FINAL
WORK PLAN
MUNITIONS AND EXPLOSIVES OF CONCERN
REMEDIAL ACTION UNIT 3 (RAU 3)
CENTRAL VALLEY FLOOR AND WETLANDS (CVFAW)

Former Camp Bonneville Military Reservation,
Vancouver, Washington

July 2012

Prepared for:

Clark County
Public Works Department
1300 Franklin Street
Vancouver, Washington 98666

Prepared under:

Remediation Agreement
Between Clark County, Washington and Weston Solutions, Inc.

Prepared by:

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DCN B0001

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ABBREVIATIONS AND ACRONYMS

APP	Accident Prevention Plan
ATF	Bureau of Alcohol, Tobacco and Firearms
bgs	below ground surface
BCRRT	Bonneville Conservation Restoration and Renewal Team, LLC
BIP	blow-in-place
BRAC	Base Realignment and Closure
CAP	Cleanup Action Plan
CAR	Corrective Action Report
CBMR	Former Camp Bonneville Military Reservation
CVF	Central Valley Floor
CVFAW	Central Valley Floor and Associated Wetlands
DDESB	Department of Defense Explosives Safety Board
DGM	Digital Geophysical Mapping
DID	Data Item Description
DOD	Department of Defense
DQCR	Daily Quality Control Report
ESS	Explosives Safety Submission
FS	Feasibility Study
GIS	geographic information system
GPO	geophysical prove-out
GPS	global positioning system
GSV	geophysical system verification
ISO	industry standard objectives
IVS	instrument verification strip
MD	munitions debris
MDAS	material documented as safe
MDEH	material documented as an explosive hazard
MEC	munitions and explosives of concern
MPPEH	material potentially presenting an explosive hazard
NCR	Non-Conformance Report
NGVD	National Geodetic Vertical Datum
PDA	personal digital assistant
PM	Project Manager
POC	point of contact
PPE	personal protective equipment

ABBREVIATIONS AND ACRONYMS (Continued)

QA	quality assurance
QC	quality control
RAU	Remedial Action Unit
RFP	Request for Proposal
RI	Remedial Investigation
RTK	real-time kinematics
RQ	reportable quantity
SOP	Standard Operating Procedure
SUXOS	Senior Unexploded Ordnance Supervisor
USACE	United States Army Corps of Engineers
UXO	unexploded ordnance
UXOSO	Unexploded Ordnance Safety Officer
UXOQCS	Unexploded Ordnance Quality Control Specialist
WDOE	Washington Department of Ecology
WESTON	Weston Solutions, Inc.

1. INTRODUCTION

1.1 PROJECT AUTHORIZATION

Weston Solutions, Inc. (WESTON) has been contracted under the Clark County Remediation Agreement 2012 to implement the Washington Department of Ecology (WDOE) Cleanup Action Plan (CAP) for phase I, as defined in the Amended Prospective Purchaser Consent Decree (PPCD), at the Former Camp Bonneville Military Reservation (CBMR). The work under this contract is described under the following documents; The Remediation Agreement, Amended Prospective Purchaser Consent Degree (PPCD), WDOE Cleanup Action Plan (CAP) for RAU 3, Environmental Services Cooperative Agreement (ESCA), WDOE approved work plans, Request for Proposal (RFP) 614 (provided in Appendix A) and WESTON's Proposal for RFP 614, The Remediation Agreement specifies the scope of this work to include the removal action of suspected munitions and explosives of concern (MEC), munitions debris (MD), and all other visible metallic items (greater than two inches square) in the Central Valley Floor and Associated Wetlands (CVFAW) to a depth of 14 inches below ground surface (bgs).It also describes the final disposition of the remaining material potentially presenting an explosive hazard (MPPEH).

1.2 PURPOSE AND SCOPE

This work plan describes the technical and operational approach WESTON will use to implement MEC clearance to 14 inches bgs at the CVFAW. The work performed under this work plan comprises a total of approximately 432 acres, approximately 312 acres in the Central Valley Floor (CVF) and approximately 120 acres in the Associated Wetlands (AW). WESTON will provide an archaeological subcontractor (Pioneer Technologies Corporation) for identification and protection of cultural resources. The key work elements covered under the 2012 Remediation Agreement reflect the Clark County RFP 614 and the corresponding WESTON Proposal are as follows:

- Prepare and submit the following documents; Project Management Plan, Quality Assurance Site Plan, Work Plan for the CVFAW, Explosives Safety Submission (ESS), and procure all necessary regulatory permits for the phase I removal action.

- Conduct a subsurface MEC removal to 14 inches bgs of 432 acres of the CVFAW, as indicated in the Remediation Agreement, to include the removal and disposal of any MEC or MD item found in a sub-grid and any non MEC/MD metal items that are greater than two inches square also to a depth of 14 inches bgs.
- Conduct step-out procedures described in the WDOE CAP (Bonneville Conservation Restoration and Renewal Team, LLC [BCRRT, 2010]) to ensure that isolated discoveries of MEC are not evidence of additional areas of concern. "If a MEC or MD item, of a particular (hazardous) military munition is found within a boundary grid of the removal action area, then a new 100-foot-by-100-foot surface clearance grid shall be added adjacent to the boundary grid of concern".
- Remove and/or blow-in-place (BIP) suspected MEC items that may be encountered during site activities.
- Submit a Draft, Draft Final, and Final After Action Report to Department of Defense Explosives and Safety Board (DDESB) and WDOE as required to achieve site closeout.
- Provide technical support for public participation activities as directed by Clark County.

1.3 WORK PLAN ORGANIZATION

This Work Plan was prepared using components of the Army guidance documents, Engineer Manual 1110-1-4009 (U.S. Army Corps of Engineers [USACE, 2007]) and the Data Item Description (DID) MMRP-09-001 (USACE, 2009a). The Work Plan chapters are organized as follows:

Section 1—Introduction

Section 2—Technical Management Plan

Section 3—Field Investigation Plan

Section 4—Quality Control Plan

Section 5—Explosives Management Plan

Section 6—Environmental Protection Plan

Section 7—Property Management Plan

Section 8—Interim Holding Facility Siting Plan for Recovered Chemical Warfare Materiel Projects

Section 9—Physical Security Plan for Recovered Chemical Warfare Materiel Project Sites

Section 10—References

The following documents are appended to this Work Plan:

Appendix A—Request for Proposal 614

Appendix B—Site Maps

Appendix C—Points of Contact

Appendix D—Accident Prevention Plan (APP)

Appendix E—Geophysical Investigation Plan

Appendix F—Contractor Forms

Appendix G—Standard Operating Procedures (SOPs)

Appendix H—Contractor Personnel Qualifications Certification Letter

Appendix I—Explosives Safety Submission

Appendix J—Archaeological Treatment Plan

Appendix K—Permits and Subcontracts

Appendix L—Project Schedule

1.4 PROJECT LOCATION

The former CBMR comprises approximately 3,840 acres and is located in southwestern Washington, approximately 5 miles east of the Vancouver City limits and approximately 3.5 miles north of the city limits of Camas (Figure 1). The former CBMR is approximately seven miles north of the Columbia River. The site is located in Township 2 North and Township 3

North of Range 3 East in the Washington Public Lands Survey system. The CVFAW is one of eight Remedial Work Areas that comprise Remedial Action Unit (RAU) 3 (Figure 2).

1.5 FORMER CAMP BONNEVILLE MILITARY RESERVATION DESCRIPTION

1.5.1 Environmental Setting

Climate

CBMR is situated between the Cascade Mountains to the east and the Coast Range to the west. These two mountain ranges influence the local climate, which is otherwise a mild marine climate, typical of the region. The Coast Range keeps the area from feeling the full effect of the winter storms from the Pacific Ocean. The Cascade Mountains protect the area from the strong temperature contrasts between summer and winter that occur in eastern Washington. The summers in this area are warm and dry. The winters are mild and wet, with an average of approximately 6.1 inches of rain per month during the winter months.

Regional Geology and Physiography

CBMR is situated on the margin of the western foothills of the southern Cascades in the transition zone between the Puget Trough and the Willamette Trough Provinces. The geology of this area generally consists of Eocene and Miocene volcanic and sedimentary rock types overlain by unconsolidated clays, silts, sands, and gravels of the Troutdale Formation (Phillips, 1987).

The area surrounding CBMR is sparsely populated with scattered residences and is used primarily for agriculture and livestock grazing. The nearest town is Proebstel, an unincorporated community about 2.5 miles to the southwest of the western entrance to CBMR.

The two cantonments, Camp Killpack and Camp Bonneville, are located on the valley floor. The remainder of CBMR consists of moderately steep, heavily vegetated slopes that have been used primarily as firing ranges. The valley floor is a relatively narrow floodplain, which ranges from an elevation of about 290 feet National Geodetic Vertical Datum (NGVD) on the western end of CBMR to about 360 feet NGVD on the east. The adjoining slopes rise moderately steeply to elevations between approximately 1,000 and 1,500 feet NGVD along ridge tops within the property boundaries. The entire installation is heavily vegetated.

Surface Water Features

The principal surface water feature in the vicinity of the investigation area is Lacamas Creek, which flows southward from the confluence of two branch streams in the north-central part of CBMR, exiting the installation at its southwest corner. Wetlands extend throughout the CVF along the Lacamas Creek basin.

Geology and Soil

CBMR is situated along the structural and physiographic boundary between the western flank of the southern Cascade Mountains and the Portland-Vancouver Basin. The geology of the CBMR vicinity is known primarily from geologic mapping by Mundorff (1964) and Phillips (1987), a limited number of well logs available from the general area, and a Multi-Sites Investigation conducted by Shannon & Wilson (1999a).

The geology at CBMR can be divided into three general areas that correspond approximately to topographic divisions. The area west of Lacamas Creek is composed of a series of predominantly gravel and semi-consolidated conglomerate layers with scattered lenses and stringers of sand (Upper Troutdale Formation).

Underlying the Troutdale Formation and comprising the area to the north and east of Lacamas Creek are predominantly basalt flows and flow breccia, with some pyroclastic and andesitic rocks that are folded and faulted. The bottomland along Lacamas Creek is composed of unconsolidated silt, sand, and gravel valley fill, with some clay. Because of the thick soil and dense vegetation, faults have not been identified within CBMR (Environmental Science and Engineering, Inc., 1983).

The CBMR soils are mainly low-permeability clays, which results in considerable runoff after storms and occasional minor flooding of Lacamas Creek. Upland soils have mainly developed from basalt and are generally gravel, stone and fairly shallow. Bottomland soils along Lacamas Creek tend to be clay.

Vegetative Cover

CBMR is a heavily wooded area with Douglas fir, western red cedar, western hemlock, and red alder as the dominant tree species. Depending primarily on moisture gradients, the understory is composed of salal, Oregon grape, viney maple, and sword fern (Larson, 1980 and GeoRecon International, 1981). Special-status species present at or near CBMR include the Hairy-stemmed checker-mallow (state endangered species) and Small-flowered trillium (state sensitive species).

Hydrogeology

Limited information is available about the hydrogeology of CBMR. Most prior work throughout the Clark County area has focused on the Troutdale Formation (as described in Mundorff, 1964). CBMR resides over the eastern edge of the Troutdale Formation where it is pinched out by the underlying bedrock.

Groundwater Flow

The localized groundwater flow generally follows local topography toward tributaries and creeks. Groundwater within the shallow alluvium and Upper Troutdale Formation flows horizontally toward Lacamas Creek from upland areas within the Lacamas Creek valley, which encompasses most of CBMR. The general groundwater flow is to the southwest through the Lacamas Creek Valley and groundwater leaves CBMR where Lacamas Creek exits the western boundary of the camp. A small area north of the Lacamas watershed appears to drain west into another watershed.

Mammals and Birds

Several species of small mammals and birds reside on the site including cottontail rabbits, ground squirrels, mice, and shrews. Large mammals such as deer, elk, bears, and cougars are also present at CBMR.

There are also several special-status species present at or near CBMR. Species confirmed at or near CBMR include:

- **Amphibians:** Northern red-legged frog (federal species of concern)

- **Birds:** Vaux's swift (state candidate species) and Pileated woodpecker (state candidate species)
- **Mammals:** Brush Prairie (Northern) pocket gopher (state candidate species)
- **Fish:** Coastal Cutthroat Trout (federal species of concern)

Summary of Cultural and Historic Resources

As a result of BRAC procedures, the Army performed a cultural resources assessment and survey in selected parcels not previously inventoried for cultural resources but considered to have a high probability for prehistoric and/or historic archaeological sites. These areas included the Lacamas Creek valley, Munsell Hill, and the Little Baldy (Bald Mountain)/Buck Creek vicinity in the eastern part of the base (Sadler, 2003).

None of the sites are recommended as eligible for the National Register of Historic Places (Sadler, 2003).

1.5.2 Former Camp Bonneville Military Reservation Mission and Operational History

The Former CBMR was used by the Army for live fire of small arms, assault weapons, artillery, and field and air defense artillery training between 1910 and 1995. Since 1947, CBMR has also provided training for a variety of military and nonmilitary units from the National Guard, Reserves, U.S. Air Force, and federal, state, and local law enforcement agencies. In the early 1950s the Department of Defense (DOD) arranged to lease an additional 840 acres from the State of Washington Department of Natural Resources to expand training possibilities of the post. The facility has also been used for weekend and summer training by the U.S. Army Reserve units in southern Washington and northern Oregon and just before property transfer in October 2006, was a sub-installation of Fort Lewis.

In July of 1995, CBMR was selected for closure under the 1995 Base Realignment and Closure (BRAC) process. Since the CBMR was officially closed, numerous investigations have been conducted by the Army and its consultants in order to characterize the nature and extent of contamination at the site and to develop a plan for potentially transferring ownership. A Local

Redevelopment Authority was initially responsible for determining cost-effectiveness and feasibility of land reuse plans for the CBMR. A land reuse plan was developed and submitted to the Board of County Commissioners (Camp Bonneville Local Redevelopment Authority). The reuse plan called for CBMR to be transferred to the County. In October 2006, the Army transferred ownership of the property to Clark County via a conservation conveyance for remediation and subsequent development as a regional park. Clark County immediately transferred ownership to the Bonneville Conservation Restoration and Renewal Team, LLC (BCRRT). BCRRT held the deed of the property during investigation and cleanup activities at the site from 2006 thru 2011.

Based on an RI/FS and Supplemental RI/FS reports for site-wide Munitions (RAU 3), BCRRT drafted and submitted a draft CAP for RAU 3 to WDOE in May 2009. The draft CAP for RAU 3 was finalized by WDOE in September 2010.

1.5.3 CURRENT AND PROJECTED LAND USE

Current: Since its closing by the US Army in 1995, CBMR has not been actively used with the exception of training for FBI and local law enforcement personnel conducted at the designated FBI Firing Range.

Future: The Camp Bonneville Land Reuse Plan divides the CBMR into a Regional Park and Wildlife Management Area. The planned Regional Park consists of approximately 1,200 acres located between the western boundary of the site and the floodplain of the Lacamas Creek Valley. The park area is designed to provide recreational opportunities for the local community and will be managed by Clark County. The recreational activities proposed in the reuse plan for the Regional Park include, but are not limited to, the following:

- Recreational trails (hiking and equestrian use)
- Group picnic areas and picnic shelters
- Amphitheater and stage (for outdoor school and small local events)
- Meadow area for group picnicking and recreational sports activities
- Restroom facilities
- Tent camping facilities
- Recreational vehicle camping facilities

- Park directors' residences
- Vehicular access roads
- Parking areas
- Native American cultural center at the Bonneville cantonment area
- Environmental Study Area at the southwest corner of the site

The majority (approximately two-thirds) of the CBMR site will be classified as the Wildlife Management Area which includes approximately 2,188 acres. The Wildlife Management Area would be located east of the Lacamas Creek valley. The remaining 572 acres of the CBMR are contained within the original Central Impact Target Area and Central Impact Area, where no public access will be allowed. The CVFAW falls within the area designated for Regional Park.

