large areas to determine the extent of buried UXO items.

Mr. Bradley K. Newlin, PG
Senior Geologist/Geoscientist

2005 - Present
Tri-State Generation and Transmission (various sites)
Perform 10 Phase 1 environmental site assessments for properties in Colorado Kansas as part of acquisition program in advance of new coal-fired generator and transmission corridor construction.

Senior Geoscientist, September 2005 – Present
Marathon Oil Company, Gillette, WY
Responsible for assisting Marathon Oil Company in the screening of water management alternatives, project report management, and feasibility (field) site reconnaissance of proposed water management facilities for their coal-bed methane well production.

2005 - Present
Colorado Department of Transportation (various sites)
Task Manager for 10 task orders including:

- Phase 1 and Phase 2 environmental assessments for several right of way acquisitions;
- Corrective action implementation for hydrocarbon contamination in historic mining district, including characterization, field oversight of soil removal, and disposition of soils impacted by hydrocarbons and heavy metals;
- Manage the cleanup and disposal of a roadway salt spill; and
- Task manager for groundwater monitoring program at numerous facilities.

PREVIOUS EXPERIENCE

Project Geologist, 2001-2003
Harding ESE/MACTEC
Managed petroleum contaminated sites in Ogallala and Alda, Nebraska. Implemented and managed light non-aqueous phase liquid (LNAPL) recovery using remotely operated active skimmer pumps. Managed groundwater monitoring programs for characterization of dissolved-phase constituents. Prepared and implemented Remedial Action Plans (RAPs) for each site.

Project Geologist, 2001-2003
Harding ESE/MACTEC
Manage Phase 1 and Phase II environmental assessments for the Colorado Department of Transportation. Implement and manage Phase II environmental assessments and remediation projects for Unocal, and for the Denver International Airport's environmental office.

Project Geologist, 2000
ARCADIS Geraghty & Miller, Inc.
Supervised and inspected the abatement of asbestos containing building material during the demolition of a large building in northeast Colorado. Was responsible for collecting area and personnel air monitoring samples to monitor for possible exposure to airborne asbestos fibers and lead-based paint dust during demolition activities. Supervised and inspected the abatement of asbestos containing material (in the form of paper and tar wrap that once covered an oil pipeline) along a 250-mile pipeline corridor in northeastern Colorado and western Nebraska.

Project Geologist, 1999
ARCADIS Geraghty & Miller, Inc.
Supervised the installation of passive remediation methods at two CDOT hydrocarbon contaminated sites in Colorado using an Oxygen Release Compound (ORC). The ORC is composed of magnesium peroxide that increases indigenous microbial activity leading to increased natural attenuation of the hydrocarbon in groundwater.

Mr. Bradley K. Newlin, PG
Senior Geologist/Geoscientist

Project Geologist, 1997
ARCADIS Geraghty & Miller, Inc.
Supervised and inspected the installation of two large groundwater recovery trenches at the Lockheed Martin Astronautics Plant near Denver, Colorado. Responsibilities included over-site and supervision of all phases of construction and testing of the recovery system, associated piping, recovery well installation, and construction of infiltration galleries for treated groundwater.

Project Geologist, 1997
ARCADIS Geraghty & Miller, Inc.
Site geologist and field technical representative responsible for the drilling program, including hard rock coring, and water-well design at a Uranium Mill Tailings (UMTRA) site near Tuba City, Arizona. As part of an active community service program was asked by the DOE representative to instruct local Native American students on details of the field investigation and earth science basics.

Staff Geologist, 1996
ARCADIS Geraghty & Miller, Inc.
Conducted electromagnetic conductivity survey over an approximate 30-acre area in Moore, Oklahoma as a litigation support tool to determine potential leaks of saltwater from pipelines. The geophysical instruments used were an EM31 terrain conductivity meter and an EM39 conductivity meter. Data was collected along survey lines spaced approximately 20 feet apart allowing for good spatial resolution of conductive contaminant plumes at the site. The data acquired for this project was legally defensible and subsequently saved the client thousands of dollars over other, more costly, investigative methods.

Staff Geologist, 1996
ARCADIS Geraghty & Miller, Inc.
Installed pressure transducers and performed aquifer pump tests of groundwater as a precursor to a pump and treat system and vapor extraction remediation at two landfill sites in northern California. Suction-cup lysimeters were installed within specific lithologic zones in angle-drilled boreholes beneath each landfill. These lysimeters were placed to monitor the leachate percolation through the vadose-zone above the water table.

Staff Geologist, 1996
ARCADIS Geraghty & Miller, Inc.
Conducted a field vadose zone-monitoring program at the Rocky Flats Industrial Facility located northwest of Denver, Colorado. Specific tasks performed include measurement of in-situ hydraulic conductivity in bedrock clays, shallow infiltration testing to determine in-situ hydraulic conductivity of unconsolidated soils using a Guelph permeameter, installation of suction cup lysimeters for withdrawal of pore-water from the vadose zone, and installation of PVC access tubes for a neutron moderation program utilizing a sealed-source nuclear gauge.

Staff Geologist, 1995
ARCADIS Geraghty & Miller, Inc.
Implemented and supervised the drilling and well installation program at a hazardous waste landfill near Beatty Nevada.

Staff Geologist, 1993
ARCADIS Geraghty & Miller, Inc.
Performed a geophysical survey using a fast-cycling proton precession magnetometer at a landfill site in the Midwest. This instrument allowed for an order of magnitude increase in data acquisition over conventional instruments. The field efficiency considerably reduced the cost of magnetic surveys.

Mr. Bradley K. Newlin, PG
Senior Geologist/Geoscientist

Project Geologist, 1992
ARCADIS Geraghty & Miller, Inc.
Conducted transient electromagnetic soundings near Vega Alta, Puerto Rico. The soundings provided accurate information on the depth to the interface between freshwater and saltwater within the unconfined aquifer.

PUBLICATIONS & PRESENTATIONS

PROFESSIONAL ACCOMPLISHMENTS

20 years of experience as a Geologist on environmental projects
18 years of experience collecting, processing and interpreting surface geophysical data
Expertise in performing Phase I ESA's and Phase II site characterizations
Experience as a Project and Task Manager

PROFESSIONAL AFFILIATIONS

DISCIPLINE CODES

30 Geologist, Y

SKILL SET

Borings and Wells - Geotechnical Borings
Borings and Wells - Monitoring Well Installation
Borings and Wells Recovery Well/Production
Borings and Wells - Soil Classification/Logging
Borings and Wells - Hard Rock Classification
Dense Non Aqueous Phase Liquids
Environmental Monitoring
Environmental Permitting
Geological Mapping
Geophysics-Electromagnetics
Geophysics-Magnetics
Geophysics-Seismic
Geophysics-Ground Penetrating Radar
Groundwater/Surface Water Sampling
Health and Safety
Hydrogeology - Pump Test Analysis
Hydrogeology - Pump Test Performance
Hydrogeology - Slug Test Analysis
Hydrogeology - Slug Test Performance
Hydrogeology - Wellhead Protection
Hydrology - Stream Flow Measurement
In Situ Remediation – Oxygen Release Compound
In Situ Remediation Bioremediation
In Situ Remediation - Biodenitrification
In Situ Remediation – Phyto-remediation
Light Non Aqueous Phase Liquids (LNAPL)
Manufacturing Facilities/Property Transfer
Petroleum Contaminated Sites
Preliminary Assessment/Site Investigation
Quality Assurance
RCRA/CERCLA
Remedial Investigation
Sampling - Water Level Measurements
Soil/Sediment Sampling
Soil Gas Investigations
Site Characterization
Site Closure Plan
Soil Gas Analysis
Underground Storage Tanks
Water Quality Evaluations
Well Installation

TECHNICAL EXPERTISE

Geophysics
Task Manager

Mr. Bradley K. Newlin, PG
Senior Geologist/Geoscientist

LANGUAGE SKILLS

Knowledge Level:

PROFESSIONAL REFERENCES

RELATED COMPANY INFORMATION

Payroll Number: 504561
Employment Status: Full
Preferred First Name: Brad
Office Location: Denver
Hire Date: 8/25/03
Years with Other Firms: 15
Years with Current Firm: 5
Total Years Experience: 20
Supervisor:
Office Phone: (303) 980-3534
Cell Phone: (303) 396-4065
Fax: (303) 980-3539
E-mail Address: brad.newlin@tteci.com
Other E-mail Address (if any):
Resume Last Revised: 2008-10-20

Richard J. Rogaliner
UXO QUALITY CONTROL/SAFETY OFFICER

EXPERIENCE SUMMARY

Over fifteen years of experience as an EOD/UXO Technician. Positions held: SUXOS, Safety/QC Specialist, Tech III-Team Leader, and Tech II-Team Member. Responsibilities have included conducting daily operations in order to facilitate site closures, overseeing all safety and quality control aspects of multiple UXO teams on several sites in Iraq, conducting investigations and developing remediation procedures concerning incidents, tracking all accountable records for many sites on a given project, maintaining all applicable certifications to ensure qualified personnel on sites, being responsible for all training conducted to ensure complete compliance with all company policies, guidelines, and standard operating procedures, and running daily operations.

EDUCATION

Indian Head EOD School, 1990

TRAINING

US Naval School EOD Assistant Course I, Eglin AFB, FL (11/90)
US Naval School EOD Technician Course II, Indian Head, MD (04/91)
US Army School EOD Technician Course III, Redstone Arsenal, AL (05/91)
OSHA 30-Hour Safety Course (08/07)
Quality Control 101 Course (08/02)
Practical Loss Control Leadership Course (03/08)
Preventing Workplace Harassment Supervisor Course (08/08)
OSHA 40-Hour Supervisor Course (07/96)
OSHA 8-Hour Refresher Course (02/06)
Physical (01/08)
First Aid/CPR (03/05)
Heavy Equipment Operator (08/02)
Hazardous Devices Course (08/92)
Hazardous Materials Transportation Course (08/03)

CORPORATION PROJECT EXPERIENCE

03/07 - 11/08 UXO Tech III/ESS/QCS, Tetra Tech, Inc., CMC Project, Iraq.
04/06 - 03/07 UXO Tech III/SUXOS, EOD Technology, Inc., CMC Project, Iraq.
10/05 - 04/06 UXO Tech III, EOD Technology, Inc., Ft. Campbell, KY.
08/05 - 09/05 UXO Tech III, Zapata Engineering, Inc., Tullahoma, TN.
06/05 - 08/05 UXO Tech III, EOD Technology, Inc., Ft. Stewart, GA.
02/05 - 06/05 UXO Tech III, EOD Technology, Inc., Spencer, TN.
10/04 - 12/04 UXO Tech III/Security, EOD Technology, Inc., Iraq.
08/04 - 10/04 UXOSO/QCS, Zapata Engineering, Inc., CEA Project, Iraq.
09/03 - 08/04 UXO Tech III/UXOSO/QCS, EOD Technology, Inc., CEA Project, Iraq.
08/03 - 09/03 UXO Tech II, EOD Technology, Inc. Ft. Campbell, KY.
07/03 - 08/03 UXO Tech II, Zapata Engineering, Inc., Tullahoma, TN.
06/03 - 07/03 UXO Tech II, Zapata Engineering, Inc., Schofield Barracks, HI.
04/03 - 05/03 UXO Tech II, EOD Technology, Inc., RIO Project, Iraq.
02/03 - 03/03 UXO Tech II, EOD Technology, Inc., Albuquerque, NM.
12/02 - 02/03 UXO Tech III, EOD Technology, Inc., Ft. Irwin, CA.
10/02 - 12/02 UXO Tech II, EOD Technology, Inc., Porto Bella, CA.

Richard J. Rogaliner
UXO QUALITY CONTROL/SAFETY OFFICER

08/02 - 10/02	UXO Tech II, EOD Technology, Inc., Lakehurst NAES, NJ.
03/02 - 08/02	UXO Tech III, EOD Technology, Inc., Camden, AR.
02/00 - 12/01	UXO Tech II, EOD Technology, Inc., Ft. Campbell, KY.
01/00 - 02/00	UXO Tech II, EHSI, Inc., Ft. Stewart, GA.
06/99 - 12/99	UXO Tech II, EOD Technology, Inc., Seneca Army Depot, NY.
01/99 - 05/99	UXO Tech II, EOD Technology, Inc., Woodbine, GA.
10/98 - 12/98	UXO Tech II, EOD Technology, Inc., Seneca Army Depot, NY.
09/98 - 10/98	UXO Tech III, EOD Technology, Inc., Crab Orchard, IL.
08/98 - 09/98	UXO Tech II, EHSI, Inc., Pine Ridge, SD.
07/98 - 08/98	UXO Tech II, EHSI, Inc., Pole Mountain, WY.
06/98 - 07/98	UXO Tech II, EHSI, Inc., Lowry AFB Training Annex, CO.
01/98 - 06/98	UXO Tech II, EOD Technology, Inc., McGregor Range, Ft. Bliss, TX.
11/97 - 12/97	UXO Tech II, CMS Environmental, Inc., Roseville, CA.
09/97 - 11/97	UXO Tech II, CMS Environmental, Inc., Ft. Wingate, NM.
08/97 - 09/97	UXO Tech II, CMS Environmental, Inc., Camp Edwards, MA.
09/96 - 06/97	UXO Tech II, CMS Environmental, Inc., Salton Sea Test Range, CA.

MILITARY EOD EXPERIENCE

06/91 - 02/94	EOD Technician- 6th Ord. Det. (EOD) USA. Schofield Barracks, HI.
11/90 - 06/91	EOD Assistant- 6th Ord. Det. (EOD) USA. Schofield Barracks, HI.
02/90 - 06/90	EOD Attached – 6th Ord. Det. (EOD) USA. Schofield Barracks, HI.