1.6 MUNITIONS RESPONSE SITE – CVFAW PROFILE

The entire CVFAW covers approximately 432 acres of the former CBMR. The CVFAW was an extensively-used target and training area. Between 1909 and 1995, live and practice munitions including artillery and mortar rounds, shoulder-fired rockets, land mines (practice only), grenades, and small-arms ammunitions were stored and used on the CBMR. Areas of explosive concern identified at the CVFAW include Stokes Mortar Target Area, MEC Disposal Area (Burial Pit), Open Burn/Open Demolition Area, 37-millimeter Artillery/Stokes Mortar Target Area, 2.36-inch Rocket Target Area near the Former Sewage Lagoons, and Rifle Grenade Target Area.

Central Valley Floor

The Central Valley Floor (CVF) comprise the major portion of the proposed regional park that has a gentle topographic slope, and low vegetative cover. Therefore, these areas provide the opportunity to draw people together for informal recreational activities. These areas cover approximately 312 acres along the Lacamas Creek valley floor. The CVF includes both future High Intensity Reuse Areas (e.g., tent camping areas) as well as Accessible Medium Intensity Reuse Areas

Associated Wetlands

Wetlands extend throughout the CVF along the Lacamas Creek basin and total approximately 120 acres. Although part of the CVF, these wetlands are discussed separately due to the existence of sensitive ecological habitats, easily disturbed soils, flora and fauna, additional regulatory agency oversight and work safety concerns (i.e., unstable saturated soil conditions and stream banks).

1.7 PREVIOUS INVESTIGATIONS

Details of previous munitions response and related activities conducted at CVFAW from 1997 to 2009 are presented in RAU 3 RI/FS, Supplemental RI/FS and CAP. A summary of those investigations are listed below:

- **Archives Search Report 1997—**The report outlined the nature and degree to which MEC may potentially be present contamination at CBMR.
- **MEC Site Characterization 1998—**The purpose of this action was to determine the presence and density of MEC at CBMR.
- **Time-Critical Removal Action 1999/2000—**The purpose of this action was to remove all MEC and any MD in the two former M203 rifle grenade ranges TA 8 and TA 9. These ranges totaled approximately 12 acres combined. Both of these ranges are within the CVF. This action was expanded to 19 acres that included a buffer zone around the two former ranges. Geophysical surveys and munitions response removal actions were conducted at TA 8 and TA 9 to a depth of two feet.
- **Instrument-aided Field Reconnaissance 2001/2002—**The action was to confirm the location and characterize any MEC-related characteristics of Areas of Concern and Areas of Potential Concern within the CVF.
- **RAU 3 site-wide munitions cleanup-2006/2009—**During the course of this cleanup, numerous MEC and MD items were found in areas of the CVFAW where they were not anticipated. WDOE required the contractor (BCRRT) to conduct a Supplemental RI/FS. The results of the report determined that a much more thorough cleanup action was needed for the future land use of the CVFAW.

1.8 CLEANUP ACTION PLAN RECOMMENDATIONS

The Final RAU 3 CAP stated that while the Supplemental RI/FS was being conducted, numerous MEC and MD findings were reported in areas of the CBMR where such findings were not anticipated (BCRRT, 2010). These findings lead to the discovery of a number of new target impact areas and waste disposal areas. Analysis of these findings in the Supplemental RI/FS led to the conclusion that additional cleanup actions are required for some areas.

Data show that the CVFAW was extensively used as direct and indirect fire target areas, and an extensively-used training area. The discovery of numerous subsurface anomalies, as well as surface MEC findings led WDOE to the determination that MEC subsurface removal would be necessary. A number of target areas and/or waste disposal areas were discovered during the interim CVF MEC surface removal activities, including;

- Stokes Mortar Target Area
- MEC Disposal Area (Burial Pit)
- Open Burn/Open Demolition Area
- 37-millimeter Artillery/Stokes Mortar Target Area
- 2.36-inch Rocket Target Area near the Former Sewage Lagoons
- Rifle Grenade Target Area
- Associated Wetlands

Each of these specific areas are shown on Figure 3 and described in the CAP. Unless otherwise indicated, the recommended cleanup action in the Final RAU 3 CAP for each of these areas is removal of MEC, MD, MPPEH, and all other visible metallic items (greater than two inches square in size) to a depth of 14 inches bgs (frost depth).

The clearance of the CVFAW is the first of 4 phases of MEC cleanup actions recommended in the WDOE RAU 3 CAP for the former CBMR. The phases of MEC cleanup actions are listed in the WDOE CAP (BCRRT 2010) and defined in the PPCD.

Due to the sensitive nature of the wetlands, MEC surface and subsurface removal in the wetland areas must be conducted in accordance with already established removal technologies as modified with a separate wetland protocol. The wetland protocol will include specific brush

cutting, worker safety, and MEC anomaly investigation procedures to reduce the impact to potentially sensitive habitat. The appropriate governmental oversight agencies will be consulted prior to MEC removal activities in the wetland areas.

2. TECHNICAL MANAGEMENT PLAN

2.1 PROJECT OBJECTIVES

Primary project objective is to remove MEC, MD, MPPEH, and all other metallic items (greater than 2 inches square) to a depth of 14 inches bgs at the CVFAW. This and secondary objectives are listed in section 1.2 (PURPOSE AND SCOPE) of this document.

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2.2 PROJECT ORGANIZATION

The WESTON project team has the technical and administrative abilities required to safely and efficiently complete the 14 inch bgs MEC Removal Action (CVFAW) at CBMR. Mr. George Overby (Project Manager [PM]), will provide overall management of project activities. He will be responsible for WESTON's performance from project inception to completion. All site work activities will be coordinated through the following representatives:

- Mr. Jerry Barnett (Clark County, PM)
- Mr. Greg Johnson (Clark County Munitions Safety Advisor)

Contact information for the above-listed personnel is included in Appendix C. The WESTON PM will interact directly with the Clark County PM and will coordinate all site work activities through communications with WESTON's Senior Unexploded Ordnance Supervisor (SUXOS), Unexploded Ordnance Safety Officer (UXOSO), Unexploded Ordnance Quality Control Specialist (UXOQCS), the MEC Response and Removal Task Manager, and Senior Geophysicist.

As prime contractor, WESTON will lead all management, safety, and quality tasks and we will rely on our subcontractor teaming partners to provide essential project support throughout the removal process. Our dedicated subcontractor teaming partners are comprised of the following firms:

- B&B Brush Clearing, LLC for brush clearing support
- PBS Engineering & Environmental for natural resource management support

- Pioneer Technologies Inc., for consulting regarding lead-impacted soils
- Minister & Glaeser Surveying, Inc for professional survey work

Other subcontracted services for this project include, Timber Supply Explosives Inc. for donor explosives.

The following subsections contain details pertaining to project schedule, submittal requirements, and personnel. A project organization chart for WESTON employees is provided on Figure 4.

2.3 PROJECT STAFF—WESTON SOLUTIONS, INC.

2.3.1 Project Manager

The PM is the primary point of contact (POC) for the project, and has the overall responsibility for the management of project activities. The PM is responsible for interacting with WESTON and Clark County personnel to ensure that the (CVFAW) 14 inch bgs MEC removal action is executed according to the Clark County Scope of Work and WESTON Project Plans. The duties of the PM include:

- Primary POC for Clark County to ensure timely, transparent communication and coordination between the WESTON Team and Clark County; continually seeks customer feedback and adjusts as warranted.
- Allocating and committing resources to achieve project goals.
- Monitoring/controlling project performance, costs, schedules, quality, and safety.
- Preparing monthly status reports and attending internal and client status meetings.
- Assessing/directing subcontractor performance.
- Conducting risk analysis under monthly project review to develop plans of action in event of elements of risk.
- Maintaining the Project Management Plan.
- Overall supervision of the activities and resources to achieve project goals.
- Ensuring on-time completion and approval of deliverables.

- Notifying management of needed resources and obtaining resource commitment.
- Ensuring implementation of project health and safety and quality control (QC) procedures.
- Monitoring daily cost and schedule control.
- Maintaining effective communications with stakeholder POCs.
- Preparing project status reports as required.
- Ensuring Clark County is provided with real-time access to daily production rates and findings, utilizing WESTON's RespondFast® system and TeamLink® website.

2.3.2 MEC Response and Removal Task Manager

The MEC Response and Removal Task Manager is accountable for safe, successful execution and completion of Munitions Response and Removal Action tasks to ensure completion of the contract to satisfy Clark County's objectives.

The Task Manager's responsibilities include:

- Task planning, including development of task plans, reporting, and the storage, handling, and use of explosives and recovered MEC and MPPEH.
- Selecting proper instrumentation and navigational equipment.
- Design and implementation of munitions response and field sampling plans to meet the project's objectives.
- Estimating costs and negotiates with subcontractors to ensure cost-effective services within project budget.
- Conducting all work safely and meeting identified project quality standards.
- Review and submission of daily and weekly job status reports and documentation.
- Scheduling and resourcing of MEC and associated tasks with other on-site tasks to optimize safety, quality, and effectiveness and to achieve milestone requirements, and adherence to the contract schedule.

The MEC Response and Removal Task Manager will work in close coordination with the PM, SUXOS, Geographic Information System (GIS) Analyst, and Senior Geophysicist.

2.3.3 Senior UXO Supervisor

The Senior UXO Supervisor (SUXOS) will be the senior subject-matter expert in the field during the execution of this surface removal. The SUXOS responsibilities include:

- Primary POC with the on-site client team and project team.
- Planning, coordinating, and supervising on-site MEC-related activities.
- Coordinating and supervising on-site subcontractors.
- Implementing procedures and guidance for MEC operations (ensuring compliance with DOD directives and federal, state, and local statutes and codes).
- Inspecting and certifying MPPEH to reclassify as material documented as safe (MDAS) for safe turn-in or disposal.
- Preparing the Daily Activity Report.
- Adherence to the contract schedule.
- Supervising multiple project teams during the MEC removal and MEC-related activities, such as:
  - Unexploded ordnance (UXO) escort for completion of digital geophysical mapping (DGM)/analog geophysical surveys, investigations and removal actions.
  - UXO escort for anomaly avoidance during brush cutting, potential natural resource inspections and land surveying.
  - Demolition activities.
  - Transporting and storing explosive material.

The SUXOS will report directly to the WESTON PM and will have an open line of communication with the MEC Response and Removal Task Manager, UXOQCS and UXOSO.

2.3.4 UXO Safety Officer

The UXOSO will be the single POC for on-site safety issues, and will implement the Site Safety and Health Plan, inclusive of the MEC and hazardous, toxic, and radioactive waste components,

and will verify compliance with applicable safety and health requirements. The UXOSO will be responsible for monitoring compliance with plans, procedures, and regulations relative to the health and safety of employees, project members, land users, residents, and visitors during all site activities.

The UXOSO reports to the WESTON PM for project-specific direction and will have a direct line of communication with the corporate Program Health and Safety Manager for administrative and technical direction on quality and health and safety matters and will maintain an open line of communication with the MEC Response and Removal Task Manager, SUXOS and UXOQCS. The UXOSO will implement the approved ESS and the WESTON UXO safety program in compliance with DOD, federal, state, and local statutes and codes; analyze UXO and explosives operational risks, hazards, and safety requirements; establish and ensure compliance with site-specific safety requirements for UXO and explosives operations; enforce personnel limits and safety exclusion zones for UXO removal operations, UXO and explosives transportation, storage, and destruction; and conduct safety inspections to ensure compliance with UXO and explosives safety codes. The UXOSO has authority to temporarily stop work to correct an unsafe condition or procedure. The UXOSO will meet or exceed the requirements for this position as presented in the DOD Explosives Safety Board (DDESB)-approved "Minimum Qualification Standards" found in Technical Paper Number 18 (TP-18) – Minimum Qualifications for UXO Technicians and Personnel, December 20, 2004 (DDESB, 2004).

The UXOSO is to be physically onsite whenever project-related fieldwork is in progress. If the UXOSO is to be absent from the site, with client approval, an alternative UXOSO will be designated and will be given equivalent responsibilities and authority.

2.3.5 UXO Quality Control Specialist

The UXOQCS will be the single POC for on-site quality issues. The UXOQCS is responsible for conducting QC inspections of intrusive and explosives operations for compliance with established procedures. He will perform daily surveillance of work activities and issue corrective actions, as necessary. He will prepare daily QC reports documenting QC processes and results.

The UXOQCS will be responsible for monitoring site activities for compliance with plans, procedures, and regulations relative to quality in meeting the project statement of objectives. As the UXOQC, he is additionally responsible for:

- Monitoring activities affecting quality during the MEC Removal Activities.
- Ensuring that procedures are being carried out in accordance with established requirements and protocols.
- Understanding WESTON's and the project's requirements (including those related to quality) and the plans and procedures that implements them.
- Performing QC activities.
- Preparing the Daily Quality Control Report (DQCR).
- Monitoring MEC investigation, removal, and demolition activities for compliance with health and safety requirements as established in plans and procedures.
- Coordinates with Project Geophysicist for anomaly resolution.

The UXOQCS is to be physically onsite whenever project-related fieldwork is in progress. If the UXOQCS is to be absent from the site, with client approval, an alternative UXOQCS will be designated and will be given equivalent responsibilities and authority.

The UXOQCS reports to the WESTON PM for project-specific direction and will have a direct line of communication with the corporate MEC QC and Program Health and Safety Manager for administrative and technical direction on quality and health and safety matters. The UXOQCS will maintain an open line of communication with the MEC Response and Removal Task Manager, SUXOS and UXOSO.

2.3.6 UXO Technicians

UXO technicians will be required to perform visual identification, removal, and disposal operations at locations where MEC, MD, MPPEH and other metallic items are detected. UXO technicians will work under the supervision of the SUXOS. The technicians will be responsible for locating, investigating, identifying, removing, and disposing of all recovered metallic debris. In addition, they will be responsible for documenting required information identified in this work

plan. UXO technicians will meet the qualifications of a UXO Technician I, at a minimum, and be under the direct supervision of a UXO Technician III. UXO technicians will meet the requirements of DDESB TP-18, Minimum Qualifications for Unexploded Ordnance Technicians and Personnel (DDESB, 2004).

Composition of the UXO teams will vary according to the type of removal activity. Reacquisition of anomalies identified during the DGM survey will be conducted by separate teams composed of a UXO Technician II and field scientist/geologist or a UXO Technician I. It is anticipated that removal of anomalies and the analog survey will be performed by two 6-person removal teams for the majority of the MEC removal activities, managed by two designated UXO Technician IIIs. For example, an UXO team participating in removal operations may include one UXO Technician III, three UXO Technician IIs, and two UXO Technician Is.

UXO Technician III

The UXO Technician III supervises a project team performing work on this project. The UXO Technician III may also serve in the capacity of Demolition Supervisor during demolition and explosive demilitarization operations. The UXO Technician III is responsible for:

- Supervising the team to which he/she is assigned.
- Providing MEC subject matter expertise to ensure the team's safety and the project's quality.
- Ensuring the team's action is accomplished safely and efficiently.
- Maintaining administrative records related to the team's operations.
- Implementing the work, safety, and quality plans for this project.
- Supervising the conduct of all on-site evaluations directly related to MEC operations.
- Being familiar with the duties of all assigned personnel and being able to perform all of the functions enumerated for UXO Technicians I and II.
- If assigned as a Demolition Supervisor during demolition operations, the UXO Technician III is also responsible for:
  - Training all personnel regarding the nature of materials, hazards, and precautions.

  - Coordinating with the SUXOS to ensure all notifications are completed prior to demolition.
  - Being present and in direct control during all on-site disposal operations.

- The UXO Technician III will report directly to the SUXOS and will have the experience and qualifications required in DDESB TP-18 (DDESB, 2004).

UXO Technician II

The UXO Technician II is the primary MEC worker on the site and performs as part of the team to locate, visually identify, remove, and dispose of MEC, MD, MPPEH, and other metallic items. The UXO technicians assist in documenting information identified in this Work Plan. The UXO Technician II will report directly to the UXO Technician III and will have the experience and qualifications required in DDESB TP-18 (DDESB, 2004).

UXO Technician I

The UXO Technician I is the secondary MEC worker on the site and performs as part of the team to locate, remove, and dispose of MEC, MD, MPPEH, and other metallic items. The UXO Technician I will report directly to the UXO Technician III and will have the experience and qualifications required in DDESB TP-18 (DDESB, 2004).

2.3.7 GIS Analyst

The GIS Analyst, will be responsible for preparing removal grid maps, tracking MEC, incorporating WESTON's RespondFast® database tools, and performing database backups. The GIS Analyst or his delegate will be responsible for creating, maintaining, and providing GIS databases with accompanying metadata in accordance with Federal Geographic Data Committee standards. All submittals to Clark County will be in accordance with DID MMRP-09-007.

Geophysical Personnel

The geophysical team consists of WESTON personnel under the overall direction and technical oversight by the Senior Geophysicist. Implementation of the geophysical survey will be under the direction of the Project Geophysicist. The Project Geophysicist will be responsible for selection and oversight of the geophysical/navigational positioning tools during the MEC

removal. The Project Geophysicist will manage geophysics data collection and ensure data quality, completeness, and integrity in accordance with DID MMRP-09-004 prior to submitting for internal QC. The Project Geophysicist will also be responsible for analyzing anomalies and directing anomaly selection for removal, and for DGM QC verification mapping.

The Project Geophysicist will coordinate with the Senior Geophysicist, GIS Analyst, and SUXOS for field activities. The geophysical team will be responsible for following geophysical SOPs, recording/logging data collection activities, downloading raw data from personal digital assistants (PDAs) and field computers, and maintaining equipment. The geophysical survey team will consist of the Project Geophysicist, with a field scientist or geologist and a UXO Technician II escort. The Project Geophysicist will be responsible for coordinating with the Senior Geophysicist and SUXOS in planning field data acquisition schedules a day in advance and providing daily field summaries of geophysical activities. The Project Geophysicist will coordinate with the UXOQCS for anomaly resolution.

2.4 PROJECT COMMUNICATION AND REPORTING

This section describes the coordination of and communication with stakeholders necessary to ensure the successful completion of the RAU 3 (CVFAW) 14 inch bgs MEC Removal Action at CBMR. Key stakeholders, including Clark County, the WDOE, and the Army BRAC office, will be kept informed of project status, existing or potential problems, and changes required to manage the project. WESTON will promote communication with Clark County and its approved stakeholders by using the secure, web-based TeamLink® system to facilitate electronic data-sharing/communication. TeamLink® provides an organized site for Clark County and its approved stakeholders to post and view project information, provides a means of tracking project action items, and establishes various security levels to control which team members can view, access, and/or manipulate posted information. TeamLink® will provide Clark County and its approved stakeholders with direct, secure, and reliable electronic access to project-specific documents and data from anywhere they have internet access. If information technology security requirements present a problem, a file transfer protocol site will be utilized for data-sharing/communication.

2.4.1 Monthly Technical Progress Reports

Monthly technical progress reports will be posted on TeamLink® for Clark County no later than seven (7) calendar days following the last working day at the end of each month. The report will provide the following:

- Summary information on project execution.
- Details of tasks completed or in progress during the status period.
- The updated project schedule.
- Status of deliverables.
- Identification of issues potentially impeding planned progress or impacting cost and associated mitigation measures.
- Budget information.
- Munitions Response Progress Summary.
- Exposure Data Report in accordance with DID MMRP-09-016, Periodic Status Report (USACE, 2009b).

2.4.2 Daily and Weekly Status Reports

The WESTON UXOQCS will complete, date and sign a DQCR for each day of fieldwork documenting that field day's quality assurance (QA)/QC information. Daily copies will be uploaded electronically to the WESTON TeamLink® project website. The DQCRs will be maintained by the WESTON MEC Response and Removal Task Manager.

The DQCRs will become part of the Quality Control Summary Report, which will be included in the RAU 3 After Action Report. The Quality Control Summary Report will include:

- A concise summary of practices used to meet project objectives.
- A description of nonconformance and corrective actions.
- An evaluation of data quality relative to the project goals.
- A consolidation and summary of daily events of significance.
- Deviations from the planned activities and procedures.

- Process records and results of data validation.

Weekly status reports will be provided on the WESTON TeamLink® project website for the Clark County PM by the third workday of the following workweek, while fieldwork is underway. The weekly status report will include a summary of the previous week's daily reports in accordance with DID MMRP-09-016, Periodic Status Report. In addition, WESTON will post daily and weekly status reports on the WESTON TeamLink® project website by the third workday of the following work week. For periods of work not involving field work, the status reporting period will not exceed one month.

2.4.3 Phone Conferences/Informal Site Meetings

Telephone conferences and informal site meetings with Clark County will be documented appropriately through follow-up email and summaries in the monthly status reports. Only the Clark County PM can provide official direction to WESTON.

2.4.4 Kick-Off Meeting and Entrance and Exit Briefings

WESTON will support the flow of information between team partners throughout the RAU 3 (CVFAW) MEC 14 inch bgs removal action. WESTON will participate in all of the required the meetings and briefings. The kick-off meeting included Clark County (Jerry Barnett, Greg Johnson and Warren Fjeldos), WDOE (Ben Forson and Ronnie Johnson), and BRAC (Scott Armstrong), and WESTON (George Overby, Tony Clark, Tim Sanford, Melissa Mayer, and Matt Gifford).

2.4.5 Regulatory Negotiations

All regulatory coordination must be approved by the Clark County PM. The WESTON PM will provide the necessary support to initiate, schedule, and address all regulatory aspects of the project (e.g., organizing discussions with regulators concerning site response objectives and completion requirements, obtaining regulator comments on site documents and appropriately addressing them, and obtaining written documentation of investigation completion from the regulators for the CVFAW). The Clark County PM, or designee, will attend and represent the County at all meetings with the regulators. WESTON will prepare and submit minutes for all

significant meetings attended. The Clark County PM will be the signature authority for all regulatory agreements and investigative documentation.

2.5 PROJECT DELIVERABLES

The major project deliverables include:

- Work Plan (including the Project Management Plan, Quality Assurance Site Plan, APP, Activity-Based Schedule, archaeological approach, and permits) for the 14 inch bgs MEC removal action activities
- Explosive Safety Submission
- After Action Report for the 14 inch bgs MEC removal action

Documents will be produced in draft, draft-final, and final versions in both hard copy and electronic PDF. The PDF will have optical character recognition in accordance with the USAEC Repository of Environmental Army Documents requirements. WESTON will provide up to 12 copies of each submittal.

Once initial comments are addressed, the Clark County PM will review draft-final documents before submission to appropriate regulatory agencies. All documents will be identified as draft final until completion of stakeholder coordination, when they will be signed and finalized. One copy of the final documents will be placed in both the project repositories.

2.6 PROJECT SCHEDULE

A project schedule is provided in Appendix L and shows the project tasks, deliverables, and milestones. Changes to the project schedule are likely to occur, and updated schedules will be submitted to the Clark County PM with the monthly status reports. Copies of the schedules will be kept at the site office and posted to the WESTON TeamLink® project website.

2.7 PUBLIC INVOLVEMENT

WESTON will not make available or publicly disclose any data or report generated under this contract unless specifically authorized by Clark County. If any person or entity requests

information on work being conducted hereunder, WESTON will refer them to the Clark County PM. All reports and other information generated for this work will become the property of Clark County.

WESTON will support Clark County, upon request, for public and stakeholder meetings and, at the direction of Clark County, be available for stakeholder interaction that can contribute to positive project communications and cooperation.

2.8 SUBCONTRACTOR MANAGEMENT

The WESTON team includes the following subcontractors to meet the specific needs on this project:

- B&B Brush Clearing, LLC for brush clearing support
- PBS Engineering & Environmental for natural resource management support
- Pioneer Technologies Inc., for consulting regarding lead-impacted soils
- Minister & Glaeser Surveying, Inc. for professional survey work

Other subcontracted services for this project include, Timber Supply Explosives Inc. for donor explosives.

2.9 MANAGEMENT OF FIELD OPERATIONS

During field operations, WESTON will use existing buildings at CBMR for field offices for the (CVFAW) 14 inch bgs MEC removal action field activities. Field operation safety and quality will be monitored by the UXOSO and UXOQCS. Prior to field activities for the MEC removal, a Professional Archaeologist will conduct archaeological awareness training for the entire Remediation Team to minimize impacts to cultural and biological resources.

Daily safety and technical briefings will be conducted at the site office. Mobile storage units may be utilized to store equipment and supplies.

3. FIELD INVESTIGATION PLAN

3.1 OVERALL APPROACH TO MEC RESPONSE ACTIVITIES

The overall MEC Response approach at the CVFAW includes the following phases of work.

3.1.1 Field Preparatory Activities

Prior to the complete mobilization of UXO teams preparatory activities will be conducted, including:

- Establish semi-permanent survey monuments and/or control points and professional Survey of CVF border
- Brush cutting
- Instrument-aided 3 inch surface removal
- DGM, anomaly reacquisition and investigation
- Analog investigation and removal
- Soil excavation, stockpiling, and sifting

Semi-permanent survey monuments and/or control points

WESTON will ensure that all location surveying and mapping are performed under the direction of a Professional Washington Surveyor licensed in the State of Washington and that all activities are conducted in accordance with DID MMRP-09-007 and the approved work plan, accepted by all stakeholders. The Professional Land Surveyor will locate and/or establish a minimum number of control monuments to ensure that data quality objectives are achieved. MEC and non-MEC anomaly locations will be identified to the nearest .5-foot (at the most) during anomaly excavation. WESTON will utilize a Professional Land Surveyor to stake in the border of the CVF to within 1-foot accuracy to ensure completion of the CVF.

Brush Cutting

WESTON will remove vegetation that will interfere with reacquisition and intrusive investigation activities prior to conducting the preparatory 3 inch bgs surface clearance and

DGM survey. Vegetation removal will be minimized as appropriate and allowable to meet project goals. UXO Technician II personnel assisted by analog instruments will survey accessible portions of the work areas ahead of the brush-cutting crews to identify MEC items that may be present on the surface or within the vegetation. A magnetometer is used to aid in searching the vegetation for surface MEC before cutting vegetation. Surface MEC encountered by the brush-cutting team will be marked by a UXO Technician. The MEC item will be left in place and the SUXOS will be notified to coordinate the safe removal of the MEC item.

WESTON will prioritize removal of vegetation in the wetlands, upon approval of permits, to ensure that the vegetation task can be completed during the dry season. Our schedule will take into account Clark County's considerable annual rainfall, when planning brush cutting in the wetlands. Our work schedule is designed to minimize impacts to the wetlands by completing the work in a short period before the soils are saturated or inundated. A separate wetlands protocol will be submitted later after a collaboration between Clark County, The Department of Ecology and Weston Solutions, Inc. We plan to begin the vegetation cutting in mid-June in the grasslands of the CVF and in August in the Associated Wetlands to mitigate potential damage to occupied bird nests (i.e., eggs or chicks). Wetlands and riparian areas are some of the best habitats for bird nesting, so the likelihood of finding a nest, particularly in shrubs and trees, during the nesting season is high. By August and September, most young have fledged and left the nest, and no nesting occurs during winter. Destruction of occupied bird nests is a violation of the Migratory Bird Treaty Act.

Brush-removal crews will use a combination of mechanical and manual equipment to remove vegetation to a level of approximately six inches above ground surface. The maximum diameter of a tree to be cut during brush cutting is six inches.

Upon completion of vegetation removal activities, WESTON will initiate a preparatory 3-inch bgs surface clearance prior to the DGM survey and removal activities as described in the following sections.

3.1.2 MEC Removal

Prior to removal activities, all non-essential personnel will be evacuated from the area in accordance with the appropriate minimum separation distance as presented in the ESS (Appendix I). An exclusion zone will be established with barricades and/or signage, stating "Munitions Investigation Do Not Enter". MEC removal activities will be conducted using techniques appropriate for the location and terrain within the CVFAW as follows:

- Completions of Professional Survey of the border of the CVF
- Continued Brush clearance and vegetation removal as necessary
- Continued Instrument—aided analog surface to 3 inches clearance prior to DGM
- DGM surveys and step out grids
- DGM survey and Removal (surface and 14 inches subsurface)—where terrain permits use of DGM equipment
- Analog Investigation and Removal (surface and 14 inches subsurface)—using hand-held analog detectors where terrain precludes the use of DGM equipment
- Soil Excavation, Stockpiling, and Sifting—where DGM survey and analog investigations are not feasible or adequate

Physical removal of 100 percent of any MEC or MD items found in a sub-grid and any non MEC/MD metal items that are greater than 2 inches square to a depth of 14 inches bgs will occur within the CVFAW either following completion of the DGM survey, or, in conjunction with the analog investigation.

Instrument-Aided 3 Inch BGS Removal

An analog instrument-aided surface clearance will be conducted after vegetation removal and prior to DGM survey to remove surface MEC/MPPEH/MD to 3 inches bgs. The surface removal will be accomplished using analog detection methods consistent with those in the anomaly investigation and removal areas, but will only include subsurface anomaly investigation and removal to three inches bgs. Removal of surface MEC/MPPEH/MD and metal greater than 2 inches square will occur in real time as UXO teams progress across grids. CBMR-specific SOPs

detailing the methodology, procedures, and equipment for the instrument-aided surface removal are provided in Appendix G.

Digital Geophysical Mapping

DGM surveys will be conducted where terrain is amenable to the use of an EM61-MK2 in sled/cart mode or carried in a litter configuration. A single UXO Technician II will provide avoidance escort to the geophysical personnel during the mapping activities. Digital Geophysical instrumentation will be deployed across the land surface along paths within a survey grid a nominal size of 250,000 square feet (500 by 500 feet). Spacing of the survey paths will be tailored to the resolution of equipment and designed for 100 percent coverage; generally no more than a maximum of three feet. If DGM equipment cannot be moved across a grid due to an imminent hazard from surface MEC, then the area will be re-acquired after the surface MEC has been cleared to complete the survey. Details of the methodology, procedures, and equipment for the DGM survey are provided in the Geophysical Investigation Plan in Appendix E.