PROFESSIONAL ACCOMPLISHMENTS

Military EOD Experience…… 3.75 Years
Commercial UXO Experience…….. 11.83 Years

PROFESSIONAL REFERENCES

David Crossley (Project Manager, TTECI): email – david.crossley@tteci.com
Don Welch (Quality Program Manager, TTECI): email – don.welch@tteci.com
Craig Pope (Iraq Safety/Quality Manager, TTECI): email – craig.pope@tteci.com
Steve Neill (UXO Safety Manager, TTECI): email – steve.neill@tteci.com

Samuel Keith Rivera
EOD/UXO Technician

EXPERIENCE SUMMARY

Over eleven years of experience as an EOD/UXO Technician. Positions held: Safety and Quality Control Manager, SUXOS, Safety/QC Specialist, Tech III-Team Leader, and Tech II-Team Member. Responsibilities have included but are not limited to drawing proposals for future ongoing operations in Iraq, conducting daily operations in order to facilitate site closures, overseeing all safety and quality control aspects of multiple UXO teams on several sites in Iraq, conducting investigations and developing remediation procedures concerning incidents, tracking all accountable records for many sites on a given project, maintaining all applicable certifications to ensure qualified personnel on sites, being responsible for all training conducted to ensure complete compliance with all company policies, guidelines, and standard operating procedures, and running daily operations. Duties have encompassed developing site specific work plan inserts to augment the contract wide work plan, providing input and feedback on critical operations and planning to those on site and those in management positions, performing reconnaissance missions to make detailed assessments for future work concerning UXO operations, conducting Safety Stand downs to ensure all personnel stay on the correct path with the right frame of mind to ensure safety compliance at each site, conducting morning training in detailed format with an open door policy in order to achieve group involvement and development, chosen to help facilitate the take over of the full Iraq-wide Coalitions Munitions Clearance contract in 2007 and develop and train other company personnel to the current company standards. Job experience has included performing demolition six days a week for nine and one half months destroying an average of 200,000 lbs of ordnance on a daily basis, conducting post-blast analyses, ensuring Zero Incident Performance Programs and Do It Right principles are participated in and followed, conducting Safety Observer programs and developing lessons learned, and mentoring multiple individuals. Proficient in typing, organizational, and tracking/monitoring skills. Very proficient with Microsoft Office programs such as Excel, Word, Money, Outlook, Power Point, etc…along with Falcon View, Map Source, and Google Earth mapping/planning programs, GPS, and also Adobe systems. Served as an Active Duty soldier for 8 years in the U.S. Army including multiple deployments and am very comfortable in public speaking and leadership situations.

CERTIFICATIONS ORDERED FROM PRESENT TO PAST

August 2008	Environmental and Safety Supervisor Certified
August 2008	8 hour HAZWOPER Refresher
August 2008	OSHA Supervisor Certified
January 2008	Loss Control Prevention
June 2006	OSHA 30 HR Construction Safety Program (Click Safety)
September 2005	OSHA 10 HR Construction Outreach Training Program
September 2005	OSHA 2 Hr Advance Demolition course
May 2004	Completed course through Shaw Group pertaining to safety standards in driving course, Denver, CO.
January 2004	Hazardous Waste Operations and Emergency Response Course, Salt Lake City, UT.
April 2003	Resource Conservation and Recovery Act (RCRA) Certification, Salt Lake City, UT
September 2002	FBI Large Vehicle Bomb Certification, Salt Lake City, UT
February 2002	Explosive Ordnance Disposal Team Leader Certified, Ft. Lewis, WA
February 2001	STEPO training certification, Redstone Arsenal, AL
August 1999	Certified in Hazardous Material Handling and Transportation from Deseret Chemical Depot and Dugway Proving Grounds, Tooele, UT.
October 1997	Graduate of MOS 55D Explosive Ordnance Disposal School through the Army. Qualified with Andros Robot and Small Emplacement Excavator operations, Indian Head, MD.

Samuel Keith Rivera
EOD/UXO Technician

January 1997 Graduate of MOS 55B Ammunition Technician School through the Army. Qualified with PLS and Forklift, and Sling-Load operations, Redstone Arsenal, AL.

EDUCATION

Date Attended Basic EOD School: March-October 1997
Columbia College of Missouri, Over 90 of 120 Semester Hours completed, Currently pursuing a Bachelors of Science Degree in Business Finance as distance learning student, projected graduate in the winter of 2009.

CIVILIAN UXO EXPERIENCE

June 2008 –Present 2008 ***Tetra-Tech ECI***, Iraq (**Baghdad**) / Leave Status
Tetra-Tech CMC Safety and Quality Control Manager in Baghdad. Work directly with the Project Manager and Operations Manager. Draft all SOPs concerning Tetra-Tech's CMC program. Coordinate all guideline changes between the operation and the client. Work very closely with the client on a daily basis to ensure a fluid relationship between the company operation and client satisfaction. Track the progress of quality and safety for every site on the CMC project and mentor a continual streamlined program for all fields QC / Safety's. Report directly to the Corporate Managers.
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April 2008 – June 2008 ***Tetra-Tech ECI***, Iraq (**Ashraf**)
Senior Unexploded Ordnance Supervisor (SUXOS) remaining in duty assignment of Ashraf's Quality Control Officer to facilitate smoother close out of CMC Ashraf. Fill in **SUXOS** on site allowing preparation for next CMC site startup.

Jan 2008 - April 2008 ***Tetra-Tech ECI***, Iraq (**Ashraf**)
Environmental Safety Supervisor/Quality Control Officer for Mobile Explosives Teams 5 and 6. Split duty into Quality Control position. Oversee Quality Control issues for two full teams working directly with the U.S. Army and Marines to clear suspected targeted insurgent dig sites. Coordinate and maintain accountability and files for all assigned personnel and records to ensure teams are mission capable and the project meets client satisfaction.

Dec 2007- Jan 2008 ***Tetra-Tech ECI***, Iraq (**CMC Wide**)
Conducted reconnaissance mission throughout Iraq assessing future work sites in support of destroying explosives and IED making material on the Coalitions Munitions Clearance contract under the Army Corps of Engineers and Department of Defense.

March 2007 - Dec 2007 ***Tetra-Tech ECI***, Iraq (**ASP WOLF**)
Chosen along with SUXOS to "steer-head" Tetra-Tech takeover of EODT personnel at ASP WOLF and "bring them into the fold" with Tetra-Tech company policies and standards. Adopted two complete new teams worth of personnel, over 350 Local National Security, and two full teams of Ex-Pat Security. Wolf is one of the Tetra-Tech hubs for UXO teams in country and continues to be augmented by personnel with over 550 people currently.
Environmental Safety Supervisor/Quality Control Officer and Property Manager for Mobile Explosives Teams 1, 2, 3 and 10. Oversee Safety aspects and Quality Control issues for over 400 people during operations in a combat zone. Coordinate and maintain accountability and files for all assigned property and equipment to ensure teams are mission capable.

Feb 2007 - March 2007 ***Tetra-Tech ECI***, Iraq (**DULAB**)
Environmental Safety Supervisor/Quality Control Officer and Property Manager for Mobile Explosives Teams 2 and 4. Oversee Safety aspects and Quality Assurance issues for over 200 people during operations in a combat zone. Coordinate and maintain accountability and files for all assigned property and equipment to ensure teams are mission capable.

Samuel Keith Rivera
EOD/UXO Technician

July 2006 - Feb 2007 ***Tetra-Tech ECI***, Iraq (**Jaguar Middle and Jaguar South**)
Environmental Safety Supervisor/Quality Control Officer and Property Manager for Mobile Explosives Teams 2, 3, and 6. Oversee Safety aspects and Quality Assurance issues for over 150 people during operations in a combat zone. Coordinate and maintain accountability and files for all assigned property and equipment to ensure teams are mission capable.

May 2006 - July 2006 ***Tetra-Tech ECI***, Iraq (**ASP 3**)
Environmental Safety Supervisor and Quality Control Officer for Mobile Explosives Teams 1, 8, and 10 at ASP 3. Oversee all Safety aspects and Quality Assurance issues for over 120 people during operations in a combat zone.

February 2006 - May 2006 ***Tetra-Tech ECI***, Iraq (**ASP7 and ASP 3**)
Contract changeover, working as a Tech 3 for mobile teams. **Team Leader** for Mobile Teams 1, 8, and also 10. Team out-performed most other Mobile teams in Iraq when it came to production.

December 2005 - February 2006 ***USA Environmental***, Baghdad, Iraq (**BIAP, SPEICHER, NAJAF, ASP 7**)
Performed as a "floater" **Tech 3/Team Leader**. Vacation relief for teams 1, 6, 5, and 3.

August 2005 - December 2005 ***USA Environmental***, Baghdad, Iraq (**BIAP**)
Performed as a **UXO Tech II** on mobile team 1.

August 2004 - August 2005 ***Tetra-Tech/ FWI***, Al Ashraf, Iraq (**ASHRAF**)
On a minimum of seventy-two (72) hour work weeks, performed as a **UXO (Unexploded Ordnance) Technician II**. Participated in demolition and collection duties on a daily basis. Trained and performed proficiently with a forklift and PLS with no accidents/incidents. Performed on demolition team responsible for over one hundred (100) tons, as a minimum, of demolition daily. Chosen to perform on a three-man geological survey team for input of demolition access route.

March 2004 - August 2004 ***Shaw Group E & I,*** Former Lowery Bombing Range, CO
Performed as a **UXO (Unexploded Ordnance) Technician II**. Participated in range work duties including operating heavy machinery (i.e. Backhoes, Forklifts, Front-end loaders, etc…). Additional duties performed guiding geological survey teams during assessment operations**.** Fluent knowledge of magnetometers and safety equipment.

MILITARY WORK EXPERIENCE:

Dec 2003 - Mar 2004 *United States Army*, Tooele Army Depot, UT
Performed as **Operations Non-Commissioned Officer** for Re-Deployment duties from Operation Enduring Freedom without incident or injury for all personnel and equipment. Successfully performed as a **Team Leader** in the 62nd Ordnance Company EOD (Explosive Ordnance Disposal), supervised, performed and trained others in the skills of safe yet rapid render safe and /or disposal of hazardous foreign and domestic explosive, chemical and improvised explosive devices of military or commercial origin.

Samuel Keith Rivera
EOD/UXO Technician

Jun 2003 - Dec 2003 *Operation Enduring Freedom*, ARCENT-KU, (Iraq/Kuwait/Qatar/Saudi Arabia)
Performed, with distinction, liberation duties during a time of war as an **Explosive Ordnance Disposal Team Leader** in support of Coalition Forces and Military/police forces. Supervised a two-man team while rendering safe and/or destroying in excess of 250,000 hazardous items. Maintained and accounted for equipment valued in excess of Two Hundred and Twenty Thousand (US) Dollars with no losses. Selected by Commander and First Sergeant to coordinate three multi-area range clearances due to ability to take charge and accomplish any mission. Taught vehicle search and Explosive Ordnance Recognition classes to over 800 civilians and military personnel.

May 2002 - Jul 2002 *United States Army*, Ft. Carson, CO (Back-stop)
Successfully performed as a **Team Leader** in the 764th Ordnance Company (Explosive Ordnance Disposal). Supervised, performed and trained others in the skills of safe yet rapid render safe and /or disposal of hazardous foreign and domestic explosive, chemical and improvised explosive devices of military or commercial origin

Feb 2002 - Jan 2004 *United States Army*, Tooele Army Depot, UT
Successfully qualified as a **Team Leader** in the 62nd Ordnance Company (Explosive Ordnance Disposal), supervised, performed and trained others in the skills of safe yet rapid render safe and /or disposal of hazardous foreign and domestic explosive, chemical and improvised explosive devices of military or commercial origin. Performed range clearances at Camp Williams, UT and Gowen Air Field, ID. **Security NCO** in handling all materials and records pertaining to clearances and sensitive items with no incidents. Controlled and maintained all classified materials and equipment in monetary values of over $500,000.

Nov 2001 - Feb 2002 *2002 Winter Olympic Games and Para-Olympic Games*, Salt Lake City, UT
Performed on **vulnerability assessment team** for the implementation of Force Protection standards for all fellow soldiers. Successfully trained in excess of Three Hundred military and civilian personnel in the areas of bomb threat and search procedures.

May 2001 - Nov 2001 *United States Army*, Tooele Army Depot, UT
Successfully performed as an **EOD Team Member** in the 62nd Ordnance Company (Explosive Ordnance Disposal). Performs, under supervision of a Team Leader, safe yet rapid render safe and /or disposal of hazardous foreign and domestic explosive, chemical and improvised explosive devices of military or commercial origin. Selected for advancement and subsequent promotion as a Team Leader. Maintained One Hundred percent accountability of team equipment valued at over One Hundred and Fifty Thousand (US) Dollars.

Oct 2000 - May 2001 *Operation Joint Guardian*, Kosovo Force 2a (KFOR 2a) Kosovo, Serbia
Performed with distinction, peace keeping duties as an **Explosive Ordnance Disposal Technician** in support of US, North Atlantic Treaty Organization (NATO) & United Nations (UN) aid groups and military / police forces. Supervised two personnel while rendering safe and/or destroying in excess of 12,000 hazardous explosive items. Taught numerous classes to military/civilian/and UNMIK (foreign) police forces on explosive safety and recognition.

Nov 1997- Oct 2000 *United States Army*, Tooele Army Depot, Dugway Proving Grounds, and Deseret Chemical Depot, UT
Successfully performed as an **EOD Team Member** in the 62nd Ordnance Company (Explosive Ordnance Disposal). Performs, under supervision of a Team Leader, safe yet rapid render safe and /or disposal of hazardous foreign and domestic explosive, chemical and improvised explosive devices of military or commercial origin.

Samuel Keith Rivera
EOD/UXO Technician

Maintained, as the **NBC NCO**, over Three Hundred and Eighty-Three Thousand Dollars (US) worth of equipment with One Hundred percent accuracy. Performed on range clearance teams at Camp Roberts, California; Camp Williams, Utah; and Sierra Army Depot, California.

Mar 1997 - Oct 1997 *U. S. Army & U. S. Navy*, Redstone Arsenal, AL; Eglin Air Force Base, FL & Indianhead Naval Ordnance Station, MD

Successfully completed the U.S. Navy School of Explosive Ordnance Disposal's (NAVSCOLEOD) three phases of training as an Explosive Ordnance Disposal Specialist. Graduated as a qualified **Explosive Ordnance Disposal Team Member**.

Aug 1996 - Mar 1997 *United States Army*, Basic, Initial Entry Training (IET), and Advanced Individual Training (AIT)

Successful training & assignments as an **Infantryman and Ammunition Technician (55B)**

PROFESSIONAL REFERENCES

David Crossley (Project Manager, TTECI): email – david.crossley@tteci.com
Don Welch (Quality Control Manager, TTECI): email – don.welch@tteci.com
Mark Fletcher (Programs Manager, ECC): email - mfletcher@ecc.net
Mark Lasley (Senior Tech Advisor, UXB): email – lasley29@hotmail.com
Jody Blakemore (Quality Control, Shaw): email - jody.Blakemore@shawgrp.com

Mr. Donald Wayne Welch Jr.
UXO Quality Program Manager/ Project Manager

EXPERIENCE SUMMARY

Over ten years of experience in the EOD/UXO industry. 7 years in leadership and management positions, with demonstrated hands on experience in organization building, operational planning, execution, policy development, problem solving, budgeting and professional training, curriculum, and standard operating procedure development. Articulate with highly developed writing and presentation skills
Currently filling key positions as UXO Quality Program Manager and Project Manager for Tetra Tech EC, Inc. As the UXO Quality Program Manager is responsible for development of the quality control program and supervision of all UXO Quality Specialist within the UXO Program. As the Project Manager is responsible for overseeing all scheduling and supervision of project activities as well as functions including, proposal preparation, procurement, deliverable production, and government property control.

EDUCATION

MBA, University of North Alabama, in progress
BS, Safety Management, Columbia Southern University Aug 2006
Diploma, Basic EOD School, Indian Head, MD Jan, 1997

REGISTRATIONS/CERTIFICATIONS

Security Clearance, DoD, Type: TS/SCI, Number DONCAF, with SSBI
Certified Quality Manager, ASQ, Number 7950
Certified Quality Auditor, ASQ, Number 30416

TRAINING

40-Hour OSHA 1910.120 HAZWOPER – 2000
8 Hour OSHA 1910.120 HAZWOPER Refresher Current-10/08
Corporate Project Management Level 100 Training 9/04
Corporate Project Management Level 200 Training 10/04
Corporate Project Management Level 300 Training 3/08
DOT Hazardous Material Security Awareness Training 11/04
Environmental Safety Supervisor Training 5/05
30-Hour OSHA Construction Safety and Health 1/2006
Negotiations Training 5/08

CORPORATION PROJECT EXPERIENCE

UXO Program Quality Manager
Tetra Tech EC, Inc. Company Wide April 2004 - Present
Responsible for development of the UXO Quality Control program. Developed a full spectrum of quality tools and procedures that standardized and streamlined the TTECI UXO QC Program. Developed and implemented a comprehensive quality control training program. Develop quality control plans and review project plans. Supervise all UXO Quality Specialist within the UXO Program.

Project Manager
Blackstone Removal Action, Former Lowery Bombing and Gunnery Range, Denver Colorado
Ordnance and Explosives Response May 2004 – Aug. 2004
Develop work plan and other related documents related to project performance and completion. Directed and tracked all personnel, budget, and sub contracts related to the project. Liaison with state regulatory agency to assure regulatory objectives was met. Received State concurrence on the removal action within seven days of the removal report being submitted.

Mr. Donald Wayne Welch Jr.
UXO Quality Program Manager/ Project Manager

Project Manager
High Plains Extension, Former Lowery Bombing and Gunnery Range, Denver Colorado
Ordnance and Explosives Response May 2004 – Aug. 2004
Develop work plan and other related documents related to project performance and completion. Directed and tracked all personnel, budget, and sub contracts related to the project. Liaison with state regulatory agency to assure regulatory objectives was met. Received State concurrence on the removal action within seven days of the removal report being submitted.

Project Manager
Patuxent Research Refuse, Ft. Meade, Area G Location
Time Critical Removal Action May 2004 – July 2004
Develop work plan and other related documents related to project performance and completion. Directed and tracked all personnel, budget, and sub contracts related to the project.

Project Manager
Grass Lands Development UXO Site Assessment, Former Lowery Bombing and Gunnery Range, Denver, Colorado October 2002
Develop work plan and other related documents related to project performance and completion. Directed and tracked all personnel, budget, and sub contracts related to the project. Liaison with state regulatory agency to assure regulatory objectives was met.

Deputy Project Manager
High Plains and Beacon Point UXO Removal, Former Lowery Bombing and Gunnery Range, Denver, Colorado June 2002 – May 2003
Monitored and assessed daily activities as the assistant project manager. Prepared updated budgets and tracked all personnel, subcontractors and subcontracts for safety, performance and completion. Liaisons with state regulatory agency to assure regulatory objectives were met.

Unexploded Ordnance Technician, Database Manager, Delivery Order-10
Ordnance and Explosives Response, Ft. McClellan, Alabama, November 2001 – June 2002
Designed, constructed and maintained field database and data collection units. System is capable of allowing field teams to collect data, the timely transfer of field data into a centralized database. This allowed for the data to be evaluated daily.

Unexploded Ordnance Technician
Ordnance and Explosives Response, Ft. McClellan, Alabama, June 2001 – November 2001
UXO team member deployed in field conditions in the discovery, identification and destruction of UXO. Trained to operate all geophysical equipment in the companies equipment pool.

Mr. Donald Wayne Welch Jr.
UXO Quality Program Manager/ Project Manager

PREVIOUS EXPERIENCE

Explosive Ordnance Disposal Team Leader, May 2003 – April 2004
666th EOD Company, Alabama National Guard
Activated for Military Service. Deployed as the EOD Team Leader in support of contingency operation to the Former Republic of Yugoslavia.

Unexploded Ordnance Technician, March 2001 – June 2001
Human Factors Application, Ft. McClellan, Alabama
UXO Team Member for CWM EECA conducted aboard Fort McClellan, AL

Unexploded Ordnance Technician, Jan. 2001 – March 2001
USA Environmental, Conway Bombing Range, Myrtal Beach, South Carolina
UXO Team Member for UXO Removal conducted on the former Conway Bombing Range.

US Marine Corps, 1991 – Jan. 2001
Served in multitude of positions and locations over a 10 year career.

PROFESSIONAL AFFILIATIONS

American Society for Quality-Senior Member 01/02
Interstate Technology Regulatory Commission, UXO Group 01/04
Board of Certified Safety Professionals 06/08

APPENDIX I
SOPs

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SOP 1

MEC Disposal

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1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish basic procedures for conducting MEC/MC disposal by open detonation. Information contained in the SOP should be used in conjunction with appropriate sections of the approved Site Specific Work Plan (WP) and the approved Accident Prevention Plan (APP). Adjustments to the procedure must be approved by the UXO Discipline Lead and may require review by the client.

2.0 SCOPE

The procedures in this document are applicable to all UXO employees of TtEC and its subsidiaries conducting MEC disposal operations by open detonation

The procedures presented in this SOP are IAW the following:

- Federal Acquisition Regulation (FAR) 45.5 - Management of Government Property in the Possession of Contractors;
- Department of Defense (DoD) 6055.9-STD - DoD Ammunition and Explosives Safety Standards;
- Department of the Army Pamphlets (DA PAM) 385-64 - Ammunition and Explosives Safety Standards;
- Army Regulation (AR) 385-64 - U.S. Army Explosives Safety Program;
- Technical Bulletin (TB) 700-2 - Regulation: Department of Defense Ammunition and Explosives Hazard Classification Procedures; and
- Department of Transportation (DOT) Regulations related to transportation of explosives and hazardous materials.

3.0 MINIMUM REQUIREMENTS

3.1 GENERAL REQUIREMENTS

All employees are required to follow the minimum requirements listed in this procedure. Any employee may request permission to vary from these requirements if they are in conflict with our corporate “Operating Philosophies”, are unsafe, or are not compatible with contract or site-specific requirements. Permission to vary from this procedure must be obtained from the UXO Discipline Lead.

All personnel engaged in disposal operations must be thoroughly trained in explosive safety and demolition procedures and capable of recognizing hazardous situations and taking prompt corrective action. Disposal operations will not be conducted without client authorization, approved plans/SOPs, qualified and trained UXO personnel, and proper demolition and safety equipment.

3.2 COORDINATION AND NOTIFICATIONS

Coordination should begin with a meeting or teleconference with the client to identify the responsibilities of each organization. The meeting/teleconference will address specific elements of planning and organizational responsibilities. Topics will include:

a) Demolition team make-up and assignments;
b) Explosive handling, storage and transportation;
c) Required support services, fire, medical, security, etc.;
d) Emergency procedures;
e) Notification process;
f) Maintenance of exclusion zones; and
g) Community impact.

Roles and responsibilities have been established in the Statement of Work and written into the Work Plan. The coordination meeting will provide an opportunity to confirm the roles and responsibilities and review procedures.

Before beginning MEC disposal activities, local security/law enforcement, fire, and medical personnel should be notified, as well as any other appropriate personnel/organizations per the approved project plans. The notifications should address scheduling, road closures (if any), Exclusion Zones (EZs) and any other required support. As a minimum, the following agencies should be notified and be prepared to respond:

a) Medical; Regional Medical Center, 400 E 10th Street, Anniston, AL 36202, (256) 235-5121
b) Fire Department; Anniston Fire Dept., 225 E 17th St, Anniston, Al 36207, (256) 231-7644
c) Police Department; Anniston Police Dept, 1200 Gurnee Ave, Anniston, AL 36201, . (256) 238-1800
d) Fort McClellan Transition Force Operations; (256) 848-5680.

3.3 EZ INFORMATION PACKETS

The Senior UXO Supervisor (SUXOS) will distribute EZ information packets to the identified POCs for each responsible site activity as required by the SOP. The packets will include maps with EZs clearly marked. The packet must specify who is responsible for each task. Tetra Tech personnel will establish and maintain EZs during disposal operations. Access to the EZ will be coordinated through on-site UXO personnel and will comply with visitor control procedures. The EZ will remain intact until proper notification is received from the disposal team that disposal operations are complete.

4.0 EQUIPMENT/MATERIAL REQUIREMENTS

The Demolition Supervisor will be responsible for ensuring all required equipment and materials are on site. The attached checklists should be used to document this activity. As a minimum, the following will be checked daily prior to commencing disposal operations:

a. Demolition equipment (Demolition Equipment Checklist, Attachment 1)

b. Health and Safety Equipment (Health and Safety Equipment Checklist, Attachment 2)

c. Range/explosive vehicles

d. Explosives

4.1 REQUIRED DOCUMENTS

The following documents are required to be on site during disposal operations:

a. Approved work plans;

b. Approved ESS

c. DOD 6055.9;

d. Service directives;

e. State and local directives;

f. 27CFR, Part 555 – Commerce in Explosives;

g. EOD publication set (minimum of 60A-1-1-31); and

h. This procedure.

5.0 DISPOSAL OPERATIONS

5.1 SAFETY BRIEFS

Conduct the following safety briefs prior to conducting disposal operations:

a. General Safety Precautions (Attachment 3);

b. Team assignments;

c. Operation overview;

d. Review of explosive handling procedures;

e. Emergency Procedures;

f. Type and condition of MEC;

g. Two-person rule;

5.2 ENGINEERING CONTROLS

Engineering controls will not be used for this project.

5.3 POSTING OF STANDARD OPERATING PROCEDURES (SOP)

The locally approved Demolition SOP, with emergency procedures, points of contact, safety precautions and communications protocol, will be provided to all personnel and will be available at the disposal site. Since there is no site office for this project, it will not be possible to post the SOP.

5.4 COMMUNICATIONS

Two methods of communications will be utilized during disposal operations. The preferred methods are landline telephones (if available) and radios. Radio and cellular phone transmissions will be secured whenever electric blasting caps are exposed.

5.5 EXCLUSION ZONE (EZ)

Prior to beginning disposal operations an EZ will be established IAW the approved WP for the project. Reduction of approved EZ distances will require approval by the client and DoD component explosive safety personnel. During MEC operations, only essential project personnel are allowed in the EZ. The SUXOS will coordinate with local authorities on road closures and facility evacuations in order to clear the EZ.

5.6 SAFETY WARNINGS

The following steps will be taken to ensure that disposal operations are conducted in a safe and prudent manner:

1. Ensure all required notifications have been made;
2. Set up EZ and man barricades;
3. Visually inspect the EZ and surrounding area for unauthorized personnel;
4. The SUXOS will give a five-minute warning on the radio by executing a one-minute series of long blasts on the horn/siren prior to detonation of MEC and donor explosives.
5. The SUXOS will give a one-minute warning on the radio by executing a series of short blasts on the horn/siren one-minute prior to the shot.
6. Prior to initiating the shot the SUXOS will give three, loud "Fire in the Hole" warnings then give the fire command on the radio.

After disposal is complete, the disposal area will be inspected and a prolonged blast on the horn/siren will be sounded to indicate that the area is safe.

5.7 RANGE VEHICLES

The following requirements apply to range vehicles:

There will be a sufficient number of vehicles to transport all personnel involved in the disposal operation.

1. Each vehicle must have a seat, with a seat belt, for each person.
2. Vehicles will be parked in a protected area, free of vegetation, facing away from the detonation site. The keys will remain in the ignition at all times.
3. Vehicles designated to transport explosives will not be used to transport passengers. Explosive vehicles must comply with the provisions of 49CFR 177.835(e) and (f).
4. Smoking or flame-producing devices are not permitted within 50 feet of explosive vehicles.
5. Vehicles will not be driven or parked in areas with dry vegetation that could be ignited by the heat generated from catalytic converters.

5.8 WEATHER AND ENVIRONMENTAL CONSIDERATIONS

The following requirements apply to disposal operations with regard to weather-related hazards:

1. Prior to commencing disposal operations the SUXOS will obtain a local weather report.
2. Disposal operations will not be conducted if electrical storms are within 10 miles or during any severe weather conditions that would impact safety.

5.9 EMERGENCY MEDICAL SUPPORT

The following medical support requirements apply to disposal operations:

1. The telephone number of the responding medical facility will be posted in plain sight at the at the disposal site.
    a. Regional Medical Center, 400 E 10th Street, Anniston, AL 36202, (256) 235-5121
2. Emergency medical personnel will be notified of the location and duration of disposal operations each day.
3. All UXO personnel conducting disposal operations will be trained in first aid and CPR.
4. A first aid kit, portable eyewash and blood borne pathogen kit will be on site at all times. Ensure the first aid kit contains dressings capable of treating the traumatic injuries that could result from an explosion.

5.10 FIRE SUPPORT

The following fire support requirements apply to disposal operations:

1. The telephone number of the responding fire department will be posted in plain sight at the disposal site.
    a. Anniston Fire Dept., 225 E 17th St, Anniston, Al 36207, (256) 231-7644.

2. The fire department will be notified of the location and duration of disposal operations each day.
3. When the fire hazard is high due to dry conditions disposal operations will not be conducted unless mobile fire-fighting equipment is standing by and the fire department is capable of responding within five (5) minutes.
4. Fire extinguishers, portable water tanks and shovels will be on site to fight small fires. Evacuate the area if the fire approaches ordnance or explosives. Do not fight grass fires in areas where there may be ordnance or kick-outs.

5.11 TWO-PERSON RULE

The Two-Person Rule is a safety concept that requires two knowledgeable individuals to perform potentially hazardous operations together. These individuals must be capable of recognizing and reporting unsafe, negligent or criminal behavior. The Two-Person Rule will apply whenever explosives are handled or transported during disposal operations. No one will handle or assemble explosive components alone.

5.12 PERSONNEL PROTECTIVE EQUIPMENT

Unless otherwise directed disposal operations will be conducted in Level "D". PPE will consist of non-static producing clothing, gloves, safety glasses and conductive steel toe boots.