DGM Anomaly Reacquisition and Investigation

After processing the DGM data, the geophysicist will provide dig sheets and companion color grid maps showing the location of target subsurface anomalies to the Anomaly Selection Board. The UXO dig teams will reacquire those subsurface anomalies using real-time kinematics (RTK) global positioning system (GPS) or Line and fiducial and then intrusively investigate to the depth of 14 inches bgs using hand tools. Earth-moving machinery such as a backhoe may be used to assist in removing the overburden within 12 inches to the side of the anomaly then hand tools will be used to remove the remaining overburden. The excavation will not be backfilled until the spoils have been checked and verified not to contain MEC/MD or other metal debris. Detailed information is provided in the Anomaly Reacquisition and Excavation Procedure SOP in Appendix G.

Analog Investigation and Removal

Anomaly investigation and removal will consist of an analog investigation and removal in which UXO-qualified personnel will investigate and clear all anomalies detected to 14 inches bgs in the grids. A UXO Technician III will closely monitor the performance of each technician to assure

the diligent and comprehensive search of 10,000 square-foot sub grids (100 feet by 100 feet). Line spacing intervals within the grids will be divided into search lanes that are suitable for the equipment and terrain. The search lanes will be optimized based on site conditions and lanes will be delineated with line, flags, marking paint and/or marking tape. The search lanes will be no less than three feet and no more than five feet wide. If an area is deemed inaccessible or unsafe for travel, the UXO Technician III will note the location, record coordinates that bound the location and the reason(s) the site could not be accessed and notify Clark County and WDOE to validate. As the technicians move forward, they will accomplish 100 percent coverage of each analog removal area. MEC/MD/MPPEH and metal items greater than two inches square to a depth of 14 inches bgs, will be removed by UXO teams.

The locations of MEC will be documented using RTK-GPS. Intrusive investigation and removal of anomalies will be performed in real time as the UXO team progresses across the grid.

Soil Excavation, Stockpiling, and Sifting

The intent of soil excavation stockpiling and sifting is to remove the MEC, MD and other masking debris from areas with conditions that preclude DGM and analog surveys. The following sub-sections describe, in sequential order, the activities that will be conducted during soil excavation, stockpiling, and sifting operations. These activities may be performed concurrently within different sections of the CFVAW. Detailed information is provided in the Soil Sifting SOP in Appendix G.

The actual area(s) containing significant amounts of potential subsurface UXO requiring the use of this removal process will be confirmed during remediation. MEC removal that includes sifting soil could cause significant temporary environmental impacts, including loss of listed species, seed bank, or critical habitat. The seed bank will be preserved by excavating the top six inches and sifting and stockpiling it separately from any additional soil excavated for sifting. The depth of the soil excavation for sifting will be confirmed during remediation.

Soil Excavation and Stockpiling

The UXO Teams will maintain records of all MEC/MPPEH recovered on the project. These records will be kept using the RespondFast® electronic data entry program on a hand-held PDA.

Data entered into the PDA will be transferred to a computer and project database each day and subsequently loaded into the project GIS so that all anomaly information is contained in the project GIS.

Excavation will be conducted with hand tools such as shovels to excavate the soil from the areas identified for this activity. If a large amount of soil is covering the area, a backhoe may be used to assist in removing the overburden within 12 inches of the anomaly source then hand tools will be used to remove the remaining overburden. Soil from each area will be stockpiled separately to allow the data from soil sifting to be recorded by area of origin. However, sifting of each stockpile is to take place on the same day or no later than the next work day if excavations are conducted near the end of a work day.

A series of soil lifts may be required with instruments checks conducted to verify adequate debris removal. If multiple soil lifts are required, the soil excavated below approximately 6 inches will be stockpiled and sifted separately from the top 6 inches to allow the seed bank to be subsequently replaced on top of the excavation areas.

Sifting

Soil sifting may be conducted in accordance with the Soil Sifting SOP (Appendix G). The UXO Teams supporting the sifting operations will maintain records of all MEC/MPPEH recovered on the project. These records will be kept using the RespondFast® electronic data entry program on a hand-held PDA. Data entered into the PDA will be transferred to a computer and project database each day and subsequently loaded into the project GIS so that all anomaly information is contained in the project GIS. Annotations will be recorded for MEC/MPPEH Annotations will include site name, grid number, and type of item (i.e., UXO, discarded military munitions) description, weight, and subsequent actions taken. All items located will be initially classified as MPPEH until the items are fully inspected and can be identified as MEC, MD, or metal scrap/cultural debris. If MEC items are encountered that are suspected of containing unknown filler, MEC disposition will be conducted in accordance with the SOP for MEC with Unknown Filler presented in Appendix G. Data collected will also include weight of MD recovered, weight of cultural debris recovered, and final disposal location of the various materials processed.

The non-MEC items will be transported to an approved off-site facility. The final sifted material will be returned to the original excavations.

3.1.3 Identification of MEC

For explosives and chemical safety reasons, the correct identification of recovered munitions is required before destruction or disposal. After encountering a suspected MEC item, the UXO-qualified technician will clear debris/dirt from around the item only enough to permit identification. For MEC/material documented as an explosive hazard (MDEH) determined by the UXOSO and SUXOS to be acceptable to move, the items will be relocated to the demolition site for disposal or stored for later disposal. MEC deemed unacceptable or unsafe to move will be BIP using sand bag mitigation.

3.1.4 MEC DISPOSAL

MEC will be BIP if determined to be unacceptable to move by the SUXOS and UXOSO. Munitions that have been determined acceptable to move by the SUXOS and UXOSO may be relocated to the demolition site for disposal or stored for later disposal. Access routes and detonation areas will be inspected prior to commencing any demolition activities. All Detonations will take place in the Central Impact Target area except those detonations that require BIP operations as described above. The approved demolition site is discussed in detail in the ESS (Appendix I).). An exclusion zone will be established with barricades and/or signage, stating “Munitions Investigation Do Not Enter”.

WESTON will conduct demolition activities on an as-needed basis and in accordance with the approved ESS, (Appendix I) of this Work Plan and the Demolition SOP, (Appendix G). Demolition activities will follow the requirements of Technical Manual 60A-1-1-31, Engineering Manual 385-1-97, applicable Bureau of Alcohol, Tobacco and Firearms (ATF), and federal, state, and local regulations. Upon discovery of MPPEH or MEC requiring demolition, the SUXOS will notify the WESTON MEC Response and Removal Task Manager and Clark County Munitions Safety Advisor immediately.

Material Potentially Presenting an Explosive Hazard

WESTON UXO technicians will inspect MPPEH to determine whether an item/material is MEC, MDEH or MDAS. WESTON will classify items of undetermined explosive hazard as MDEH and will dispose and/or vent the item with other demolition shots. MDEH will be disposed of by detonation using the standard demolition procedures outlined in TM 60A-1-1-31 and procedures described in Section 3.19, MEC Disposal, of this Work Plan and the Demolition SOP in Appendix G.

Personnel Responsibilities

Personnel responsibilities will be as follows:

- UXO Technicians II: Check, classify, and segregate MD as they are recovered.
- UXO Technicians III: Re-inspect all MD, as it is loaded for transport to the MDAS holding area.
- The UXOQCS:
  - Conducts daily audits of the procedures used by the UXO teams and of the MPPEH handling process.
  - Randomly inspects and documents a minimum of 10 percent of the MDAS being processed to ensure the handling procedures are being followed.
  - Performs or witnesses the 100 percent re-inspection.
- The UXOSO:
  - Ensures that the specific procedures for MPPEH are being followed, performed safely, consistent with applicable regulations, and in accordance with the Work Plan.
  - Performs random checks to ensure that MDAS is being handled correctly.
- The SUXOS:
  - Ensures that the specific procedures for MPPEH processing are being followed, performed safely, consistent with applicable regulations, and in accordance the project Work Plan.
  - Performs random checks to ensure that MDAS is being handled correctly.
  - Performs or witnesses the 100 percent re-inspection.
  - Certifies that MDAS is free from explosive hazards.
  - Takes responsibility for ensuring that the inspected materials are secured in locked containers while awaiting shipment off-site.

- Ensures that prior to shipping material off-site, the inspected materials are in a closed, labeled, and sealed container and documented as follows:
    - Unique label including "CBMR/CVFAW/WESTON/Container No. (e.g., 0001)/Seal Number."

MDAS scrap metal collected during MEC investigations will be inspected and disposed of at an off-site recycling facility in accordance with governing regulations. Table 2 presents the munitions observed at the CVFAW.

3.2 DATA MANAGEMENT

A data manager designated by WESTON will be responsible for consolidation, organization, and storage of data collected during this project.

3.2.1 Data

Data include both field and technical data that will be collected during the (CVFAW) 14 inch bgs Removal Action. No samples will be collected for laboratory analysis during this project. Objective data include total number and types of MEC items collected for disposal. Subjective data include certain descriptions and observations of MEC items. Data generated will generally consist of the following categories of information:

- MEC removal and disposal data
- Maps, site plans, sketches, cross sections, and tables
- Field notes

These data may be stored in electronic files or archived as hard copies.

3.2.2 Filing System

A project file will be maintained by the WESTON MEC Response and Removal Task Manager documenting the (CVFAW) 14 inch bgs Removal Action. The file will contain the following information:

Pertinent Project Communications:

- Internal

- External

Various QC and/or QA Documentation:

- Procedures
- Field Change Request forms
- Non-Conformance/Corrective Action Reports (CAR)
- DQCRs

Field Technical Information:

- Field Data
- Field Reports
- Data Review Write ups
- Data Quality Evaluation Forms
- Calculations/Evaluations
- Regulatory Compliance Information
- Management

Project Management Data:

- Schedule
- Budget
- Progress Reports

Health and Safety:

- Plans/Procedures
- Audit Reports
- Daily Health and Safety Forms
- Project-Related Documents
- Plans
- Reports
- Relevant Publications

Files will be kept for a minimum of six years after termination of the work order. The Clark County PM will be notified 60 days prior to the destruction of any files.

3.2.3 Data Location, Numbering, and Maintenance

The WESTON PM will maintain all project files. The files will be numbered with a unique project number, and include subheading information indicating the type of file (e.g., plans, audit reports, et cetera). Files documenting project activities will be checked for completeness, peer-reviewed, and include Professional Engineer and Professional Geologist signatures where appropriate, before being included in the project file.

4. QUALITY CONTROL PLAN

4.1 STANDARD QUALITY CONTROL PROCESS

It is WESTON's policy to apply sound and cost-effective quality principles to all of its activities. This policy assists in ensuring the proper execution of work, the management of liability, and the maintenance of WESTON's professional reputation for excellence. The quality policies established within this Work Plan and its implementing plans and procedures are applicable to all participating project personnel and subcontractors. The plan is applicable to all site activities affecting quality, including, but not limited to, MEC investigation and removal, demolition operations, handling of demolition materials, and data management. Regardless of subcontractor or teaming agreements, WESTON is solely responsible for the control of quality and for providing Clark County with services and deliverables that conform to contractual requirements.

This Quality Control Plan identifies quality requirements to ensure that overall project activities are accomplished using an acceptable level of internal controls and review procedures. The intent of such controls is to eliminate conflicts, errors, and omissions and to ensure the technical accuracy of deliverables.

4.1.1 Logs and Records

For all site work where PDAs are used, observations will be noted that might affect the quality of data. The UXOQCS inspects all grid operations records on a daily basis. These inspections focus on the completeness, accuracy, and logic of the records. The results of these inspections are entered directly into the project database. The following sections discuss the types of records expected to be prepared and maintained for this work. Examples are provided in Appendix F.

Field activities affecting QC will be performed in accordance with documented procedures identified in the Work Plan or applicable SOPs. During field activities, WESTON may use any or all of the reporting forms included in Appendix F and additional forms and reporting media as necessary.

- Daily Site Health and Safety Meeting Report
- DQCR (submitted on a daily basis during field work)

- Quality Assurance Audit Checklist and Audit Form
- Daily Equipment Checklist
- Health and Safety Compliance Inspection
- Site Visitors Logs

4.1.2 Anomaly Excavation Records

The UXO Team Leaders prepare individual records for each operating grid. This record consists of fields that are used to record data on the excavation of anomalies and work conducted. These data are downloaded daily into the project database through synchronization of the UXO Team Leader's PDA. The following workday, these data are reviewed by the SUXOS and UXOQCS for completeness, accuracy, and overall quality.

4.1.3 Daily Quality Control Reports

DQCRs will be prepared daily during field activities. The UXOQCS will prepare a DQCR (Appendix F) including, as a minimum, the following information:

- Preparer (name and signature) and date.
- The criteria for and results of any inspection, surveillance, or review performed (attach inspection or surveillance forms as applicable).
- The results of any review of submittals or other items.
- The results of QC inspections of grids and transects.
- Any significant issues or open items.

The UXOQCS will maintain a field logbook of all inspection and testing activities. This daily logbook will be used in preparing the recurring reports and deliverables and the project report.

4.1.4 Safety Log

Safety logs will be maintained in accordance with requirements of the APP (Appendix D) and retained in the project files for inclusion in the After Action Report. The UXOSO will prepare a log including, as a minimum, the following information:

- Preparer (name and signature) and date.
- Weather conditions, discussion of any incidents, accidents, or significant site events that may impact safety, and stopping work because of safety issues.
- Signatures of all project personnel and visitors acknowledging that they have participated in a safety briefing.

The UXOSO will prepare Daily Site Health and Safety Meeting Reports.

4.1.5 Training Records

The UXOSO maintains training records for all site personnel. These records contain training certificates, licenses, and other qualifying data for an individual's duty position.

4.1.6 Site Visitor's Log Book

The Clark County Range Control maintains the site visitor's log. All personnel who are not directly involved in the project site activities are identified in this log by name, company, date, time in/out, and a contact phone number. Safety briefings and training for visiting personnel are also recorded in this log.

4.1.7 Photographic Log

The data manager maintains the photographic log. The log will be maintained to correspond with the data and daily activities.

4.1.8 Correspondence Log

The office administrator generates individual correspondence numbers for all outgoing correspondence and maintains a log of all outgoing and incoming correspondence.

4.2 QUALITY CONTROL INSPECTION PROCESS

Field performance will be evaluated to ensure that the quality standards and objectives of the Work Plan are met. The evaluation of field performance will be accomplished through audits of the DQCRs. Corrective actions will be implemented when non-conformances or deficiencies are

identified. In addition, field audits will be conducted periodically by the Project Quality Control Officer who is responsible for explosives safety and quality throughout the company.

Procedures for auditing activities will be identified prior to implementation of the audits. The audit process involves identifying, documenting, and reporting non-conformances or deficiencies, initiating corrective actions through appropriate channels, and conducting a compliance review. Auditing tasks and findings will be documented utilizing the QC Audit Checklist and notes. Copies of the audit findings will be uploaded to WESTON TeamLink® project website. Audit inspections of the RespondFast® database, in conjunction with the minimum 10 percent QC checks of each grid performed by the UXOQCS, will be completed to ensure that documentation is being accurately reported. Each field team involved with site work is responsible for reporting any suspected technical non-conformances or deficiencies to the WESTON PM.

The quality requirements associated with (CVFAW) 14 inch bgs MEC Removal Action field activities are defined in Table 3. These requirements apply to all field activities that affect the quality of work and work products. QC checks will be conducted as follows:

Daily Briefings—The UXOSO and SUXOS will ensure that morning tailgate safety and operational briefings are conducted with the project team.