5.13 WHITE PHOSPHOROUS (WP)

The following procedural/safety requirements apply to disposal operations involving WP:

1. Ensure medical support personnel know they are supporting WP disposal operations and have WP first aid treatment materials on hand.
2. In the field irrigate WP wounds with water, pick out visible pieces of WP (with knife or tweezers), and apply saline soaked dressing. Keep dressing wet until arrival of medical personnel.
3. Water and sand will be readily available when disposing of suspected WP ordnance.
4. WP filled ordnance will be Counter-Charged Bottom Centerline (CCBC) to disperse the WP in the air for complete combustion.
5. Care must be taken when returning to the disposal side after detonation to ensure that all WP was consumed.
6. Do not approach the disposal area until all smoke has cleared and the SUXOS has declared the area safe.
7. Do not conduct WP disposal operations when the ambient temperature is above 95 degrees Fahrenheit.

5.14 RANGE SCRAP

An inspection of the disposal site and surrounding area will be conducted after each disposal operation. All munitions debris will be picked up and containerized for later disposal.

5.15 RECORDKEEPING

For disposal operations the Senior UXO Supervisor or the UXO Demolition Supervisor will, as a minimum, complete the following.

1. Disposal Operations Checklist (Attachment 4)
2. Explosive Disposal Log (Attachment 5)

5.16 RANGE DISPOSAL OPERATIONS

5.16.1 Initiation Systems

The following requirements/criteria apply to initiation systems used for MEC disposal:

1. The primary firing system will be the Remote Firing Device with Nonel.
2. The alternate firing system will be the Remote Firing Device with electric blasting caps
3. The secondary system will be the Scorpion Electronic Blasting Machine with electric or Nonel initiation.
4. In areas of increased electromagnetic radiation, or a high fire index, a Nonel system will be used if possible.

5.16.2 Remote Firing Device Preparation

The following steps will be taken to prepare the remote firing device for disposal operations:

1. Perform system pre-operational test and set up using the operator's manual. Remove key from controller unit until ready to fire.
2. Place the remote near the detonation site with the antenna in the vertical position. If using electric caps the remote should be within 100 feet of the shot. Using the unit blast shield, sandbags, or natural cover to protect the remote.
3. Ensure the remote indicates a READY condition for the selected initiation method (green READY LED on steady, red ARMED LEG off).
4. If using Nonel, connect the shock tube to the igniter tip. The tube should be wrapped around through holes in the tip's molded casing to keep it from falling out. Prime the shot and return to the safe area.
5. If using electric caps, cut off a length of firing wire that will reach between the remote and the charges (100' or less).
6. Conduct a continuity check of the firing wire with a galvanometer. Shunt the free ends of the wire to prevent an electric charge from building up in the firing wire.

7. Test each electric blasting cap 50 feet downwind of other explosives with a galvanometer.
8. Place blasting caps in a hole, behind a barricade or under a sandbag before removing the shunt and testing for continuity.
9. Fully extend the leg wires and ensure the cap is pointing away from the person conducting the continuity test.
10. Secure the leg wires to prevent the cap from moving during the test.
11. Use only a special silver-chloride dry cell battery in the testing galvanometer. Other type batteries may provide sufficient voltage to fire the blasting cap.
12. Upon completion of testing, re-shunt the leg wires. The wires will remain shunted until ready to connect to the firing circuit.
13. For dual priming connect blasting caps in a parallel circuit to the extension wires.
14. Test the circuit with the Galvanometer, and then connect extension wires to the remote.
15. Retrieve caps from barricade, prime shot and return to safe area.

5.16.3 Firing the Remote Firing Device

The following steps will be taken to activate the remote firing device for disposal operations:

1. The SUXOS will verify that the exclusion zone is clear and barricades are in place.
2. The SUXOS will give a "five-minute warning" on the horn/siren and radio.
3. The SUXOS will give a "one-minute warning" on the horn/siren and radio.
4. Install the key and engage the "POWER" switch on the controller to the right until the BATTERY LED illuminates.
5. Momentarily depress the controller STATUS button. The yellow TRANSMIT LED will flash for approximately one second. At the end of this time a green READY LED will come on steady, indicating that the remote is on and in the standby mode. The steady green LED also indicated the remote is within range of the controller.
6. Push the ARM/DISARM switch to the left and hold for one second. The red ARMED LED will flash for approximately 18 seconds ad then come on steady. The remote is now armed.
7. UXO Demolition Supervisor gives three loud "Fire-in-the-Hole" warnings.
8. SUXOS gives fire command on the radio.
9. SUXOS gives permission to fire the shot.
10. Lift the safety cover on the FIRE switch and push the FIRE switch forward.

5.16.4 Preparation of the Scorpion Electronic Blasting Machine

The following steps will be taken to prepare the Scorpion Electronic Blasting machine for disposal operations:

1. Perform pre-operational check as per instructions on blasting machine.

2. Lay out firing wire or Nonel.
3. Conduct a continuity check of the firing wire with a galvanometer. Shunt the free ends of the wire to prevent an electric charge from building up in the firing wire.
4. Test each blasting cap with a galvanometer 50 feet downward of other explosives.
5. Place blasting caps in a hole, behind a barricade or under a sandbag before removing the shunt and testing for continuity.
6. Fully extend the leg wires and ensue the cap is pointing away from the person conducting the continuity test.
7. Secure the leg wires to prevent the cap from moving during the test.
8. Use only a special silver-chloride dry cell battery in the testing galvanometer. Other type batteries may provide sufficient voltage to fire the blasting cap.
9. Upon completion of testing, re-shunt the leg wires. The wires will remain shunted until ready to connect to the firing circuit.
10. For dual priming connect blasting caps in a parallel circuit to the firing wire.
11. Retrieve caps from barricade, prime shot and return to safe area.

5.16.5 Firing the Scorpion Electronic Blasting Machine

The following steps will be taken to activate the Scorpion Electric Blasting machine:

1. The SUXOS will verify that the exclusion zone is clear and barricades are in place.
2. The SUXOS will give a "five-minute warning" on the horn siren and radio.
3. The SUXOS will give a "one-minute warning" on the horn siren and radio.
4. If firing electric check firing wire with a galvanometer.
5. Connect the firing leads to the terminal posts of the blasting machine.
6. For Nonel plug in the shock tube adapter and attach Nonel.
7. The UXO Demolition Supervisor will give three loud "Fire-in-the-Hole" warnings.
8. The SUXOS will give the fire command on the radio.
9. The SUXOS will give permission to fire the shot.
10. Depress and hold CHARGE button (keep depressed throughout sequence).
11. Press DETONATE button when green ready light comes on. For non-electric shots hold DETONATE button down for one second and release.

5.16.6 Misfire Procedures for the Remote Firing Device

1. Make three successive attempts to fire.
2. Turn off the controller and remove the key.
3. Wait 30 minutes from the last initiation attempt.
4. After the wait time has elapsed, the demolition supervisor and a safety observer will proceed down range to inspect the firing system.

5. If Nonel was used do not remove the caps from the charge. Disconnect Nonel from the igniter tip on the remote. Place a new, primed explosive charge next to the misfired charge (FM 5-250).
6. If electric caps were used remove the old basting caps from charge and disconnect from extension wires. Shunt cap leg wires.
7. If detonating cord was used cut detonating cord between cap and charge, disconnect cap from extension wires. Shunt cap leg wires.
8. Set up new firing system.

5.16.7 Misfire Procedures for the Scorpion Electronic Blasting Machine

1. Make three successive attempts to fire.
2. If using firing wire and still unsuccessful disconnect wires and check continuity.
3. If continuity is good reconnect to blasting machine and make three more attempts to fire.
4. If still unsuccessful check connections of firing wires to terminals and make three more attempts to fire.
5. Change blasting machine after third unsuccessful attempt.
6. If unsuccessful with new blasting machine disconnect and shunt firing leads.
7. If using Nonel disconnect from blasting machine.
8. Wait 30 minutes from the last initiation attempt.
9. After the wait time has elapsed, the demolition supervisor and a safety observer will proceed down range to inspect the firing system.
10. If electric caps were used remove the old blasting caps from charge and disconnect from firing wire. Shunt cap leg wires.
11. If detonating cord was used cut detonating cord between cap and charge, disconnect cap from fire wire. Shunt cap leg wires.
12. If Nonel was used do not remove the caps from the charge. Place a new, primed explosive charge next to the misfired charge. (FM-5-250).
13. Set up new firing system.

5.17 SHOCK TUBE FIRING SYSTEMS

Shock tube is a thin plastic tube of extruded polymer with a layer of special explosive dust deposited on its interior surface. The special explosive dust propagates a detonation wave, which is normally contained within the plastic tubing. Shock tube offers the instantaneous action of electric initiation without the risk of accidental initiation of the blasting cap by radio transmitters in the area or by static electricity discharge. The shock tube medium is extremely reliable.

5.17.1 Shock Tube Splicing

The high reliability of shock tube blasting is due to the fact that all of the components are sealed and unlike standard non-electric priming components, cannot be easily degraded by moisture.

Cutting the shock tube makes the open end vulnerable to moisture. Care should be taken to keep moisture from the cut end of the shock tube. Use the following procedures to cut and splice shock tube.

1. Use a sharp knife or razor blade to squarely cut (90 degree angle) approximately 18 inches from a new roll or the cut off end of a partial roll.
2. Loosely tie the two shock tube ends to be spliced together in a SQUARE KNOT. Leave at least two inches free at the end of each shock tube beyond the knot.
3. Pull the shock tube lightly to tighten the knot, but not so tight as to significantly deform the shock tube in the knot.
4. Use only the splicing tubes provided to make splices. Taping the two cut ends of shock tube together does not make a reliable splice.
5. Push one of the free shock tubes, to be spliced, firmly into one of the pre-cut splicing tubes at last 1/4 inch.
6. Push the other shock tube end firmly into the other end of the splicing tube at least 1/4 inch. Attempt to push the two ends up against each other or get as close as possible.
7. Secure splice with electrician's tape.
8. Each additional splice in shock tube reduces the reliability of the priming system. Minimize the number of splices in a shock tube line to as few as possible.
9. Spool out the desired length of shock tube and cut off squarely with a sharp knife or razor blade.
10. Secure the shock tube remaining on the spool by tying a tight overhand knot in the loose end.
11. Protect the open end of the shock tube by sealing it with the end caps provided or with electrician's tape.
12. Attach an initiator to the free end of the shock tube that is spliced into the blasting cap. If a separate blasting cap or detonating cord is used to actuate the shock tube, tie a tight overhand knot in this end.

5.17.2 Shock Tube Set Up

Lay out required length of shock tube (trunk line) from demo area back to the firing point.

1. Attach an EZTL 30 bunch block (or equivalent) using the supplied splicing tube to the lead line at demo site. Secure the bunch block or immobilize with sandbags. Run additional lead line(s) from bunch block to MEC (See Figure 1).
2. Only attach a maximum of six additional leads per bunch block. Use additional bunch blocks, if necessary.

5.18 DONOR EXPLOSIVES

The primary donor explosives used for MEC disposal will be the one-pound pentolite booster, plastic explosives, jet perforators, or binary explosives.

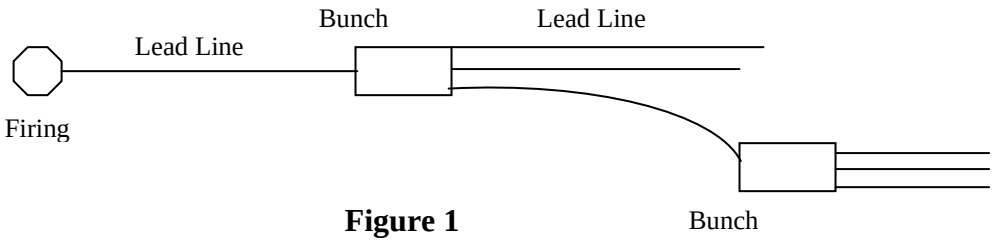

Figure 1

5.18.1 One Pound Pentolite Booster

Insert 80 grain detonating cord into the detonator well. Insert all the way through and back through other hole and tie an overhand knot to secure it. When using more than one booster, insert detonating cord through each of the boosters' detonator wells and secure to keep them from sliding along the detonating cord.

5.18.2 Plastic Explosives

Set up with blasting cap(s) or detonating cord lead(s) as per EODB 60-1-1-31. Position plastic explosives on MEC.

5.18.3 Jet Perforator

1. Using the detonating cord clip provided to secure detonating cord to the Jet Perforator.
2. Place the Jet Perforator on the MEC/MC using tape or other suitable methods to prevent it from moving.
3. For tamped shots, use a box or other suitable material to provide soil from getting between the perforator and MEC/MC item.

5.18.4 Binary Explosives

Binary explosives are two part explosives that are not classified as an explosive until mixed. These can be procured in various configurations to include plastic tube containers and pliable paks in varying sizes depending on the required application. The binary should not be mixed until ready for use. After mixing it can be primed as a cap sensitive explosive using Nonel, detonating cord or electric or non-electric blasting caps. Use as any high explosive with a velocity of detonation around 20,000 fps.

6.0 POST DEMOLITION PROCEDURES

Wait the designated wait times specified by the SOP. A minimum 5 minutes after single shots or after a series of shot that can be counted. A minimum of 30 minutes after multiple shots that could not be counted.

The demo supervisor and one other UXO technician will then return to the detonation site and check the results of the shot. If the procedure was successful the demo supervisor will call in additional personnel to clean up the site. UXO personnel will conduct a visual sweep of the detonation site and the immediate area to gather fragments and explosive residue, if present:

1. Explosive residue will be collected and detonated;
2. Metal fragments will be examined to ensure complete consumption of explosive material;
3. Intact MEC items that failed to detonate will be disposed of;
4. After the area is swept and cleared the Demo Supervisor will notify the SUXOS and the "All Clear" will be given; and
5. The SUXOS will notify all activities that the disposal operation is complete per the SOP.

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SOP 1
ATTACHMENT 1
DEMOLITION EQUIPMENT CHECKLIST

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DEMOLITION EQUIPMENT CHECKLIST

Equipment List

Equipment	Quantity	Comments
Explosive vehicles		
Personnel vehicles		
Camcorder/digital camera		
Siren		
Air horn		
Bravo flag (Red)		
Handheld radios		
Cellular telephone		
Electronic firing device		
Radio controlled firing device		
Ruler, 24-inch		
Schonstedt locator		
Shovel, round point, long handle		
Shovel, round point, short handle		
Blasting machine		
Tape, duct		
Tape, measuring, 50- or 100-meter		
Tape, plastic		
Toolbox, general hand tools		
Galvanometer		
Firing wire		
Demolition kit		
Knife		

Checklist Verification

Disposal Supervisor Signature	Date:

TETRA TECH EC, INC.

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SOP 1
ATTACHMENT 2
HEALTH AND SAFETY EQUIPMENT CHECKLIST

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HEALTH AND SAFETY EQUIPMENT CHECKLIST

Equipment List

Equipment	Quantity	Comments
Air horn, emergency		
Burn blanket		
Burn kit		
Emergency eye wash		
Fire blanket		
Fire extinguisher, 10-pound ABC		
Bloodborne pathogen kit		
First aid kit (equipped for white phosphorus burns)		
Gloves, leather		
Goggles		
Face shield		
Welders' gloves		
Welders' apron		
Rain suit		
Safety vest		
Stretcher		
Water, 5-gal bottle (emergency shower)		
Water, drinking- 1 liter per person		
Other:		
Other:		

Checklist Verification

Disposal Supervisor Signature	Date:

TETRA TECH EC, INC.

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SOP 1
ATTACHMENT 3
GENERAL SAFETY PRECAUTIONS

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General Safety Precautions

1. Carry blasting caps in approved containers and keep them out of the direct rays of the sun. Keep the caps located at least 25 feet from other explosives until they are needed for priming.
2. Do not work with electric blasting caps or other electro-explosive devices while wearing clothing prone to producing static electricity such as nylon, silk, synthetic hair, etc.
3. Do not use explosives or accessory equipment that are obviously deteriorated or damaged. They may cause premature detonation or fail completely.
4. Always point the explosive end of blasting caps, detonators, and explosive devices away from the body during handling.
5. Use only standard blasting caps of at least the equivalent of a commercial No. 8 blasting cap.
6. Use electric blasting caps of the same manufacturer for each demolition shot involving more than one cap.
7. Do not use improvised methods for initiating blasting caps.
8. Do not bury blasting caps. Use detonating cord to transmit the explosive wave from the blasting caps, on the surface, to a buried/tamped explosive charge. Buried blasting caps are subject to unobserved pressures and movement, which could lead to premature firing or misfires.
9. Test electric-blasting caps for continuity at least 50 feet from any other explosives prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be shunted by twisting the bare ends of the wires together. The wires will remain shunted until ready to be connected to the firing circuit.
10. In the event of a misfire when disposing of explosives by detonation, do not approach the disposal site for at least 30 minutes after the expected detonation time, when firing electrically. When conducting non-electric procedures, the wait time will be at least one hour from the expected time of detonation.
11. Items with lugs, strong backs, tail-booms, base plates, etc., should be oriented away from personnel locations.
12. Consideration should be given to tamping the UXO to control fragments, if the situation warrants. Fragments will be minimized not only to protect personnel but also property, such as buildings, trees, etc.
13. Avoid inhaling the smoke, dust or fumes of burning pyrotechnic or incendiary materials. The smoke, dust and fumes from many of these materials are irritating and/or toxic if inhaled.
14. Do not use water on incendiary fires. Water may induce a violent reaction or be completely ineffective, depending on the mixture.
15. Anticipate a high order detonation when burning pyrotechnic or incendiary-loaded MEC. Safety measures for personnel and property must be based upon this possibility.
16. Inert ordnance will not be disposed of, or sold for scrap, until the internal fillers have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert filler, moisture, or air to expand and burst the sealed casings. Venting or exposure may be accomplished in any way necessary to preclude rupture due to pressure from being confined. All requirements of the UXO Procedure for the Management and Disposition for MEC will be met prior to releasing any inert ordnance material.

17. Maintain minimum safe distances between electromagnetic-radiating sources and electro-explosive devices IAW EODB/TM-TO 60A-1-1-12.
18. Do not conduct blasting or demolition operations during an electrical, dust, sand or snowstorm of severe enough to produce atmospheric static electrical charges, or when such a storm is nearby (within 10 miles). Under such conditions, all operations will be suspended or terminated, cap and lead wires shunted, and personnel removed from the demolition area. Demolition operations will also be terminated if visibility becomes less than 600 feet.
19. Loose initiating explosives: lead azide, mercury fulminate, lead styphnate, and tetracene. These explosives manifest extreme sensitivity to friction, heat, and impact. Extra precautions are required when handling these types of explosives. Keep initiating explosives in a water-wet condition at all times until ready for final preparation for detonation. Sensitivity of these explosives is greatly increased when dry.
20. Exercise extreme care when handling and preparing high explosives for detonation. They are subject to detonation by heat, shock or friction.
21. Do not pack bomb fuze wells with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.
22. Photo flash bombs must be handled with the same care as black powder filled munitions.
23. MEC containing white phosphorous will not be detonated into the ground. White phosphorous munitions will be counter-charged on the bottom centerline (CCBC) when possible.
24. A search of the detonation site, after the demo operation, will be conducted to assure complete disposal was accomplished.
25. Do not abandon any explosives.
26. Do not leave explosives, empty cartridges, boxes, liners or other materials used in the packing of explosives lying around where children, unauthorized persons or livestock can get at them.
27. Do not allow any wood, paper or other materials used in packing explosives to be burned in a stove, fireplace or other confined space, or be re-used for any other purpose. Such materials will be destroyed by burning at an isolated location out of doors, with no one allowed within 100 feet of the burning operation.
28. Do not fight fires involving explosive material. Evacuate all personnel to a safe location and secure the area.
29. Know and observe federal, state, and local laws/regulations, which apply to the transportation, storage and use of explosives.
30. Do not permit metal, except approved metal truck bodies, to contact explosive containers.
31. Do not transport metal, flammable, or corrosive substances with explosives.
32. Do not allow smoking, or the presence of unauthorized personnel, in vehicles transporting explosives.
33. Carefully load and unload explosives from vehicles. Never throw or drop explosives from the vehicle.
34. Assure the load is blocked and braced to prevent it from movement and displacement.
35. Do not drive vehicles containing explosives over public highways until all permits and certifications have been obtained from the state enforcement agencies.
36. All routes must be approved in writing prior to transporting explosive materials over public highways.

37. Licensed commercial carriers will conduct the shipment of explosive materials over public highways unless Tetra Tech UXO personnel have been specifically licensed and certified to make the shipment.
38. Never leave vehicle loaded with explosives unattended.
39. Do not store blasting caps, detonators, or other items containing initiating explosives in the same box, container or magazine with other explosives.
40. Store explosive materials in military or ATFE approved magazines only. Ensure the magazines used for the storage comply with quantity distance requirements, for the class of explosive material they contain. Reference documents include: OP-5, TM 9-1300-206, AMCR 385-100, ATFE - Explosives Law and Regulation, ATFE P 5400.7 and 49 CFR.
41. Do not store spark-producing metal/tools in an explosive magazine.
42. Do not permit smoking, matches or any source of fire or flame within 100 feet of an explosive magazine.
43. Do not allow leaves, grass, brush or debris to accumulate within 50 feet of an explosive magazine.
44. Do not permit the discharge of firearms within 300 feet of an explosive magazine.
45. Do not use any alkaline material such as lye, washing soda, or soap to remove TNT exudate. Alkaline materials will react with TNT to render it more sensitive.
46. Do not permit smoking, matches or other sources of fire or flame within 100 feet of an area in which explosives are being handled.
47. Do not expose explosives or devices containing explosive to prolonged exposure to direct sun light. Such exposure can increase sensitivity and deterioration.
48. Ensure all unused explosives are returned to their proper containers and the container closed after use.
49. Do not carry explosives or explosive components in pockets or on the body.
50. Do not insert anything but time fuse or detonating cord into the open end of a blasting cap.
51. Do not strike, tamper with, or attempt to remove or investigate the contents of an electric/non-electric blasting cap, detonator or other explosive initiating device. A detonation may occur.
52. Do not pull on the electrical lead wires of electric blasting caps, detonators or their electro-explosive devices. A detonation may occur.
53. Do not attempt to remove an unfired or misfired primer or blasting cap from a base coupling. There is a high risk of an explosion.
54. Do not allow unauthorized or unnecessary personnel to be present when explosives are being handled.
55. Always point the explosive end of blasting caps, detonators and other explosive devices away from the body.
56. Do not use pull rings or safety pins to lift or handle explosive devices.

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SOP 1
ATTACHMENT 4
DISPOSAL OPERATIONS CHECKLIST

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DISPOSAL OPERATIONS CHECKLIST

FUNCTION	DATE/TIME	SIGNATURE
Senior UXO Supervisor		
Assign Disposal Team		
Brief Disposal Team Review emergency procedures Discuss MEC/MC/UXO to be disposed Describe Disposal procedures		
Inspect Range/Exclusion zone upon completion of operations		
Disposal Supervisor		
Verify Bravo Flag is hoisted (dedicated range)		
Verify roads are closed		
Verify exclusion zone boundaries in place		
Complete health and safety and equipment checklists		
Ensure command center has completed the verification checklist Responsible activity Medical Facility Fire Department Security/Police Department		
Disposal Supervisor tailgate safety brief: Designate emergency vehicles Designate emergency evacuation route Review emergency response procedures		
Verify daily equipment inspection		
Verify detonators are separated from explosives		
Verify area has been evacuated		
Notify command center operations are commencing		
Start Disposal activities		
Inspect shot after designated wait time		
Collect all metal fragments for later disposal		
QC check performed		
Stop disposal activities		
QA check (if required)		
Tetra Tech notify upon completion: NotifyClient Responsible Activity Medical Facility Fire Department Security/Police Department		
Complete MEC/MC/UXO Accountability Log		
Demobilize		
Record data in Explosive Disposal Log		
Demolition supervisor signature:		Date:

TETRA TECH EC, INC.

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SOP 1
ATTACHMENT 5
EXPLOSIVE DISPOSAL LOG

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EXPLOSIVE DISPOSAL LOG

Project Information

Project Name: _____ Start Time: _____

Project _____ Stop time: _____

MEC Disposed of This Date (List items and quantity of each item)

Donor Explosive Used (List types and quantity)

Remarks

Approval

Demolition Supervisor: _____ Date: _____

TETRA TECH EC, INC.

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SOP 2
Purchase, Receipt, and Accountability of Explosives

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1.0 PURPOSE

This document provides procedures for the purchase/receipt and accountability of explosive materials.

2.0 SCOPE

This document contains procedures that are applicable to all TtEC projects involved in the purchase/receipt and accountability of explosives. The procedures outlined in this document are in compliance with 27 CFR 555, Commerce in Explosives.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

All employees are required to follow the minimum requirements listed in this procedure. Any employee may request permission to vary from these requirements if they are in conflict with our corporate "Operating Philosophies," are unsafe, or are not compatible with contract or site-specific requirements. Permission to vary from this procedure must be obtained from the UXO Discipline Lead. All employees are encouraged to submit comments and/or recommendations to improve this procedure.

3.2 Definitions

3.3 General Requirements

TtEC has an ATFE Manufacturer's License (9-WA-033-20-6F-00135), which allows the company and it’s designees to purchase, manufacture, and use explosives on federal property, and in interstate commerce. This license is for MEC disposal work only; general demolition or construction blasting is not covered. Each state will have different regulations regarding explosive permitting; these regulations may or may not be identical to ATFE regulations. In all cases the appropriate state authority responsible for explosive permitting shall be consulted during the project planning phase. Staff members are available to support the PM in the review of State explosive laws and regulations.

With the incorporation of the provisions of the Safe Explosives Act into 27 CFR 555 Commerce in Explosives, a Federal license is now required for both state and inter-state use of explosives. Additional information on the requirements of the Safe Explosives Act is provided in 27 CFR 555.

For this project two senior on-site UXO personnel will be designated as the primary and alternate representative/agent authorized to order, receive and account for explosive materials. The Senior UXO Supervisor will be the primary representative and the UXOSO or UXOQC will be the alternate. State regulations may require that the primary representative/agent obtain a state

explosive license/permit prior to ordering explosive materials. The selection and assignment of these personnel will be made by the UXO Operations Manager.

3.4 Identification and approval of Explosives Representatives

The Project Manager will provide the following information to the UXO Operations Manager.

1. Project Name
2. Project Duration
3. Project Location
4. Senior UXO Supervisor: Name, current permanent address, date and place of Birth
5. Alternate representative: Name, Current permanent address, date and place of birth
6. Explosive supplier: Name, address and telephone number

The Senior UXO Supervisor and Alternates will complete a Personal Declaration of Fitness to Receive, Control and Use Explosives (Attachment 1). This Declaration will be forwarded to the UXO Operations Manager. The UXO Operations Manager will prepare a Certification of Permit, List of Representatives/Agents Authorized to Order Explosive Materials, and Statement of Intended Use (Attachment 2) and forward to the Director of Ordnance Programs for signature. The Director of Ordnance will submit the List of Representatives/Agents Authorized to Order Explosive Materials and Statement of Intended Use to the explosive vendor(s) identified above, with one copy to the project site, and a copy to the UXO Operations Manager. This documentation must be shown to any explosive vendor prior to that vendor providing explosive materials.

3.5 Authorization

Only the primary representative/agent and alternate are authorized access to the magazines for the purpose of issuing and conducting inventories of explosive materials. Explosives are only authorized to be issued to TtEC employees qualified at a minimum as UXO Supervisors as defined in the work plan.

3.6 Purchase Procedure

All required preparations for storage of explosives must be made prior to ordering the explosives. The requirements of the TtEC Procedure, Storage of Explosive Materials, and all applicable state, federal and military/DoD Regulations will be met prior to taking possession of the explosives on the a project site or at a designated storage magazine.

The Project Manager should assure that executed copies of a current Certification of Permit, List of Representatives/Agents Authorized to Order Explosive Materials and Statement of Intended

Use are submitted to the responsible TtEC procurement official along with the purchase request for explosives.

Note: Before ordering explosives from the local vendor, make arrangements for the return of any unused explosive materials. If the return of unused explosives is not possible, and surplus explosives cannot be destroyed by burning or detonation, the representative/agent authorized to order explosives should take particular care to order exact quantities of required explosives to complete the project.

3.7 Record Keeping/Accountability

The following procedures for accountability of explosives will be followed at all sites where explosives are used/stored. These procedures are IAW ATFE regulations, 27 CFR 555.123.

3.7.1 Central Files

Copies of all correspondence, certifications, invoices and current inventories will be maintained at the project site by the Senior UXO Supervisor. Copies of all correspondence and certifications will be maintained by the UXO Operations Manager. At the completion of each munitions response, original documents related to explosive operations, inventories, invoices and accountability will be transferred to the UXO Operations Manager. Copies of these documents will be maintained in the project files. These files must be maintained for a minimum of 5 years per 27 CFR 555.121.

3.7.2 Initial Receipt Inventory

Upon receipt of explosive materials, a complete inventory of the new explosive materials will be conducted with the following information recorded on the form provided in Attachment 3. This form provides the data identified IAW 27 CFR 555.125(a).

1. Date of acquisition
2. Name or brand name of manufacturer
3. Manufacturer's marks or identification
4. Quantity (applicable quantity units, such as pounds of explosive, number of detonators, etc).
5. Description (dynamite, C4, shape charges, blasting caps, etc.), case or lot numbers, serial numbers, or other specific identification of the explosives received
6. Name, address, and license number of the person from whom the explosive who materials were received.