Communications—Positive communications with site personnel will be maintained throughout the workday. At a minimum, communication checks will be conducted each morning prior to starting work. Additional checks will be performed as necessary throughout the workday to monitor progress, safety, and/or QC. Teams will not start operations until satisfactory checks have been achieved.

Training—The UXOQCS will ensure that initial site-specific training is provided to all field personnel prior to startup of field activities and that safety control measures have been established. Training will be accomplished using only approved training materials. The UXOQCS will ensure that all certifications are filed on-site for review.

Geophysical System Verification—A physics-based geophysical system verification (GSV) program approach will be initiated for the CVFAW. The GSV approach capitalizes on the known

performance of geophysical sensors and establishes metrics that monitor the entire mapping effort rather than depending only on sensor evaluations made during initial geophysical prove-out (GPO) procedures.

As part of this GSV approach, the project team will construct an instrument verification strip (IVS) in an anomaly clean area of the site. The IVS will be seeded with target MEC-sized items in order to validate that the geophysical instrumentation is achieving detection performance metrics as established in the approved work plan. IVS data will be collected daily both pre- and post-production in conjunction with standard quality control tests.

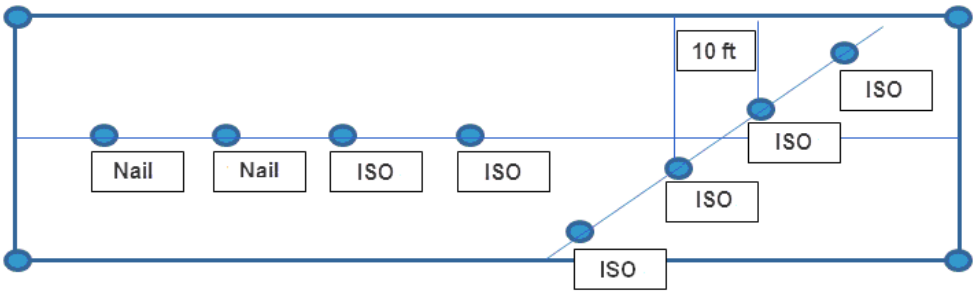
DGM data evaluation and QC will be performed in accordance with the standards and requirements established in the "GSV: A Physics-Based Alternative to GPO for Munitions Response" (ESTCP, July 2009). The GSV program will include the IVS and the Blind Seeding Program. The GSV program provides an alternative method of instrument verification to the more traditional GPO program. One major advantage of the GSV program is that it provides daily verification that the geophysical instruments are operating within their design parameters.

The IVS program will be implemented by installing at least one IVS within each investigation area as indicated in the GSV Plan (GIP). Additional IVS locations may be required based on site-specific geologic conditions or production requirements. Each IVS will consist of a minimum of two industry standard objects (ISOs) per the GSV Plan (GIP). The ISOs for the IVSs will be the small 1-inch by 4-inch pipe nipples. Each ISO will be placed in Least Favorable Orientation which is horizontal with long axis perpendicular to the direction of travel. The small ISOs will be buried at a depth of 12 inches bgs. In areas where an array of multiple geophysical sensors will be deployed an expanded IVS will be established that provides for at least one seed object under each coil or sensor.

The Blind Seeding Program will be implemented by the QC team throughout the DGM production areas. The QC team is independent of the production team and never reveals blind seed locations, types or depths. The blind seeding program provides an ongoing opportunity for monitoring the performance of the DGM teams and builds confidence that all we have achieved sufficient cover and have obtained the desired level of data quality leading to successful RI/FS completion. Blind seeds will be placed at a frequency of one blind seed per acre throughout the

investigation areas. The blind seeds will consist of small ISOs (1-inch by 4-inch pipe nipples) buried within their expected detection range, at approximately seventy five percent of their detection depth and placed at any orientation. The location depth/orientation of each blind seed will be recorded with positions determined using RTK-GPS or tape measures if the tree canopy prevents using RTK-GPS. Using this method if there is a failure to detect a seed item the result will be a meaningful indication that there is a quality failure. In the event of a failure, a root cause analysis will be performed and a solution developed.

IVS Design for Towed-Array.



Geophysical Instrument Function Testing—Magnetometers will be tested at the established IVS with simulants comprised of industry standard objects (metal pipes) buried at different depths and attitudes to simulate ordnance. Each instrument operator will be responsible for demonstrating the magnetometers functionality. The operator will fill out the Instrument Daily Check Out and Return Procedure Form each day to confirm the instrument has been checked. The UXOQCS will monitor the checkout process at the IVS. If the seed items in the test plot are not detectable by the magnetometer, the instrument will be labeled and taken out of service until repaired. Questionable functionality of the magnetometer during removal operations requires additional testing at the IVS by the operator.

Documentation—The UXOQCS will ensure the completion of all Daily Field Activity Records.

Review—The UXOQCS will be responsible for the following activities:

- QC inspections of the areas investigated. A minimum of 10 percent of each grid investigated will be inspected to ensure that the visible MEC, MD, MPPEH, and other metallic items have been removed. A grid is failed if any metal is found on the ground

surface. Once a grid has passed the QC check, the Clark County Munitions Safety Officer will be notified for QA inspection.

- Compliance with the project's Work Plan, Quality Control Plan, and APP/Site Safety and Health Plan.
- Daily communication with WESTON's PM.

4.2.1 Receipt Inspection

Materials and items entering the site will be reviewed for conformance with specification/purchase order requirements as required. Consumables, such as oil and office supplies, will receive a quantity inspection only. Any discrepancies will be rectified with the vendor. An inspection report is not required. Equipment will be inspected upon arriving on-site with the results of the inspections documented on the DQCR, team daily journals, or stand-alone inspection reports, as appropriate. Equipment will be checked to ensure it meets the purchase order requirements and manufacturer's operating requirements.

4.2.2 Material Inspection

Materials brought on-site will be inspected to ensure that they are consistent with purchase order/specification requirements, and this inspection will be documented. In the case of materials of an engineered nature, the UXOQCS will consult with the MEC Response and Removal Task Manager to prepare an inspection plan and consult with a qualified inspector.

4.2.3 Equipment Inspection

Project personnel will inspect equipment effecting quality (such as magnetometers) on a daily basis for obvious defects or damage. In addition, the UXOQCS will perform random inspections of equipment to ensure that that equipment is in proper working order and working consistent with established requirements. These inspections are in addition to the geophysical instrument function testing, and will be documented on the DQCR.

4.2.4 Explosives Inspection

All explosives inspections will be conducted in accordance with the Explosives Management Plan (Section 5). Detailed procedures for explosives inspections are included in Section 3.

4.2.5 Surveillance

Surveillance will be carried out at the discretion of the PM, SUXOS, or UXOQCS as required. Surveillance may be informal or formal and may be scheduled or unscheduled. At a minimum, the results of the surveillance, including any actions required, will be documented either in a separate report or in periodic reports such as the DQCR.

4.3 INVESTIGATION FAILURE CRITERIA

An investigation failure results when a performance metric is exceeded or cannot be achieved. Grid failures occur if any MEC or MD item (to include inert blind seeded items (Appendix E, Table 1 for blind seed specifications) or more than five non-MEC/MD metal items that are greater than two inches square are found in a grid. Upon completion of a grid by the UXO Team, the UXOQCS will perform a QC grid inspection encompassing, at a minimum, 10 percent of the grid surface area. The list of grids completed, checked by QC, and ready for QA inspection will be updated daily, as required, and forwarded or made available to Clark County. The QC process is shown on Figure 5. Grid failures will be documented on the DQCR. Any deficiencies that are identified will require a corrective measure, and a root-cause analysis will be performed to document the issue, analysis, and corrective action. Such root-cause analyses will be submitted to Clark County as memorandums. A corrective action will include reinvestigation of the grid and may also include resurvey of the grid or adjusting analog instrument settings. The exact corrective action will be determined by following the corrective action process detailed in the sections below.

4.4 CORRECTIVE ACTION PROCESS

It is the responsibility of the PM to ensure procedures for reporting, evaluating, and correcting non-conformance are addressed through planned QC procedures. Non-conforming conditions may be discovered as a result of inspecting items or materials or by observing operations.

Project personnel are responsible for identifying non-conforming conditions and notifying their supervisor or manager as soon as the conditions are identified. Determination of any non-conforming conditions must be supported with objective evidence. Non-conforming conditions will be evaluated and corrected and may be considered as opportunities to improve the process.

4.4.1 Identifying and Reporting Non-Conforming Conditions

Non-conforming conditions must be identified and documented. Individuals having knowledge of a nonconforming condition must document the condition in a Non-Conformance Report (NCR) and request assistance from the UXOQCS.

4.4.2 Controlling Non-Conforming Conditions

Upon receipt or preparation of an NCR, the UXOQCS or designee must perform the following activities:

- Log in the NCR and assign it a number
- Notify client representative
- Review the report to determine the nature of the nonconformance
- Initiate a Corrective Action Report (CAR)
- Transmit the report to the appropriate project management staff for review and evaluation

The UXOQCS will maintain an NCR log for the project. The NCR log will be used to track and control each nonconforming condition and its corrective action. At a minimum, the NCR log must contain the date each nonconforming condition was discovered (NCR, date), the CAR number, and a description of the nonconforming condition, the department/manager responsible for disposition, the recommended disposition, and the CAR closure date.

The UXOQCS or designee, after logging the NCR, will review the NCR to determine its validity. If the NCR is determined to be valid, the UXOQCS will transmit the NCR to the responsible party for resolution and documentation in a CAR (Appendix F).

4.4.3 Root Cause Analysis

If a product or a process displays a characteristic out of specification with those required by the project specifications or QC objectives, action will be taken to determine the cause. The depth and extent of root cause analysis depends on the situation; it may be as simple as an overlooked step, or it may be a complicated process. Root cause analysis is the responsibility of the PM and may be delegated to other qualified technical and/or QC personnel. The following factors should be considered in the analysis:

- Personnel factors
- Equipment factors
- Methodology factors
- Measurement factors
- Environmental factors
- Material factors

Input may be obtained as necessary from field personnel and technical advisors in order to identify the factors that led to the condition. Any analysis conducted must be documented on the CAR.

4.4.4 Review, Evaluation, and Disposition of Non-Conforming Conditions

Upon receipt of an NCR, the UXOQCS will notify SUXOS and PM of the non-conformance and will review the non-conforming condition and document the recommended disposition on the form.

Once the responsible party has completed its evaluation of the non-conforming condition, documented its recommended disposition, and signed and dated the NCR, the NCR will be returned to the UXOQCS for further processing. Upon receipt, the UXOQCS or designee will update the NCR log, evaluate the recommended disposition, and determine whether corrective action is required.

If corrective action is warranted, the UXOQCS will initiate a CAR. The UXOQCS will also indicate on the CAR the affected disciplines or organizations who must review the recommended disposition. The UXOQCS or designee will route the CAR for review, concurrence, or rejection.

Appropriate qualified technical professionals must review and evaluate the nonconformance, decide on the suitability of the recommended disposition, identify appropriate action, and enter the details of the evaluation on the CAR. At a minimum, the PM, MEC Response and Removal Task Manager, SUXOS, and UXOQCS will review and evaluate the nonconformance. The PM or UXOQCS may also designate UXO Team Leaders and other field personnel to participate in this process. Each condition adverse to quality and/or each nonconforming characteristic will be compared against acceptance criteria during the evaluation of the recommended disposition. The CAR will then be returned to the UXOQCS or designee.

Upon receipt of the reviewed and evaluated CAR, the UXOQCS or designee will log in the results of the review, indicate acceptance or rejection by signing the CAR, and distribute completed copies to the individuals who reviewed the CAR and to the responsible organization. CARs will be maintained in the project files and available on-site.

4.5 CORRECTIVE ACTIONS AND PREVENTIVE ACTIONS

Corrective action refers to the specific action or actions taken to correct an immediate situation and to reduce or prevent the likelihood of future occurrences. Examples of corrective action for an immediate situation include rerunning a portion of a test/operation that was not conducted in accordance with procedures, calibrating test equipment found to be out of calibration, and rerunning any required tests. Procedures for the corrective action process are described in Section 4.4.

Preventive action refers to the specific action or actions taken to prevent or reduce the likelihood of future occurrences of non-conformance. Examples of preventive actions are clarifying or refining procedures, allowing for additional training, and/or enhancing monitoring.

Preventive action measures will be selected to prevent or reduce the likelihood of future non-conformance occurrences and will address root causes to the extent identifiable. Selected measures will be appropriate in relation to the seriousness of the nonconformance and will be

realistic in terms of the resources required to implement them. Preventive actions will also be summarized on the CAR and will be communicated to the project team.

4.6 LESSONS LEARNED PROCESS

This process is designed to identify nonconforming conditions. As required by this program, actions are taken to correct non-conformances and to prevent their recurrence. These conditions will be assessed to determine whether they are systematic or unique occurrences. After informal review and discussion by the project team, those conditions that might aid other projects will be documented as lessons learned, describing the original condition and results, changes made, and the resultant improvements. If no changes were made, but in hindsight should have been, this information will be detailed. Lessons learned will be discussed in the final After Action Report.

All personnel are encouraged to continuously review processes and to suggest changes that improve the process, provide benefits, or improve project efficiency, safety, and quality. These suggestions can be either formally submitted (written memo to project leadership) or informally through verbal discussions at project meetings.

4.7 QUALITY CONTROL OF CONTRACT SUBMITTALS

Field data and documents will be reviewed/verified for technical completeness and accuracy by the appropriate WESTON technical/project management team member prior to transmitting deliverables to Clark County. Notes recorded from formal and informal meetings through the duration of the project will be cross-checked to ensure applicable comments were addressed.

4.8 EMPLOYEE PROCESS TRAINING PROGRAM

All personnel will have the experience and training necessary for their assigned tasks. Workers performing direct work in the CVFAW shall have a minimum of 40 hours of off-site instruction (Occupational Safety and Health Administration 40-hour Hazardous Waste Operations and Emergency Response Certification), and three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel will meet the training requirements identified in the APP (Appendix D). Prior to beginning fieldwork or new phases of work, the

UXOQCS will review work processes with project personnel to ensure they are adequately trained/refreshed in phase work requirements, standards, and procedures.

All visitors to the WESTON work site will be required to sign in with the UXOSO and to participate in the health and safety briefing. All visitors must be escorted by project personnel while on-site. New project personnel and subcontractors must review the APP and receive site-specific training.

5. EXPLOSIVES MANAGEMENT PLAN

5.1 GENERAL

This Explosives Management Plan provides the procedures to be used by UXO personnel to acquire, receive, store, transport, and issue explosives, and report the loss of explosives utilized during the 14 inch bgs MEC Removal Action in the CVFAW. All personnel involved with explosives will comply with federal, state, and local laws as required.

5.2 LICENSES/PERMITS

WESTON has a Type 33-User of High Explosives Permit from the Department of the Treasury – ATF and will secure a Washington permit to purchase, use and store explosives as required by local regulations. A copy of all licenses and permits will be maintained on-site and available to any local, state, or federal authority. Site personnel who will handle or have access to explosives will have processed ATF Employee Possessor Forms on record.