The initial receipt inventory will be completed for each new delivery of explosive materials. The Senior UXO Supervisor will send a copy of each completed inventory to the UXO Operations

Manager for inclusion in TtEC's ATFE Central files. The original will be maintained in the project files at the site until completion of explosive operations when it will be forwarded to the UXO Operations Manager for inclusion in TtEC's ATFE Central files. This information must be recorded no later than the close of the next business day. Forwarding a copy of the initial Receipt Inventory to the ATFE Regional Compliance Officer is not required unless specifically directed by the ATFE Compliance Officer.

3.7.3 Expenditure/Receipt Accountability

A dual system of transaction accountability will be maintained. Two sets of Magazine Inventory Cards (Attachment 4) will be used for each type, size and manufacturer of an explosive item. One copy of the Magazine Inventory Card will remain in the magazine with the explosive items. The second card will be kept in a project Log Book by the Senior UXO Supervisor in the site office. The Magazine Inventory Cards will identify the item by name, date code, type and size and maintain a running balance (date of transaction, gain, loss and balance), with signature accountability for all issues. The magazine cards will remain on-site until demobilization or when all explosives are expended. The primary representative/agent will then forward the original magazine cards with the closeout inventory to the UXO Operations Manager where they will be maintained in the TtEC's ATFE Central files.

3.7.4 Change of Primary Representative/Agent

Upon a change of the primary and/or the alternate representative/agent a complete inventory of all explosive material will be conducted jointly by the outgoing and incoming representative/agent. The results of the inventory will be forwarded to UXO Operations Manager within five (5) working days after the inventory is conducted.

3.7.5 Closeout Inventory

Upon completion of all explosive operations, where all explosives have been used or returned to the supplier, a closeout inventory (see Attachment 3) will be conducted and recorded in the same manner as the Initial Receipt Inventory described above. The primary representative/agent will send the original Closeout Inventory, a copy of all magazine inventory cards and explosive purchase orders to the UXO Operations Manager for maintenance in TtEC's ATFE Central files.

Note: Do not send a copy of the Closeout Inventory to ATFE Regional Compliance Officer unless requested.

3.7.6 Weekly Inventory

The primary representative/agent or alternate will conduct a physical inventory of all explosive stocks on a weekly basis. The originals will be maintained in the project files at the site until completion of explosive operations when it will be forwarded to the UXO Operations Manager for inclusion in TtEC's ATFE Central files. This inventory must be conducted no later than the last business day of the week. The representative will be accompanied by an alternate and the same representative will not sign the inventory on consecutive weeks.

Note: These weekly inventories preclude the requirement for an annual inventory as provided in 27 CFR 555, 125(b)(iv).

3.7.7 Binary Explosive Accountability

Binary explosives are not by definition explosives until mixed. Record keeping requirements of 27 CFR 555 are exempt if the explosive materials are manufactured for our own use and used within 24 hours of mixing at the same site. If the binary explosives are not used within the 24 hour period then by the close of the next business day after use the following information must be recorded per 27 CFR 555123(d):

1. Date of use
2. Quantity (applicable quantity units, such as pounds of explosives, number of packs/sticks, etc).
3. Description (dynamite, kinepak, kinestyk, etc.)

Note: Even though the binary explosives are not considered explosive materials until mixed they will be inventoried and accounted for as though they were explosive materials (including weekly inventories and transaction management with magazine cards).

3.8 ATFE F 5400.4 Form

This form is used to record explosive transactions between ATFE licensees/permitees and non-licensees/permitees. TtEC employees are not authorized to purchase or transfer explosives to/from non-licensees/permitees.

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SOP 2
ATTACHMENT 1
PERSONAL DECLARATION OF FITNESS TO RECEIVE, CONTROL AND USE EXPLOSIVES

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PERSONAL DECLARATION OF FITNESS TO RECEIVE, CONTROL AND USE EXPLOSIVES

CERTIFIED STATEMENT BY EMPLOYEE DESIGNATED TO PURCHASE EXPLOSIVES

I hereby certify that I am authorized to purchase explosive(s) under federal law and answer "no" to each of the following questions.

Are you a fugitive from Justice?

Are you an unlawful user of, or addicted to marijuana or any depressant or stimulant drug or narcotic drug?

Have you been convicted in any court of a crime punishable by imprisonment for a term exceeding one year?

Are you under charges in an indictment or information in any court for a crime punishable by imprisonment for a term exceeding one year?

Have you been adjudicated mentally defective or been committed to a mental institution?

I hereby certify that none of the above mentioned apply to me. I understand that a person who cannot certify that the above are not applicable is prohibited by Federal Law from shipping or transporting any explosive in interstate or foreign commerce or from receiving any explosive which has been shipped or transported in interstate or foreign commerce. I also understand that the making of any false oral or written statement or the exhibiting of any false or misrepresented identification with respect to this transaction is a crime punishable as a felony.

NAME: _____ **SIGNATURE:** _____ **DATE:** _____

ADDRESS: _____

_____

DATE OF BIRTH: _____

TETRA TECH EC, INC.

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SOP 2
ATTACHMENT 2
CERTIFICATION OF PERMIT

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CERTIFICATION OF PERMIT

LIST OF REPRESENTATIVES/AGENTS AUTHORIZED TO ORDER EXPLOSIVE MATERIALS, AND STATEMENT OF INTENDED USE

Tetra Tech is permitted as a "User of High Explosives", (9-WA-033-33-4D-00025), and as a "Manufacturer of High Explosives", (9-WA-033-20-4F-00036) pursuant to 27 CFR 55.41. Attached are copies of the permits.

In accordance with 27 CFR 55.103(c)(2), TETRA TECH authorizes employees listed below to purchase explosive materials on behalf of the Corporation and pursuant to the restrictions contained herein.

NAME	ADDRESS	DATE OF BIRTH	PLACE OF BIRTH

Purchases of explosives by the aforementioned employee(s) is to be made from an U.S. Bureau of Alcohol, Tobacco and Firearms Licensed or Permitted individual/entity only.

The following information is provided to address requirements of 27 CFR 55.103(d)(1):

Intended Use: .

Tax ID Number: 75-2512450

Principal Business Location: 1000 American Rd, Morris Plains, NJ 07950

Local Business Location

- This certification is valid from the date indicated below to the completion of the work at the _____, or December 31, 2003, whichever occurs first.

APPROVED BY: _____ **DATE:** _____

Frank Jones, Vice President of Construction

Attachments: (1) Signed Certified Copy of Permit Number 9-WA-033-33-4D-00025

(2) Signed Certified copy of License Number 9-WA-033-20-4F-00036

TETRA TECH EC, INC.

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SOP 2
ATTACHMENT 3
INITIAL RECEIPT AND CLOSEOUT INVENTORY

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INITIAL RECEIPT AND CLOSEOUT INVENTORY

DATE OF ACQUISITION	MANUFACTURER	MANUFACTURER'S MARKS	QUANTITY	DESCRIPTION	NAME, ADDRESS, LICENSE # OF PERSON DELIVERING EXPLOSIVES

Note: The initial receipt inventory must be recorded no later than the close of the next business day following the date of acquisition. And the closeout inventory must be recorded no later than the close of the next business day following the date of close out.

TETRA TECH EC, INC.

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SOP 2
ATTACHMENT 4
MAGAZINE INVENTORY CARD

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MAGAZINE INVENTORY CARD

LOCATION:	STOCK NUMBER:	LOT NUMBER:

DESCRIPTION:

DATE	DOCUMENT NO.	TRANSACTION	GAIN	LOSS	BALANCE	PRINTED NAME/SIGNATURE

TETRA TECH EC, INC.

SOP 3

Storage of Explosives

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1.0 PURPOSE

This document provides procedures for the proper storage of explosive materials.

2.0 SCOPE

The procedures in this document are applicable to all Tetra Tech EC (TtEC) and subsidiaries ("the Company") work sites where explosive materials are stored.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

All employees are required to follow the minimum requirements listed in this procedure. Any employee may request approval to vary from these requirements if they are in conflict with our corporate "Operating Philosophies," are unsafe, or are not compatible with contract or site-specific requirements. Approval to vary from this procedure must be obtained in writing from the UXO Discipline Lead. Additionally, project related deviations must be covered at the first project review following the authorization to deviate. All employees are encouraged to submit comments and/or recommendations to improve this procedure.

The requirements listed in this procedure are based on federal laws and regulations. They provide guidance for the storage of explosives on both DoD and non-DoD sites. The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATFE) has jurisdiction over non-DoD sites. The Department of Defense Explosive Safety Board (DDESB) has jurisdiction over all explosive storage on DoD installations. Requirements for the storage of explosives on DoD installations are contained in DoD 6055.9 STD and derivative service directives. Storage of explosives on a DoD installation is exempt from ATFE regulations. Some states and local jurisdictions have enacted additional requirements, so check with the appropriate state and local authorities for information regarding these requirements. Compliance with federal law does **NOT** exempt compliance with state and local regulations.

The Safe Explosive Act (SEA) was signed into law on 25 November 2002. There is an exemption to the requirements of the SEA for work performed as a prime contractor for the U.S. Government; however, all provisions of the SEA apply to all commercial work and work performed as a subcontractor on U.S. Government projects. There are five main provisions of the SEA. This act:

1. Identifies prohibited persons categories.
2. Requires explosive samples be provided to ATF when requested.
3. Requires permits for intrastate users of explosives as well as interstate.
4. Provides information for more thorough ATF background checks
5. Requires ATFE inspections at least once every three calendar years

3.2 Administration

Administrative requirements for the purchase, receipt and accountability of explosives are contained in SOP 2: Purchase, Receipt and Accountability of Explosives. The following items have a direct application to storage requirements:

Right of Entry and Examination - Any ATFE Officer may enter, during business hours, the premises and place of storage of any licensee or permitee for the purpose of inspecting any documents, records or explosive materials.

Report of Theft - Any person who has the knowledge of a theft or loss of any explosive material from stock must report that theft or loss within 24 hours of discovery to the ATF by telephoning 1-800-800-3855 and filing form ATFE F 5400.5. In addition, the theft or loss must be reported to the local authorities.

A license or permit (or copies) must be posted and available for inspection at the business premises where explosive materials are manufactured, imported or distributed.

Any person who stores explosive material must notify the authority having jurisdiction for fire safety (e.g. Fire Marshall), in the locality where the explosives are being stored of the type, magazine capacity, and location of each storage site. This notification must be made orally by the end of the business day in which storage commences and in writing within 48 hours.

Administrative requirements for explosive storage on a DoD installation will be in service specific publications, local directives and approved SOPs. Most DoD storage sites are operated by fully staffed ordnance and explosive safety departments that provide oversight for magazine operations.

3.3 Records

Records will be kept IAW SOP 1. Note: All explosives stored in DoD magazines must have an auditable trail. Document all receipts, transfers and expenditures per SOP 2.

Inspection of Magazines. Any person storing explosive material shall inspect magazines at least every seven days. This inspection does not need to be an inventory, but must be sufficient to determine if there has been unauthorized or attempted entry into the magazine, or unauthorized removal of any of the contents of the magazine. This inspection and results should be recorded on the Magazine Inspection Card (SOP 2, Attachment 4).

For DoD magazines, use the locally approved SOP for magazine inspections and record keeping. Prior to utilizing DoD magazines the Senior UXO Supervisor (SUXOS) should conduct a joint magazine inspection with local explosive safety personnel to document and correct discrepancies. A magazine inspection checklist should be utilized to conduct the inspection. Ensure all required placarding, explosive limits and safety precautions are posted and complied with.

3.4 General Storage Information

There are two classes of explosives for non-DoD storage:

Low Explosives - Explosive materials that will deflagrate when confined. Examples are black powder, safety fuze, etc.

Blasting Agents - An explosive material intended for blasting, consisting of a fuel and an oxidizer. When mixed for shipment or use, a blasting agent cannot be detonated, when unconfined, by a No. 8 test-blasting cap.

The Department of Defense uses the international system of classification devised by the United Nations Organization (UNO) for transport of dangerous goods. The UNO classification system consists of nine hazard classes, two of which are applicable to ammunition and explosives, 1 and 6. Thirteen compatibility groups are included for segregating ammunition and explosives on the basis of similarity of characteristics, properties, and accident effects potential. Hazard classifications and compatibility groups must be strictly adhered to for storage on DoD installations.

Class 1 is divided into divisions that indicate the character and associated hazards:

- Mass-detonating (Division 1)
- Non-mass detonating fragment producing (Division 2)
- Mass-fire (Division 3)
- Moderate fire-no blast (Division 4)
- Very insensitive explosives (Division 5)
- Extremely insensitive ammunition (Division 6)

Articles that contain riot control substances without explosive components are classified as **Class 6**, Division 1. However, for DoD purposes, these articles are considered as Hazard Division 1.4 and may be stored in limited quantities with other munitions;

Commercial (Non DoD) explosives **cannot** be stored in a DoD magazine without prior approval.

3.4.1 Non-DoD Magazines

No non-DoD magazines will be used for this project. If the scope changes to include the use of this type of structure the SOP will be amended.

3.4.2 DoD Magazines

Most DoD magazines are permanent magazines that have approved storage limits by type of magazine, hazard classification and NEW. Siting of DoD magazines applies to storage only. Any other activities that take place at the magazine, such as packaging for shipment or assembling explosive charges are considered explosive operations that must also be sited.

When storing explosives in a DoD magazine, use only high security magazine locks provided by the custodial DoD activity.

Portable magazines are commercially built pre-engineered magazines that may be used for storage of all C/D's of ammunition or explosives, although their application is most efficient for storage of C/D 1.3 and 1.4 material. Commercial literature or specifications on the magazines do not qualify the magazines for a particular type storage or explosive limit. The storage compatibility requirements, quantity-distance criteria and siting requirements of DoD 6055.9 must be applied. The term "portable" only denotes a type of magazine. Once a magazine has been sited, its location cannot be changed without resubmission for site approval.

Total containment magazines. (Golan, NABCO), must be sited by DDESB. These magazines must also have DDESB approval letters that specify siting and storage limitations.

Non-DoD magazines used to store explosives or recovered MEC should be Type 1 or Type 2 magazines. These magazines must be sited by either submitting a siting request IAW service directives, or including the siting in the Explosive Safety Submission.

Waivers are written authority to deviate from mandatory explosive safety requirements. They are generally issued for 2 years pending completion of corrective measures to eliminate the waiver requirement. Event waivers are an approved deviation on a case-by-case basis for a particular evolution, issued for a limited period to meet a specific, nonrecurring requirement.

Exemptions are written authority to deviate from mandatory explosive safety requirements for the purpose of long-term satisfaction of recurring readiness or operational requirements. It is generally issued for a maximum of 5 years, but will not be granted for a period in excess of that estimated for correction of the deficiency.

3.5 Storage Requirements, Restrictions and Housekeeping

For magazines on DoD sites, the explosive limits and storage compatibility requirements will be in the magazine siting document or the Explosive Safety Submission (ESS). Storage restrictions and housekeeping requirements will be in service specific directives.

3.6 Placarding and Marking

On DoD installations the firefighting symbol of the most hazardous material present is required outside the storage site. Unless there are security concerns regarding the public identification of the magazine’s contents, a placard must be displayed on the magazine door, and/or down the access road if visibility to the magazine is obstructed. If all material in a storage area is covered by one fire symbol, it may be posted at the entry, control point or access road. If security concerns preclude the use of placarding to identify the contents of a magazine, ensure that appropriate means are put in place for identifying the contents in the event of an emergency or other such need.

3.7 Binary Explosives

Binary explosives may be purchased intrastate or interstate under Tetra Tech's Manufacturer's license. The storage requirements for binary explosives normally do not require special storage

until they are mixed (check applicable state laws and regulations). However, security measures should always be considered. If the Binary materials are purchased within the state where work is being performed, or if that state and an adjoining state have an agreement, then the manufacturer's license may not be required. Each State has different regulations and each situation must be researched prior to ordering and receiving explosive materials.

SOP 4

Transport of Explosives

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1.0 PURPOSE

This document provides procedures for the proper transportation of explosive materials.

2.0 SCOPE

The procedures in this document are applicable to all employees of TtEC and its subsidiaries involved in the transportation of explosive materials.

3.0 MINIMUM REQUIREMENTS

The procedures in this document are in compliance with 49 CFR and Department of Transportation regulations. When transporting explosives on DoD installations ensure DoD component and local procedures are reviewed and complied with. In many cases states and local jurisdictions have enacted their own requirements relating to the transportation of explosives. Check with the appropriate state or local authorities for information regarding state and local laws. Compliance with federal law does NOT exempt persons from compliance with state and local regulations. Whenever possible the transportation of explosives over public roads should be contracted out to a commercial carrier.

3.1 RESPONSIBILITIES

All employees are required to follow the minimum requirements listed in this procedure. Any employee may request approval to vary from these requirements if they are in conflict with our corporate "Operating Philosophies," are unsafe, or are not compatible with contract or site-specific requirements. Approval to vary from this procedure must be obtained in writing from the UXO Discipline Lead. Additionally project related deviations must be covered at the first project review following the authorization to deviate. All employees are encouraged to submit comments and/or recommendations to improve this procedure.

All personnel engaged in the transportation of explosives will be thoroughly trained and properly licensed. They will be capable of recognizing hazardous situations and taking prompt corrective action. Transportation of explosives will not be conducted without client authorization, approved plans/SOPs, and all required forms and documentation.

3.1.1 Responsibilities of the Project Manager

It is the project manager’s responsibility to ensure that the appropriate level of expertise is identified and applied to any hazard or element of work identified in their project. The project manager will also ensure that the procedures contained in this SOP are followed.

3.1.2 Responsibilities of All Employees

All employees are responsible for following the minimum requirements and guidance provided in this document.

3.1.3 Operator Requirements

- The driver will be properly licensed and not be an unlawful user of or addicted to alcohol, narcotics, or other dangerous drugs.
- The driver will report to his supervisor when taking any medication, regardless if prescription or over the counter medication.
- The driver will inspect the transport vehicle prior to loading and transporting Class 1 materials.
- The driver will be familiar with applicable local, state and federal laws and regulations governing the transportation of explosive materials.
- The licensed person or another qualified employee will attend the vehicle transporting Class/Division (C/D) 1.1, 1.2 or 1.3 materials at all times.

3.1.4 Vehicle Attendant Requirements

- Must be physically in or on the vehicle, or have it within his field of vision and be able to reach it quickly without any interference.
- Be awake and alert and not engaged in other duties or activities that divert his attention from the vehicle.
- Be aware of the C/D explosive materials in the motor vehicle and its inherent dangers.
- Be aware of the measures and procedures to be followed in order to protect the public from such inherent dangers.
- Be familiar with the vehicle he is assigned to attend.
- Be trained, authorized and capable of moving the vehicle when required.

Exception to the above attendant requirements: A vehicle laden with Class 1 materials may be left unattended if parked in a "safe haven" IAW the provisions of 49 CFR Part 397.

4.0 General Requirements

When transporting explosives or any hazardous material, it will be properly and accurately documented on shipping papers IAW 49 CFR Part 172.

4.1 Emergency Response Information

The driver will have the following information as required by 49 CFR Part 172, Subpart G:

- Immediate hazard to life and health.
- Risks of fire or explosion.
- Immediate precautions to be taken in the event of an accident/incident.
- Immediate methods for handling fires.
- First aid measures.
- An emergency response phone number.

4.2 Written Route Plan

The driver will have a written route plan that includes all routes to be followed for the transportation of explosives.

4.3 DOT Hazmat Security Plan

The plan consists of activities to be implemented by all shippers and transporters of certain types/amounts of specified DOT hazardous materials (hazmat) that will minimize the risk that the hazmat falls into the wrong hands, either before or during transportation. The main components of the Security Plan are:

- Personnel Security. Measures to confirm the information provided by job applicants.
- Unauthorized Access. Measures to address the assessed risk that unauthorized personnel may gain access to the site and hazmat.
- En-route Security. Measures to address the assessed security risks of shipments of hazmat during transport.

Information of Security Plans can be found in 49 CFR 172.800 and ZIP Bulletin 104. Any questions should be addressed to the appropriate ESQ Environmental Compliance Specialist (or the DOT Hazmat Security Plan Lead at 617-457-8258).

If the public does not have access to the roads on site, a security plan is not required. If the public is allowed onto the roads on site, then the security plan requirements apply. A security plan is required if the transporting vehicle requires placarding.

All Hazmat employees will receive security awareness training. This will be accomplished by having the hazmat employee attend TtEC's DOT Hazardous Materials Transportation training. If a Security Plan is required, the hazmat employees must have "in depth" training on the plan's specifics. A "hazmat employee" is someone who packages, labels, marks and otherwise handles hazmat or supervises hazmat employees who perform these tasks. These employees must be trained to know what security steps to take in the event of a security problem at the site.

Training must be documented and that documentation must kept on site.

4.3.1 Copy of 49 CFR Part 397, This Procedure, and the Emergency Response Guidebook

The driver will have a copy of the Emergency Response Guidebook, this procedure, and 49 CFR Part 397 that includes:

- Transportation of Hazardous Materials.
- Driving and Parking Rules, and
- Federal Motor Carrier Safety Regulations.

4.3.2 State and Local Explosive and Hazmat Transportation Permits

The driver will have all state and local explosive and hazardous materials transportation permits, if applicable.

4.4 Driving Safety

4.4.1 Repairs

Do not take motor vehicles carrying explosive materials, blasting agents or blasting supplies inside a garage or shop for repairs or service.

4.4.2 Fueling

When a motor vehicle carrying hazardous materials is being fueled, its engine will not be running and a person will be in control of the fueling process at the point where the fuel is being dispensed.

4.4.3 Emergencies

In the event of a breakdown or collision, secure the area and promptly notify the local fire and police departments for assistance.

4.4.4 Parking

Except under emergency provisions, no vehicle transporting explosive materials will be parked:

- On or within 5 feet of the traveled portion of a public street or highway.
- On private property (including premises of fueling or eating facility) without the knowledge and consent of the person who is in charge of the property and who is aware of the nature of the hazardous materials the vehicle contains.
- Within 300 feet of a bridge, tunnel, dwelling or place where people work, congregate or assemble.

4.4.5 Smoking

No person will smoke or carry a lighted cigarette, cigar or pipe on or within 25 feet of a motor vehicle that contains Class 1 material.

4.4.6 Fires

A motor vehicle containing hazardous material will not:

- Be operated near an open fire unless the driver has first taken precautions to determine he can pass the fire safely, without stopping.
- Be parked within 300 feet of an open fire.

4.4.7 Routes

Unless there is no other practical alternative, a motor vehicle that contains hazardous materials must be operated over routes that do not go near through heavily populated areas, places where crowds assemble, tunnels, narrow streets, or alleys. Operating convenience is not a basis for determining whether it is practical to operate a motor vehicle IAW this procedure.

Before a motor carrier permits a motor vehicle carrying class 1.1, 1.2 or 1.3 explosives to be operated, he will prepare a written plan of a route that complies with the rules of the preceding paragraph. A copy of this plan will be furnished to the driver of the vehicle. The driver may prepare this plan as an agent of the motor carrier in a place other than the terminal.

4.4.8 Railroad Crossings

- All placarded vehicles must stop at all railroad crossings.
- Stop within 50 feet but no closer than 15 feet.
- Cross the tracks only when it is safe to do so.
- Do not shift gears while on the tracks.
- Stops are not required at:
- Streetcar crossings or industrial switching tracks within municipalities.
- Crossings where a police officer or flagman is directing traffic.
- A crossing, which is controlled by a stop and go traffic light, which is green.
- Abandoned rail lines and industrial or spur line crossings clearly marked "EXEMPT."

4.5 Accidents Involving Explosives

In the event of an accident involving any motor vehicle transporting explosives:

- Every means available will be employed to prevent unnecessary persons from congregating at the accident scene. Unnecessary persons include: those not employed in the protection of people and property, those not needed for the removal of hazards or wreckage or those not responsible for the cargo.
- The same means will be used to prevent people from smoking, to keep flames away, to safeguard against the aggravation of the hazards at hand and to warn others.
- In the event any vehicle carrying dangerous explosive materials is entangled with another vehicle or structure, no attempt will be made to disentangle the wreckage until the explosive material and fragments of the material are removed and placed at least 200 feet from the wreckage and any habitation.
- In the event of a fire involving carrying explosive material, every effort should be made to give a warning of danger of explosion to habitants in the vicinity and other users of the highway. Employees should attempt to fight the fire, with the fire fighting equipment readily available, until such a time as the fire reaches the compartment the explosives are contained in and possible detonation is imminent.

4.6 Emergency Signals and Warning Devices

4.6.1 Signals

Whenever a vehicle carrying explosive materials is stopped on the roadway for any reason other than a normal traffic stop, emergency flashers will be used until proper devices can be placed.

Emergency flashers will also be used during the time warning devices are being picked up prior to moving the vehicle. Emergency flashers may be used at other times the vehicle is stopped in addition to, but not in place of, warning devices.

4.6.2 Warning Devices

Whenever a vehicle is stopped upon the traveled portion of the highway or the shoulder for any reason other than normal traffic stops, the driver will place emergency warning devices out as soon as possible. These warning devices will consist of three reflective triangles, three electric emergency lanterns or three red emergency reflectors. These warning devices shall be placed:

- Within 10 feet of the vehicle in the direction of oncoming traffic.
- At approximately 100 feet in the center of the occupied lane in the direction of oncoming traffic.
- At approximately 500 feet in the center of the occupied lane in the direction of oncoming traffic.

The placement of warning devices is not required within the business or residential district of a municipality, except when available lighting is insufficient to make a vehicle clearly discernible at a distance of 500 feet to persons on the highway.

If a motor vehicle is stopped within 500 feet of a curve, crest of a hill, or other obstruction to view, warning devices will be placed in the direction of the obstructed view at a distance of 100 to 500 feet.

No driver will permit a lit road fire, or other flame producing emergency signal, to be attached to or placed within 50 feet of his vehicle.

4.7 Vehicle Requirements

Vehicles used for the transportation of explosive will be strong enough to carry the load. In addition, these vehicles will:

- Be in good mechanical condition.
- Have tight floors.

When a vehicle, with an open body (pick-up), transports explosive materials, they will be loaded into a portable magazine or closed container and that portable magazine or container will be securely fastened to the truck bed and protected from the elements with a fire resistant tarpaulin, or metal camper type shell with a locking access opening.

Any exposed spark producing metal on the inside of the body, portable magazine, or closed container, will be covered with wood or other non-sparking material to prevent contact with the explosive material. Exposed spark producing metal need not be covered in a vehicle transporting blasting agents and/or oxidizing agents.

Each motor vehicle transporting explosive material will be equipped with fire extinguisher as follows:

- Trucks of less than 14,0000 lbs. GVW rating: Minimum of 2 extinguishers with a total fire extinguisher rating of at least 4-A: 70-B: C
- Trucks over 14,000 lbs. GVW rating and tractor semi-trailer units: Two or more extinguishers with a total fire extinguisher rating of at least 4-A: 70-B: C

Only extinguishers listed or approved by a nationally recognized fire equipment-testing laboratory will be used on vehicles carrying explosive materials. They will be designed, constructed and maintained to permit visual determination of whether they are fully charged.

- Extinguishers will be located where they are accessible for immediate use.
- Extinguishers will be examined and recharged periodically IAW the manufacturer recommendations, and
- Where trucks are operated in temperatures below 0 degrees Celsius, dry powder extinguishers will be pressurized with nitrogen gas.

4.7.1 Vehicle Inspections

A motor vehicle for transporting explosive materials will be inspected each day before use to determine it is in proper condition for the safe transportation, including:

- The fire extinguishers are charged and ready for use.
- All electrical wiring is protected and fastened to prevent short-circuiting.
- Chassis, motor, pan and underside of body is reasonably clean and free of excess oil and grease.
- Fuel tanks, feed lines and crossover lines are secure and have no leaks.
- Brakes, lights, horns, windshield wipers, and defrosters, and steering apparatus are functioning properly.
- Tires have proper inflation and are free of defects.

Tires will be checked for proper inflation and general conditions after each 2 hours of travel or 100 miles, whichever comes first, and at every stop. Flat or overheated tires will be removed from the vehicle immediately. After removal of the tire, it will be placed far enough away from the vehicle so that spontaneous ignition of the tire will not endanger the vehicle or its cargo. The tire will not be placed on the vehicle until it has cooled down below the danger level, nor will it be used again until the cause of its overheating has been corrected.

No metal, tools, oils, matches, firearms, batteries, flammable substances, acids, oxidizing materials or corrosive compounds will be carried on the body of any motor vehicle transporting explosive materials except as permitted by regulations of the U.S. Department of Transportation.

4.7.2 Placarding

- Motor vehicles, when used for transporting any quantity of explosive materials over a public highway, will display the placards and markings required by 49 CFR 172.500 Subpart F.
- Before a placarded vehicle transports explosive materials over public roads a DOT Hazmat security plan must be in the driver's possession.
- Placard vehicles transporting explosive material on both sides and the front and rear.
- When mixed loads are transported, display the placards for the most hazardous cargo.
- Explosive placards will be diamond shape and measure 10-3/4 inches on each side. The placards will be orange with a white border and the symbol and print will be black.