5.3 ACQUISITION

Acquisitions will be made by the SUXOS on an as-needed-basis in a timely manner. The initial acquisition must be in place prior to beginning intrusive activities, and all subsequent shipments must be on site to ensure there is no break in operations. Before demolition materials are ordered, the Purchase/Receipt Authorization List (Appendix F) must be completed and forwarded to the explosives distributor(s), along with a copy of WESTON's ATF License. Prior to bringing the explosives on-site to the CBMR property, the SUXOS will coordinate with the Clark County PM and Munitions Safety Advisor. WESTON will determine the quantity of donor explosives on an as-needed basis. Explosives will be stored on site in two portable explosives storage magazines. Donor explosives may include perforators, boosters, detonation cord, and blasting caps.

5.4 ACQUISITION SOURCE

Donor explosives will be purchased from Timber Supply Explosives Inc., P.O. Box 151, Philomath, OR 97370. POC with the company is Dennis Bennett (telephone number: [541] 929-3151).

5.5 INITIAL RECEIPT OF EXPLOSIVES

Only those individuals named on the authorization list may sign for explosives from the shipper. To ensure that the quantity shipped is the same as the quantity listed on the shipping documents, the SUXOS will inventory the shipment before signing for it. If the SUXOS is unavailable, a designee from the Purchase/Receipt Authorization List will inventory the shipment before signing for the shipment.

Upon receipt of each shipment, the type, quantity, and lot number of each item will be checked against the manifest and entered on the Magazine Data Card (Appendix F). In the event there is a discrepancy between the amount of explosives shipped and the amount of explosives received, the SUXOS will immediately contact the explosives supplier and inform the supplier of the discrepancy. If there is a discrepancy, the shipment will not be accepted. It is then the responsibility of the supplier to rectify the situation and inform WESTON of the results. If the discrepancy cannot be resolved within 24 hours, the Clark County PM, Local Law Enforcement Agency, and ATF will be notified. Figure 6 depicts the receipt of explosive materials process.

5.6 EXPLOSIVES STORAGE MAGAZINE

Donor explosives will be stored in two Bureau of Alcohol, Tobacco, and Firearms Type 2 magazines with attached detonator boxes. The magazines will be sited as depicted on Appendix A, Figure 5 as described in Section 7.2. No more than 100 pounds net explosive weight will be stored in a single magazine. The Inhabited Building Distance for this net explosive weight is 658 feet in accordance with the DOD 6055.09-M Table V3.E3.T2 and the Public Transportation Route distance is 395 feet in accordance with DOD 6055.09-M Table V3.E3.T2. These distances are more safety conservative than those prescribed by the Bureau of Alcohol, Tobacco, and Firearms. Magazines will be separated by a minimum of the Intermagazine Distance K11 of 51 feet. In accordance with DOD 6055.09-M V3.E3.T8. These commercial explosives will have assigned DOD hazard division/storage compatibility groups and will be stored in accordance with DOD 6055.09-M, DA Pam 385-64 and any local installation regulations.

5.7 TRANSPORTATION

The transportation of explosives to on-site locations requiring demolition operations will be conducted in the following manner:

- Vehicles transporting explosives to locations requiring demolition operations will stay on roads either improved or unimproved.
- Drivers will comply with posted speed limits, but will not exceed a safe and reasonable speed for conditions.
- Vehicle engine will not be running and brakes will be set when loading/unloading explosives.
- Vehicles will have a safety inspection performed and DD form 626 completed prior to loading explosives.
- Vehicles will be equipped with a first aid kit and a minimum of two each 2A10BC fire extinguishers.
- Initiating explosives, such as detonators, will remain separated from other high explosives during loading, unloading, and while on vehicles.

5.8 RECEIPT PROCEDURES

Prior to accepting any explosives, the procedures outlined above in the initial receipt procedures section will be followed. The WESTON SUXOS is authorized to purchase, receive, access, issue, transport, and use explosives for this project. Any other project personnel who will have access, issue, transportation, and use authority for explosives on this project will be annotated on the approved user list, which will be maintained in the explosive management records.

Upon completion of each demolition operation, an ammunition consumption report will be completed. Upon expenditure of all explosives, the authorized person will certify in writing that the explosives were used for their intended purpose.

5.9 INVENTORY

Upon receipt and verification of explosives demolition material, the Magazine Data Card will be filled out and kept in the magazine on top of the listed item. A duplicate copy will be maintained by the UXOQCS. If explosives are to be stored for a period of time, a weekly inspection by the SUXOS and QC will be conducted.

5.10 REPORTING LOST OR STOLEN EXPLOSIVES

If, during an inspection of the explosives magazine, it is determined that forced entry has occurred, personnel will follow these rules:

- Do not open the magazine.
- Do not handle or disturb items within the immediate vicinity.
- Secure the magazine by posting a guard to prevent further access.
- Immediately notify the following individuals (Table 4):
  - Clark County Project Manager
  - Clark County Munitions Safety Advisor
  - WESTON SUXOS
  - WESTON UXOSO
  - WESTON UXOQCS
  - WESTON PM
  - WESTON UXO Service Line Leader
  - WESTON MEC Response and Removal Task Manager
  - Local authorities, as directed
  - ATF
- Do not allow entry near the magazine by others until law enforcement personnel arrive.
- Immediately upon request of Law Enforcement Personnel, perform physical inventory and reconcile on-hand explosives with Magazine Data Cards (Appendix F).
- Assist above individuals and agencies as needed.

Loss or theft of explosives will be reported as stated in 27 Code of Federal Regulations on Commerce in Explosives. Table 4 lists the individuals or organization to be notified upon the discovery of theft or loss of explosives.

5.11 DISPOSAL OF REMAINING EXPLOSIVES

WESTON is required by ATF to account for all explosives purchased and used. Following completion of work in the CVFAW, all unused explosives will be retained for usage in subsequent work at the CBMR. Explosives remaining upon completion of all work at CBMR will be returned to the supplier or destroyed on site and properly documented.

6. ENVIRONMENTAL PROTECTION PLAN

This Environmental Protection Plan (EPP) has been prepared in accordance with DID MR-005-12 (Environmental Protection Plan) (USACE, 2003). The objective of this EPP is to provide adequate procedures and methods during site activities to safeguard against detrimental impacts to the surrounding environment and its natural resources, to correct any damage done to the environment as a result of site activities, and to control noise and dust on-site within reasonable limits. This EPP addresses the known environmental concerns/issues associated with this project; however, during operations, unforeseen concerns/issues may arise. In this event, operations in the affected area will be suspended until the full potential environmental impact is understood and appropriate measures are taken to minimize the environmental impact.

6.1 THREATENED/ENDANGERED SPECIES

There are no federally registered endangered species either present or potentially present at CBMR. However, there are several special-status species present at or near CBMR. Species confirmed at or near CBMR include:

- **Amphibians:** Northern red-legged frog (federal species of concern)
- **Birds:** Vaux's swift (state candidate species) and Pileated woodpecker (state candidate species)
- **Mammals:** Brush Prairie (Northern) pocket gopher (state candidate species)
- **Fish:** Coastal Cutthroat Trout: federal species of concern
- **Vegetation:** Hairy-stemmed checker mallow (state endangered species) and Small-flowered trillium (state sensitive species)

WESTON will prepare a short training that outlines special-status species potentially onsite. The training will include photographs that show the sensitive species as well as the specific habitat that the sensitive species is found. The training will be administered by the UXOSO to all WESTON employees and subcontractors that participate perform tasks at the CVFAW one time upon arrival to the site. In the event that special-status species is noted, the SUXOS will be notified. The SUXOS will verify the presence of the special-status species. After verification, the

SUXOS will immediately notify Clark County and the WESTON MEC Response and Removal Task Manager.

6.2 WATER RESOURCES

The principal surface water feature in the vicinity of the investigation area is Lacamas Creek, which flows southward from the confluence of two branch streams in the north-central part of CBMR, exiting the installation at its southwest corner. From the southwestern property boundary, Lacamas Creek flows southwestward to Proebstel, where it turns toward the southeast and continues to its confluence with the Columbia River at the town of Camas. Numerous minor tributaries, that drain adjacent uplands, flow into Lacamas Creek. Buck Creek and David Creek, the largest of these streams, drain the southeastern hills of CBMR.

The Lacamas Creek flows directly through the CVFAW. Operations will not result in erosion of sediment or distribution of debris into Lacamas Creek located within the CVFAW. Demolition activities will not impact the Lacamas Creek or its tributaries.

6.3 CULTURAL, ARCHAEOLOGICAL, AND HISTORICAL RESOURCES

A Professional Archaeologist will conduct archaeological awareness training for the entire Remediation Team prior to the commencement of the removal action in the CVFAW. Upon inadvertent discovery of any archaeological object, archaeological site, or human remains, work will stop in the vicinity of the discovery and field crews will adhere to the provisions in Appendix J, Archaeological Treatment Plan.

6.4 COASTAL ZONES

There are no coastal zones on or near the CVFAW.

6.5 VEGETATION REMOVAL

Where necessary, WESTON will remove all vegetation that would interfere with reacquisition and intrusive investigation activities prior to conducting the DGM survey. Vegetation will be removed to a level of approximately six inches above ground surface. WESTON will use prior

experience to minimize the amount of vegetation that is removed. UXO personnel will oversee all vegetation removal. Vegetation will not be removed by burning.

Vegetation will be removed from wetlands areas and throughout the CVFAW. Appropriate permits will be obtained for vegetation removal as provided in Appendix K. WESTON will prioritize the removal of vegetation in the wetlands to ensure that the vegetation task can be completed during the dry season. The work schedule will take into account annual rainfall, which averages between 39 inches and 49 inches annually. The work schedule will minimize impacts to the wetlands by completing the work in a short period before the soils are saturated or inundated. Vegetation removal will begin in July or August to mitigate potential damage to occupied bird nests. Wetlands and riparian areas are some of the best habitats for bird nesting, so the likelihood of finding a nest, particularly in shrubs and trees, during the nesting season is high. By July August, most young have fledged and left the nest, and no nesting occurs in the winter. Destruction of occupied bird nests is a violation of the Migratory Bird Treaty Act.

6.6 SAMPLING

No sampling for munitions constituents or other traditional environmental contaminants is included in the 14 inch bgs MEC removal action in the CVFAW.

6.7 INVESTIGATION DERIVED WASTE DISPOSAL

Investigation-derived waste generated during the project will be limited to materials generated during investigation that do not require special handling, packaging or disposal.

6.8 DECONTAMINATION PROCEDURES

All operations for the MEC portions of this project will be conducted in modified Level D personal protective equipment (PPE). No decontamination of personnel is anticipated. All PPE are considered non-hazardous and will not require special handling or disposal procedures. Equipment and vehicles used for other aspects of the 14 inch bgs MEC removal of the CVFAW described in this work plan are not expected to require decontamination.

6.9 MITIGATION PROCEDURES

6.9.1 Manifesting, Transportation, and Disposal of Wastes

No investigation-derived waste is expected to be generated during the CVFAW 14 inch bgs Removal Action. All PPE and disposable sampling equipment are considered non-hazardous. PPE and sampling equipment will be placed in a plastic bag and disposed in an appropriate refuse container.

Non-disposable sampling equipment will be decontaminated following each use. A stiff, nylon-bristle brush will be used to remove any dirt adhering to the tools. If additional decontamination is required (e.g., dirt was unable to be removed with the brush), a biodegradable soap solution will be used and then the tool will be rinsed in tap water. Decontamination water will be placed on the ground within the same area from which it was generated.

If, however, investigation-derived waste is generated, it will be properly containerized and characterized prior to disposal. For non-explosive soil, containerization will consist of plastic or steel drums or pails with secure covers. For liquids (i.e., water) containerization will consist of a plastic drum or pail with secure cover. Characterization of the wastes will be as required by the receptor site.

6.9.2 Burning Activities

Open fires, such as campfires or fires to dispose of cut brush, will not be permitted during the performance of this project.

Smoking will be restricted to designated areas. Smoking areas will be designated by the UXOSO. In all cases, cigarettes butts and matches must be disposed of in a sealable metal butt can. Cigarette butts and matches may not be discarded onto the ground surface.

6.9.3 Dust and Emission Control

WESTON will limit vehicle travel to a slow rate of speed in order to minimize the potential for dust emissions. During all grading, transportation, and sifting operations, dust levels will be

monitored, and abatement measures will be implemented, if required. These procedures are detailed in the Site Safety and Health Plan.

6.9.4 Noise Control and Prevention

It is expected that this project will generate two primary sources of noise: noise from mechanical equipment (e.g., trucks), and noise from demolition activities. WESTON will control the noise emissions from mechanical equipment by ensuring that the manufacturer's noise control equipment is in place and functioning (e.g., mufflers). To minimize nuisance noise, equipment will be powered off when it is not in use.

The second source of noise will be pulse noises resulting from demolition activities. Both tamping the demolition shot with earth or sand bags and observing weather conditions on the day of the shot will control this noise. For example, a day with a low cloud ceiling will transmit the nuisance noise more effectively than a clear day. To reduce the nuisance noise on a cloudy day, various options, including possibilities such as not conducting the demolition shot, waiting for a shift in prevailing winds, reducing the net explosive weight of the shot, or some combination of controls, will be assessed. The SUXOS and the Demolition Supervisor will determine the best method of noise control.

As noise generated by project activities will be limited to infrequent pulses that are short in duration, WESTON does not anticipate adverse impacts to resident fauna. It is expected that fauna will temporarily avoid areas where noise is being generated until the activities have ceased.

6.9.5 Spill Control and Prevention

WESTON plans to conduct most fueling and repair of vehicles off-site if possible. This practice will decrease the amount of pollutants that need to be stored on the Site. All-terrain vehicles may be refueled on-site.

Those liquids of a hazardous nature that are absolutely necessary to conduct the work will be stored in small quantities. If it is necessary to store hazardous waste or materials with hazardous constituents in a storage tank (i.e., a stationary device, designed to contain an accumulation of

hazardous waste, which is constructed of primarily of non-earthen materials), it will be placed within an approved secondary containment of adequate size to contain a spill (110 percent of storage tank size). In the unlikely event that WESTON will need to store containers of hazardous waste on-site, they will be used and managed in accordance with 40 Code of Federal Regulations Subpart I. Any spills originating from small containers (e.g., gasoline cans) will be contained by the use of absorbent materials.

Section 304 of the Emergency Planning and Community Right to Know Act requires notification of releases of Extremely Hazardous Substances and Comprehensive Environmental Response, Compensation, and Liability Act hazardous substances in amounts that equal or exceed the substance's reportable quantity (RQ). An RQ is the amount of a hazardous substance that requires notification if released into the environment (air, water, or land) from a fixed facility.

WESTON anticipates that unleaded gasoline, diesel fuel (#2), and motor-oil will be the only substances with hazardous constituents that may be stored on-site in quantities greater than five gallons. According to the Material Safety Data Sheet for unleaded gasoline, diesel fuel, and motor-oil, the RQ for unleaded gasoline is one pound. There is no RQ for diesel fuel or motor-oil. If a discharge occurs that exceeds the RQ of the main hazardous constituent, WESTON will advise Clark County so that they may evaluate regulatory reporting requirements.

Because of the nature of the operations, the potential for a spill of pollutants during operations is low. The highest probability for a spill will occur during re-fueling operations of equipment. Small engine refueling will be conducted over a catchment pan. Additionally, WESTON will be equipped with spill kits on-site for immediate cleanup if a petroleum product is inadvertently spilled. Any spills originating from small containers (e.g., gasoline cans) would be contained using absorbent materials. In the event of a spill, WESTON will notify the appropriate emergency responders. If fuel or oil is spilled, the following measures will be taken:

- The spill area will be isolated and contained.
- The WESTON PM will be notified during a spill response.
- The liquid and affected soil will be shoveled into a plastic bag and subsequently placed into a Department of Transportation-approved shipping container.

- Each container will be labeled to identify its contents.
- The container(s) will be shipped off-site and disposed of at a permitted facility in accordance with the Code of Federal Regulations 260 – 270.

6.9.6 Storage Areas and Temporary Facilities

Storage of materials will be in a designated on-site area approved by Clark County. Scrap metal will be containerized and stored in locked 55-gallon drums or other lockable metal containers. Containerized scrap metal will be disposed of off-site at the conclusion of the project. WESTON does not anticipate the construction or use of a temporary storage area for hazardous materials. Temporary storage of fuel containers will be contained within an established fuel storage area. Unless directed by the POC to do otherwise, all temporary facilities erected by WESTON will be removed during demobilization.

6.9.7 Access Routes

WESTON will use established roadways (dirt or paved). Although the majority of operations will be conducted using trucks, all-terrain vehicles will be used for data collection throughout the CVFAW. WESTON does not anticipate preparing any temporary roads in the CVFAW, but will maintain the existing roads as required.

6.9.8 Vegetation Protection and Restoration

WESTON will take all actions necessary to protect and prevent unnecessary damage to vegetation. WESTON personnel will remove only the vegetation necessary for safe and effective access for investigation activities, to ensure that the impacts on all rare and protected floral and faunal species will be avoided and minimized to the greatest extent practicable. No vegetative restoration is planned after Removal Activities are completed.

6.9.9 Site Water Run-On and Run-off

Run-on and run-off water controls are not necessary because there is no expectation that contaminated soils, water, or waste are present on-site or that such materials will be generated while conducting activities on-site. All project activities will be conducted in a manner that

prevents the discharge of pollutants into adjacent waterways. Waste disposal will be at an off-site facility.

6.9.10 Minimizing Areas of Disturbance

To the greatest extent practicable, all activities associated with this project will be conducted in a manner that will avoid and minimize impacts to land resources both within and outside of the project boundaries. The area of soil that will be disturbed on this project is not anticipated to be above the threshold requiring erosion and sediment control plans and provisions.

6.9.11 Site Protection Restoration

Disturbed areas will be visually inspected immediately after completing site restoration.

6.9.12 Dust Monitoring

Dust monitoring may be necessary for the activities planned during this Removal Action. The UXOSO will visually monitor for dust during brush cutting and soil sifting activities. If visible dust is observed, the Monitoring of Dust Generating Activities SOP (Appendix G) will be followed.

7. PROPERTY MANAGEMENT PLAN

No federal, state, or local government equipment or material will used during this effort; therefore a Property Management Plan is not required or applicable for the MEC removal in the CVFAW.

8. INTERIM HOLDING FACILITY SITING PLAN FOR RECOVERED CHEMICAL WARFARE MATERIEL PROJECTS

There is no known or suspected presence or use of Chemical Warfare Materiel at the CBMR thus an interim holding Facility Siting Plan for Chemical Warfare Materiel Projects is not required or applicable for the MEC removal in the CVFAW.

9. PHYSICAL SECURITY PLAN FOR RECOVERED CHEMICAL WARFARE MATERIEL PROJECT SITES

There is no known or suspected presence or use of Chemical Warfare Materiel at the CBMR thus a Physical Security Plan for Chemical Warfare Materiel Projects is not required or applicable for the MEC removal in the CVFAW.

10. REFERENCES

Bonneville Conservation Restoration and Renewal Team, LLC (BCRRT). 2007. Final Remedial Investigation/Feasibility Study, Small Arms Ranges RAU-2A. Vancouver, WA.

BCRRT. 2008. Final Cleanup Action Plan, Small Arms Ranges (RAU 2A). Vancouver, WA. January.

BCRRT. 2010. Final Remedial Action Unit 3 (RAU 3) Cleanup Action Plan. Vancouver, WA. April.

Camp Bonneville Local Redevelopment Authority, 2005. Camp Bonneville Reuse Plan. November 15.

Clark County. 2003. Camp Bonneville Reuse Plan, Preliminary Site Plan. Prepared by Clark County, Washington, January 2003.

Department of Defense Explosives Safety Board, 2004. Technical Paper (TP) 18, Minimum Qualifications for Unexploded Ordnance Technicians and Personnel.

Environmental Science and Engineering, Inc. 1983. Installation Assessment of the HQ, I Corps and Ft. Lewis, Washington and the Sub installation Yakima Firing Center, Camp Bonneville, and Vancouver Barracks.

Geo Recon International. 1981. Cultural Resources Survey, Forest Management Project, Ft. Lewis and Camp Bonneville, Washington, for U.S. Army, Ft. Lewis.

Hart Crowser. 1996. Petroleum Contaminated Soil Investigation, Former Tank no.7-CMBPN, Building no. 4475, Camp Bonneville Washington. Contract No. DACA67-93-D-1004. September 1996.

Larson, Lynn L. 1980. Cultural Resource Reconnaissance of Forest Management Tracts on Fort Lewis and Camp Bonneville. Office of Public Archaeology, Institute for Environmental Studies, University of Washington, Reconnaissance Report No. 34.

Mundorff, MR. 1964. Geology and groundwater conditions of Clark County, Washington, with a description of major alluvial aquifer supply along the Columbia River: U.S. Geological Survey Water Supply Paper 1600, 268 p.

Phillips, WIMP. 1987. Geologic Map of the Vancouver Quadrangle, Washington and Oregon.

Sadler, Dale L. 2003. Cultural Resources Survey of Selected Areas, Camp Bonneville, Clark County, Washington. Fort Lewis, Washington.

Shannon & Wilson. 1999a. Final Report Volume 1 Multi-Sites Investigations, Camp Bonneville, Washington. Contract No. DACA 67-94-D-1014. July 1999.

Shannon & Wilson 1999b. Final Landfill 4 Investigation Report, Camp Bonneville, Washington. Contract DACA 67-94-D-1014. August 1999.

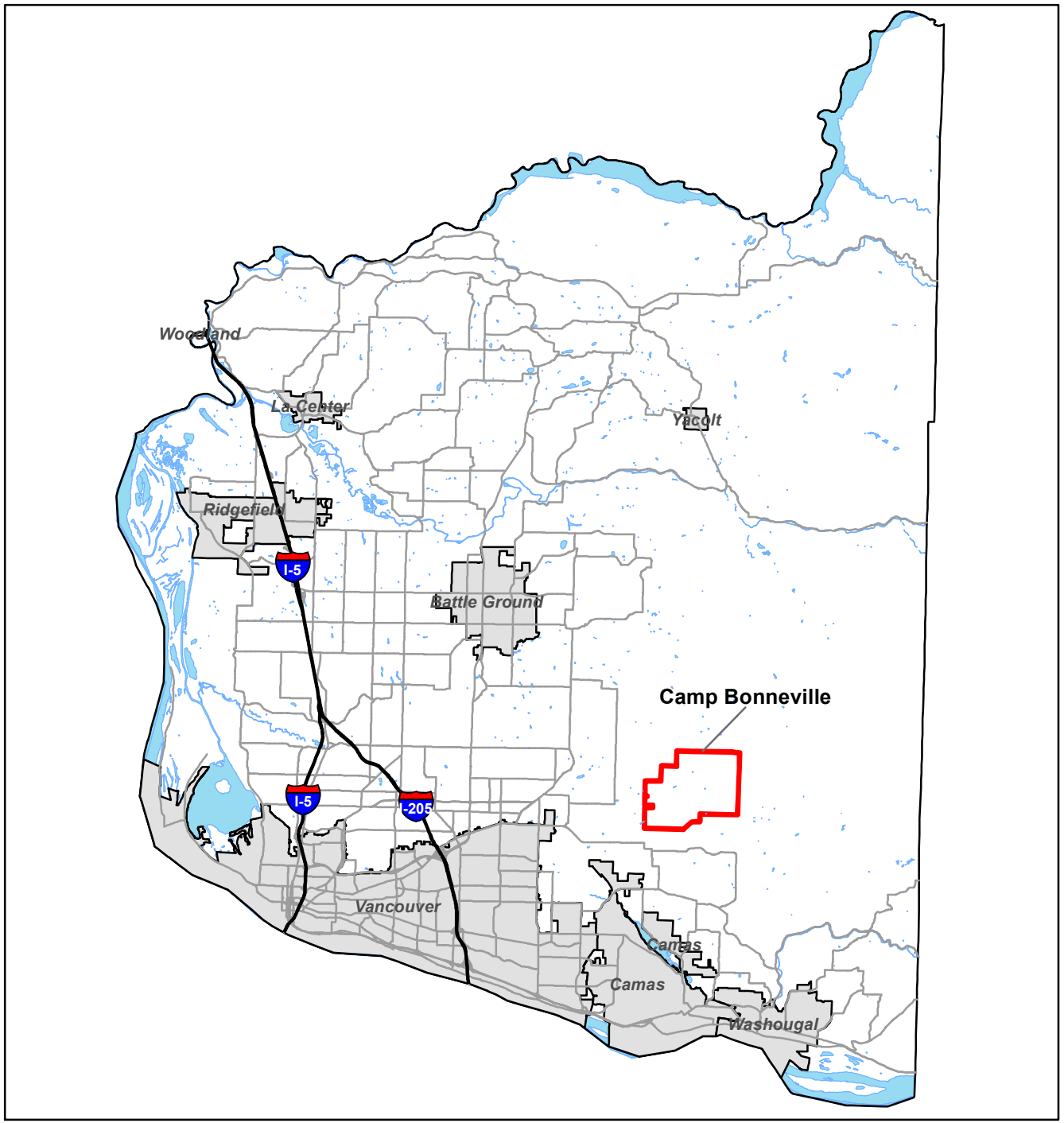
U.S. Army Corps of Engineers (USACE). 2003. DID MR-005-12, Environmental Protection Plan.

USACE. 2007. Engineering Manual (EM) 1110-1-4009, Engineering and Design – Ordnance and Explosives Response, June 2007.

USACE. 2009a. DID MMRP-09-001, Work Plans.

USACE. 2009b. DID MMRP-09-016, Periodic Status Report.