- Further information on class, division, segregation and compatibility of explosive material can be found in 49 CFR 177.848, and 49 CFR 172.504.

4.7.3 Loading and Unloading

The following precautions apply to loading and unloading explosives:

- Load hazardous materials IAW the compatibility and segregation tables in 49 CFR 177.848.
- No bale hooks or other metal tools will be used for the loading, unloading or handling of explosives.
- No package, or other container of explosives, except barrels or kegs, will be rolled.
- No package of explosives will be dropped or thrown.
- Special care will be exercised to ensure packages or containers of explosive material will not catch fire from sparks or hot gasses from the vehicle exhaust tailpipe.

4.7.4 Detonators

Blasting caps, electric or non-electric, contain primary explosives and therefore MAY NOT be transported in the same vehicle with other explosives, unless packed in wooden or fiberboard containers as per 49 CFR 173.63, and 177.835. These containers will then be loaded into portable containers or separate compartments that meet the requirements of the Institute of Makers of Explosives IME-22 standard. Or the MK 663 Container maybe used to transport not more than 10 blasting caps in the same vehicle with other explosives IAW the provisions of 49 CFR 173.7(a). A copy of the Certificate of Equivalency (NA-02-513) must accompany the container. The container will have DOT Marking as: “DETONATORS FOR AMMUNITION”, and will have the “1.4S” DOT Label.

4.7.5 Transporting Explosives with ATVs

No explosives will be transported by ATV.

4.7.6 Transporting Explosives on Boats

No explosives will be transported by boat.

SOP 5

Management and Disposition for Material Potentially Presenting an Explosive Hazard (MPPEH)

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1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish basic procedures for the processing, inspection, certification/verification and final disposition of Material Potentially Presenting An Explosive Hazard (MPPEH). Information contained in the SOP should be used in conjunction with appropriate sections of the approved Site Specific Work Plan (WP) and the approved Accident Prevention Plan (APP). Adjustments to the procedure must be approved by the Project Manager and may require review by the client.

2.0 SCOPE

The procedures in this document are applicable to all UXO employees of TtEC and its subsidiaries conducting MPPEH Processing

The procedures presented in this SOP are IAW the following:

- US Army Corps of Engineers (USACE) Engineering Manual - EM 1110-1-4009 Military Munitions Response Actions, 15 June 2007
- DoD Instruction 4140.62 Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH)

3.0 MINIMUM REQUIREMENTS

All employees executing MEC operations at Fort McClellan will comply with the following procedures for processing MPPEH for final disposition. The objective of these procedures is to ensure that an inspection procedure of the exterior and interior surfaces of all recovered MPPEH is in place to ensure these items do not present an explosive hazard.

3.1 RESPONSIBILITIES

(1) Unexploded Ordnance (UXO) Sweep Personnel will only mark suspected items with a pin flag or other procedure and will not be allowed to perform any assessment of a suspect item to determine its status.

(2) Unexploded Ordnance (UXO) Tech I can tentatively identify a located item as MPPEH, followed by a required confirmation by a UXO Tech II or III

(3) UXO Technician II will:

(a) Perform a 100% inspection of each item as it is recovered and determine the following (see Table 1 MPPEH Classification guide to help determine classification):

- Is the item a UXO, a DMM, munitions debris, or range related debris?
- Does the item contain explosives hazards or other dangerous fillers?
- Does the item require detonation?
- Does the item require demilitarization (demil) or venting to expose dangerous fillers?

- Does the item require draining of engine fluids, illuminating dials and other visible liquid hazardous, toxic or radiological waste (HTRW) materials?

(b) Segregate MPPEH requiring demil or venting procedures from those items ready for certification.

(c) Items found to contain explosives hazards or other dangerous fillers will be processed in accordance with applicable procedures.

(4) UXO Technician III will:

(a) Perform a 100% re-inspection of all recovered items to determine if free of explosives hazards or other dangerous fillers and engine fluids, illuminating dials and other visible liquid HTRW materials?

(b) Supervise the consolidation and the detonation of MPPEH or other items with dangerous fillers utilizing proper venting/demil procedures.

(c) Munitions Debris and Range-related Debris will be segregated**, marked with white paint** and transported to the secure storage area.

(5) UXO Quality Control (QC) Specialist will:

(a) Conduct daily audits of the procedures used by UXO teams and individuals for processing MPPEH.

(b) Perform and document random sampling (by pieces, volume or area) of all MPPEH collected from the various teams to ensure no items with explosive hazards, engine fluids, illuminating dials and other visible liquid HTRW materials are identified as munitions debris or range-related debris as required for completion of the Requisition and Turn-in Document, DD Form 1348-1A.

(6) UXO Site Safety Officer (UXOSO) will:

(a) Ensure the specific procedures and responsibilities for processing MPPEH for certification as munitions debris or range-related debris specified in the work plan are being followed.

(b) All procedures for processing MPPEH are being performed safely and consistent with applicable regulations.

(7) Senior UXO Supervisor will:

(a) Be responsible for ensuring work and Quality Control (QC) Plans specify the procedures and responsibilities for processing MPPEH for final disposition as munitions debris or range-related debris.

(b) Ensure a Requisition and Turn-in Document, DD Form 1348-1A is completed for all munitions debris and range-related debris to be transferred for final disposition.

(c) Perform random checks to satisfy that the munitions debris and range -related debris is free from explosive hazards necessary to complete the Form, DD 1348-1A.

- Basic material content (Type of metal; e.g., steel or mixed)
- Estimated weight
- Unique identification of each of the containers and seals stated as being turned over.
- Location where munitions debris or range-related debris was obtained.
- Seal identification, if different from the unique identification of the sealed container.

(d) The following certification/verification will be entered on each DD 1348-1A for turn over of Munitions debris or range-related debris and will be signed by the Senior UXO Supervisor and the USACE OE Safety Specialist. This statement will be used on any ranges where Range Related Debris is being processed along with munitions debris: "This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, are free of explosive hazards, engine fluids, illuminating dials and other visible liquid HTRW materials.

(e) The following certification/verification will be entered on each 1348-1A for turn over of munitions debris and will be signed by the Senior UXO Supervisor on properties where only munitions debris is being processed: "This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, are inert and/or free of explosives or related materials."

3.2 MAINTAINING THE CHAIN OF CUSTODY AND FINAL DISPOSITION.

(1) The contractor, in coordination with the Corps of Engineers, will arrange for maintaining the chain of custody and final disposition of the certified and verified materials. The certified and verified material will only be released to an organization that will:

- Upon receiving the unopened labeled containers each with its unique identified and unbroken seal ensuring a continued chained of custody, and after reviewing and concurring with all the provided supporting documentation, sign for having received and agreeing with the provided documentation that the sealed containers contained no explosive hazards when received. This will be signed on company letterhead and stating that the contents of these sealed containers will not be sold, traded or otherwise given to another party until the contents have been smelted and are only identifiable by their basic content.
- Send notification and supporting documentation to the sealed container-generating contractor documenting the seal containers have been smelted and are now only identifiable by their basic content. documentation for supporting the final disposition of munitions debris and range-related debris.
- If the chain of custody is broken, the affected MPPEH must undergo a second 100 percent inspection, a second 100 percent re-inspection, and be documented to verify its explosives safety status (identified as either munitions debris or range related debris).

(2) Material that has been documented as safe in no longer considered MPPEH as long as the chain of custody remains intact. A legible copy of inspection, re-inspection, and documentation must accompany the material through final disposition and be maintained for a period of 3 years thereafter.

(3) Material that is still MPPEH after inspection may be released only to a qualified receiver.

a) The following must be accomplished prior to release of the property:

- Ensure that MPPEH that has been documented as hazardous is only transferred or released to those entities that:
- Have the licenses and permits required to receive, manage, or process the materials.

- Have technical experts about the known or suspected explosive hazards associated with the MPPEH.
- Are qualified to receive, manage, and process MPPEH in accordance with DoD Instruction 4140.62.
- Have personnel who are:

(b) Experienced in the management and processing of hazardous materials equivalent to the MPPEH.

(c) Trained and experienced in the identification and safe handling of used and unused military and/or any potential explosive hazards that may be associated with the specific MPPEH.

(d) The receiver must be advised of all of the potential hazards associated with the MPPEH and agree to receive and process the material IAW with DoD Instruction 4140.62.

(e) All MPPEH shipments over public transportation routes must comply with DoD guidance that implements hazardous material transportation regulations.

(f) Ensure that chain of custody and accountability records are maintained through final disposition of MPPEH.

(g) A legible copy of inspection, re-inspection, and documentation must accompany MPPEH through final disposition and be maintained for a period of 3 years thereafter.

Table 1 MPPEH Classification Guide

TETRA TECH EC, INC.

MPPEH CLASSIFICATION GUIDE

Type of Material (1)	What is it BEFORE it is inspected for explosives hazards? (2)		What is it AFTER it is inspected for explosive hazards...					
			and it presents explosive hazards?			and it does not present explosive hazards?		
			MEC					
	MPPEH	Other	UXO	DMM (3)	MC (4)	MC (5)	Munitions Debris	Other (Range Debris/ Cultural Debris)
Used military munition, on a range, fired	X		X				X	
Unused military munition, on a range, apparently discarded	X			X			X	
Used military munition, in a burial pit, on an operational range or on former ranges	X		X (6)				X	
Unused military munition, in a burial pit on an operational range or on former ranges	X			X (6)			X	
Explosives in the soil	X				X (7)	X		
Refrigerator, nails, soft drink cans, old fence wire, etc.		(8)	NA	NA	NA			(8)
Used cartridge cases, from a range, with live unused munitions possibly mixed in	X			X			(9)	
Target from a range (other than small arms range)	X		(10)	(10)	(10)			(11)
Remnants of munitions from an operational range or former range	X		X (12)	X (12)	X (12)		X (13)	
Kicked out military munition from a former open burn or open detonation Ground	X			X (14)			X	
Residual MC in a melt kettle of a former (closed) explosive cast loading Bldg	X		(15)	(15)	X (15)	X		X (16)
Residual MC in a floor drain pipe from an explosives-laden wash water drain of a former (closed) explosives cast loading facility.	X		(15)	(15)	X (15)			X (16)
Residual MC in cracks in floor slab (and in soil underneath floor cracks) in a former explosives manufacturing building	X		(15)	(15)	X (15)	X		X (16)
Small arms bullets or lead particulates in the soil from small arms use at a former small arms range used only for firing small arms ammunition		X (17)	Not Applicable (17)			X		

Note: The examples in this table are not all inclusive. The numbers in the table refer to footnotes that are found on the next page. It is important to read the footnotes, as they provide additional information of importance to understanding.

Footnotes

(1) DoD has been working to standardize terms related to military munitions. The majority of the terms addressed in this matrix apply to the military munitions response program. However, many also apply to other areas (e.g., operational ranges) outside that program.

(2) Before material that is considered MPPEH can be either transferred within or released from DoD, its explosives safety status must be determined (see definition--Documentation of the Explosives Safety Status of Material). The type material involved determines the type of inspection (e.g., visual examination, chemical analysis, X-ray) required. Personnel qualified to determine the status of the particular material being examined must perform required inspections. For example, EOD and UXO-qualified personnel may inspect UXO and DMM during a munitions response or during range clearance activities. A QASAS or certified Wage Grade ammunition operator may inspect steamed-out projectiles at a depot's steam-out operation. A laboratory technician may perform a chemical analysis of soil to determine the percent explosives in the soil.

(3) Munitions generally considered as DMM include: buried munitions; un-recovered kick outs from open detonations; munitions left behind or discarded accidentally during munitions-related activities; munitions intentionally disposed of without authorization during munitions-related activities. Munitions removed from storage for the purpose of disposal that are awaiting disposal are not DMM.

(4) This is MC that is both (a) an explosive; and (b) present in sufficient concentrations to present explosive hazards.

(5) This is MC that is either (a) not an explosive (e.g., lead, beryllium, and cadmium); or (b) an explosive not present in sufficient concentrations to present explosive hazards.

(6) Although military munitions in a burial pit will normally be DMM, some may be UXO. For explosives safety reasons, munitions in a burial pit should be approached as UXO until assessed by technically qualified personnel (e.g., EOD personnel, UXO-qualified personnel) and determined that they are not UXO or that they do not present explosive hazards similar to UXO.

(7) Explosive soil is typically found in sumps and settling lagoons for explosives-laden wastewater, and in and around drainage ditches and pipes that carry the wastewater to such sumps and lagoons.

(8) These items are cultural debris.

(9) After determination of their explosives safety status, used cartridge cases documented as safe would, after any demilitarization required to remove their military characteristics, be available for release from DoD. In additions to these DoD requirements, other regulatory criteria may apply.

(10) A target is a type of range-related debris. Although a target is not MEC, it may contain UXO, DMM, or MC. Prior to its release from DoD control, its explosives safety status must be documented.

(11) A target's explosives safety status must be documented and any demilitarization required to remove its military characteristics must be performed prior to its release from DoD control.

(12) UXO, DMM, or MC may be found on operational ranges and on former ranges (previously referred to as closed, transferring or transferred ranges). An inspection of the material will determine into which category this material falls. For example, if a projectile breaks apart on impact, one could find (a) a sheared-off fuze, which would be UXO or (b) explosive filler, which would be MC, that broke away from the projectile's open body. If during an open detonation of an unserviceable munition that is conducted on an operational range, the donor charge detonates, but the munition being destroyed breaks up, but does not detonate, the remnants of the munition would be DMM or, if explosive residue (e.g., clumps of TNT), MC.

(13) After determination of its explosives safety status, scrap metal from used munitions on a range that is documented as safe would, after any demilitarization required to remove its military characteristics, be available for release from DoD control. In additions to these DoD requirements, other regulatory criteria may apply.

(14) Prudent safety practice is to consider kick outs, which have experienced an unknown environment, to be equally dangerous and managed like UXO until technically qualified personnel assess and determine that they are not UXO or do not present explosive hazards similar to UXO.

(15) Of itself, such material (e.g., mettle kettle, drainpipes, floor slabs) do not present an explosive hazard and would not be classified as UXO, DMM or MC. However, residual MC (e.g., TNT, RDX, HMX) could remain in such material in high enough concentrations to present an explosive hazard.

(16) After determination of its explosives safety status, such material (e.g., mettle kettle, drainpipes, floor slabs) when documented as safe would be available for release from DoD control. In addition to this DoD requirement, other regulatory criteria may apply.

(17) At operational ranges or former ranges used exclusively for live fire of small arms ammunition, some unfired small arms ammunition may be found. Although this ammunition is considered DMM and would be MPPEH, it is not considered to present a significant explosive hazard.