FIGURES



N

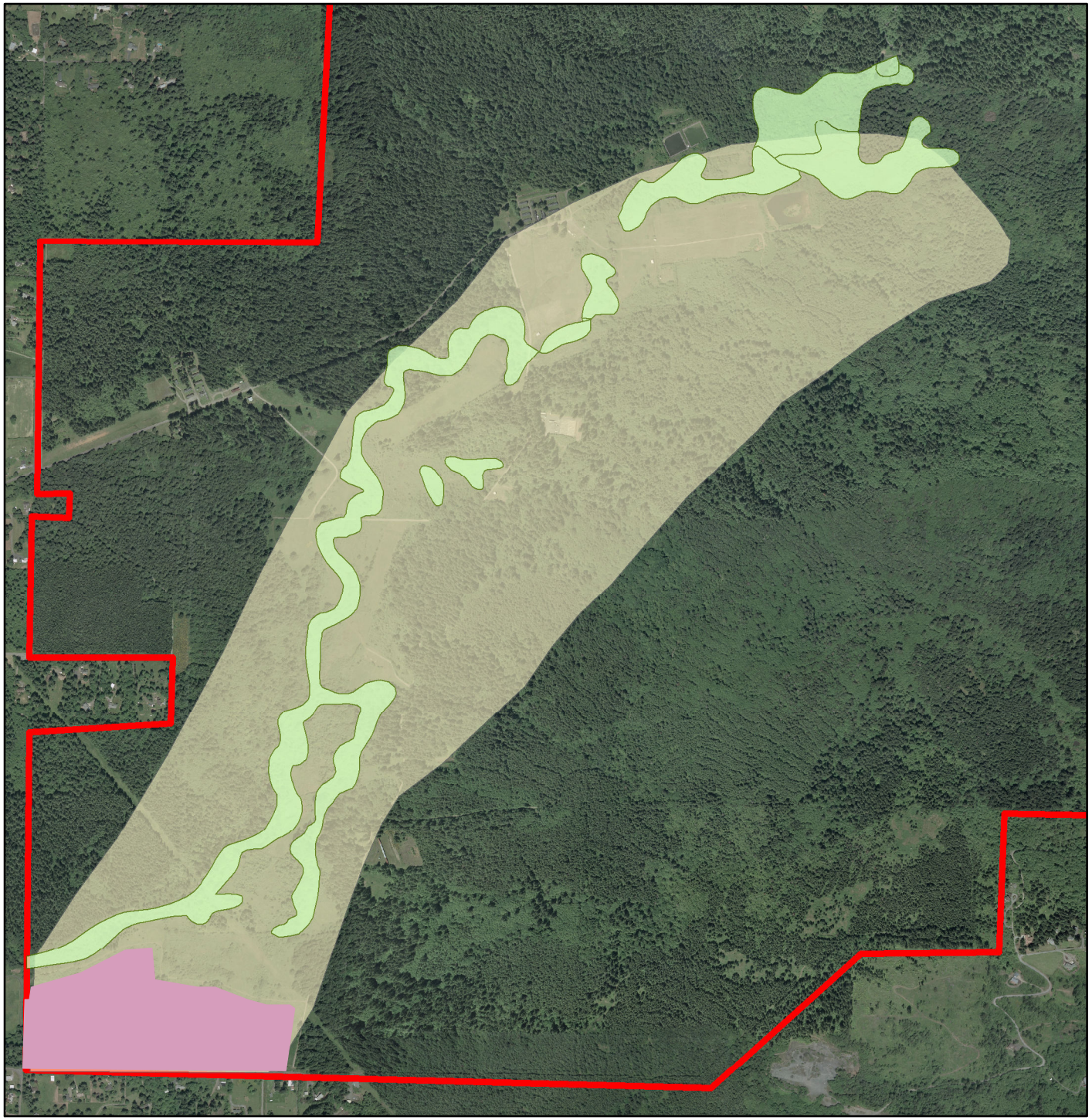
0 2.5 5 10 Miles

Clark County Public Works

FIGURE 1
FORMER CAMP BONNEVILLE
MILITARY RESERVATION LOCATION

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



LEGEND

- Environmental Study Area
- Wetland Area
- Central Valley Floor
- Camp Boundary

N

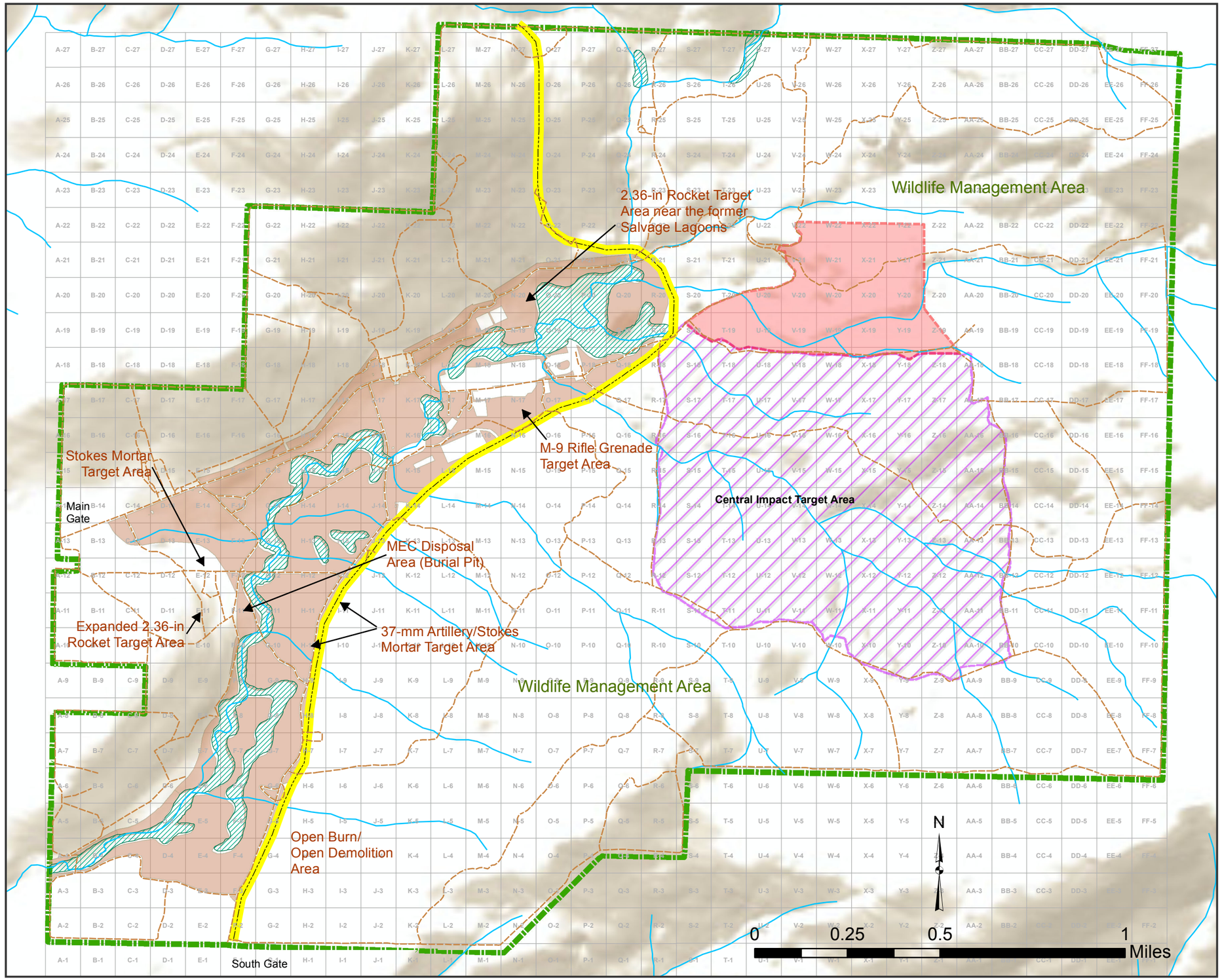
0 500 1,000 2,000
Feet

Clark County Public Works

FIGURE 2
REMEDIAL ACTION UNIT 3
AND THE CENTRAL VALLEY FLOOR
AND ASSOCIATED WETLANDS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



LEGEND

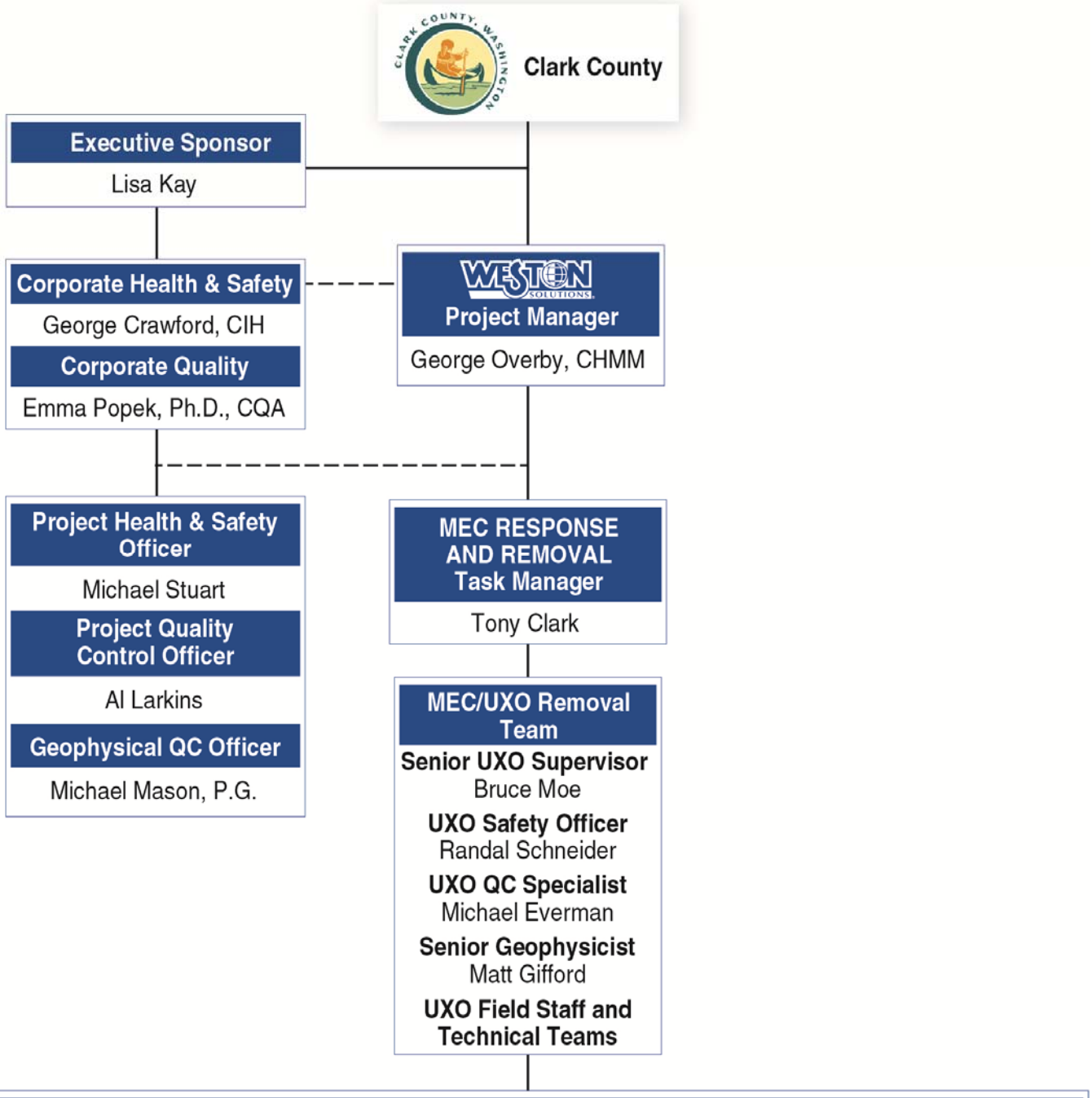
- Property Boundary
- Central Valley Perimeter Survey
- Central Impact Target Area
- Central Impact Target Area Expansion
- Wetlands
- Park Boundary
- Streams / Rivers
- Roads

Clark County Public Works

FIGURE 3
CVFAW, TARGET AREAS, AND DISPOSAL AREAS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



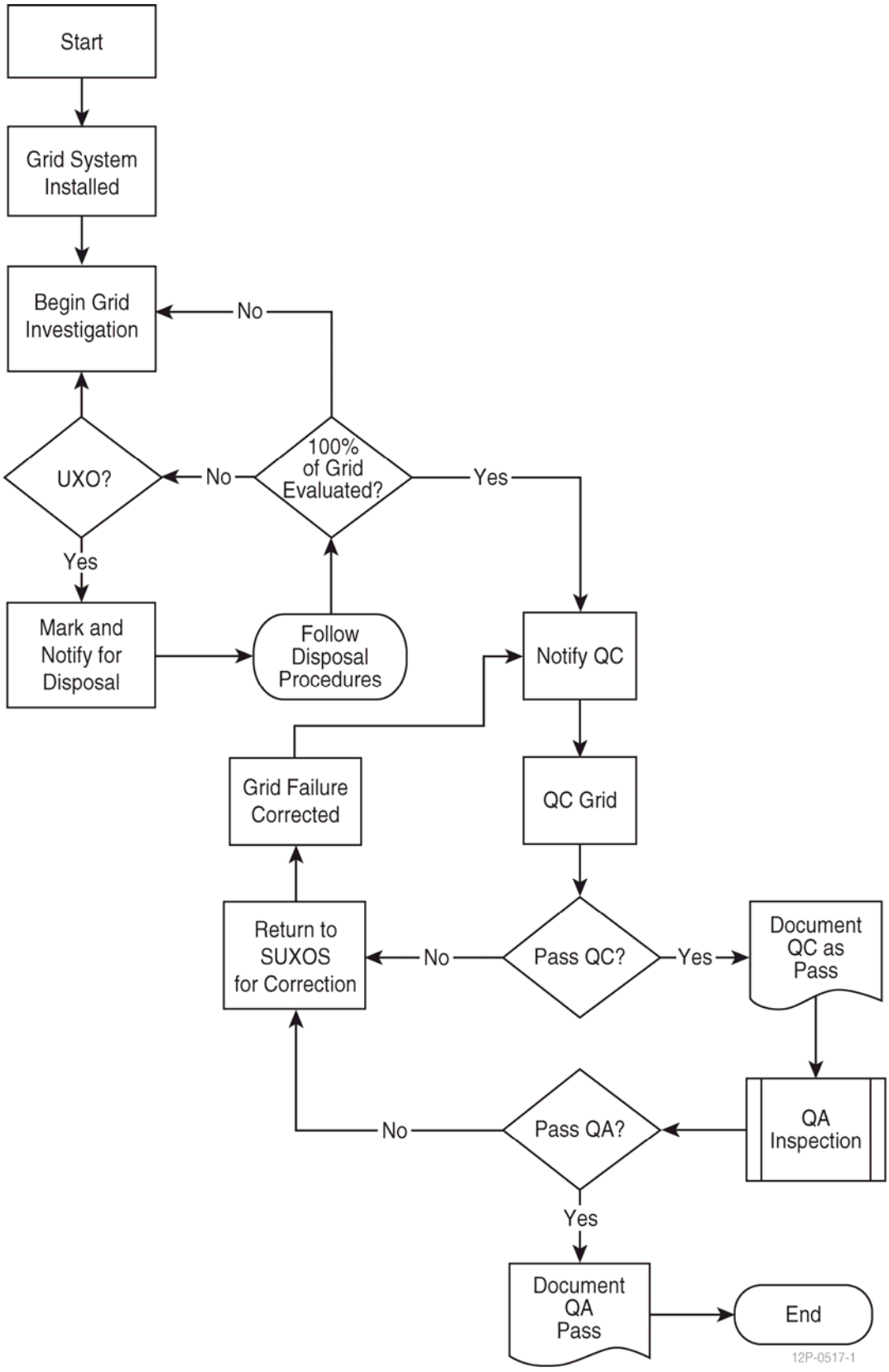
11P-1171-1B

Clark County Public Works

FIGURE 4
PROJECT ORGANIZATION CHART

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

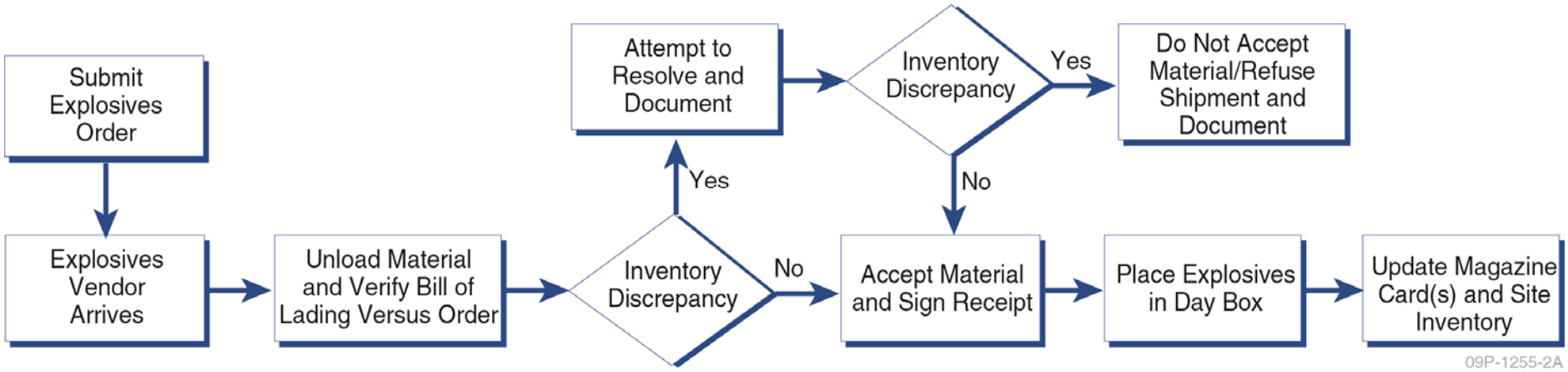


Clark County Public Works

FIGURE 5
QUALITY CONTROL PROCESS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



Clark County Public Works

FIGURE 6
RECEIPT OF EXPLOSIVES MATERIAL PROCESS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

TABLES

Table 1
Demolition Notification Roster

Point of Contact	Affiliation	Phone	Comment/ email
Jerry Barnett, PE	Clark County PM	(360) 566-6992	Jerry.Barnett @clark.wa.gov
Greg Johnson	Clark County Munitions Safety Advisor	(360) 566-6993	Greg.Johnson@clark.wa.gov
Dispatch	Local Fire Department	911	N/A
Dispatch	Local Law Enforcement	911	N/A
N/A	Portland International Airport	(877) 739-4636	N/A

Table 2
Munitions Observed or Potentially Used at CVFAW

MUNITION ITEM DESCRIPTION
Small Arms, General
Small Arms, 12 Gauge
Cartridge, 14.5-mm, Trainer-Spotter, M183A1
Shell, Fixed, 37-mm, HE, MKII
Shell, Fixed, 37-mm, HE, M54 with Self Destruct Tracer
Shell, Fixed, 37-mm, HE, M54
Shot, 37-mm, AP, M74 with Tracer
Shot, Fixed, APC, 37-mm, M59
Projectile, 37-mm, Practice, M55A1
Cartridge, 37-mm, TP, M63 MOD 1
Cartridge, 40-mm, AP-T, M81
Projectile, 40-mm, HE, HE-I, MK 2
Cartridge, 40-mm, Practice, M382
Cartridge, 40-mm, Practice, M385
Cartridge, 40-mm, HE, M406
Cartridge, 40-mm, Practice, M781
Shell, 75-mm, High Explosive, M48
Cartridge, 75-mm, HE, M309A1 Recoilless Rifle
Shell, Fixed, 3 inch, HE, MK IX
Shell, Fixed, 3-Inch, HE, M42 Series
Shell, Fixed, Practice, 3-Inch, M42B2
Shot, Fixed, 3-Inch, AP, M79
Cartridge, 105-mm, HE, M1
Cartridge, 105-mm, TP-T, M67
Cartridge, 105-mm, HEAT-T, M622
Cartridge, 105-mm, Illuminating, M314A3
Cartridge, 105-mm, Smoke, WP, M60 Series
Projectile, 155-mm, AP, M112
Projectile, 155-mm, HE, Mk I Series
Projectile, 155-mm, Smoke, WP, M110 Series
Projectile, 155-mm, HE, M107
Projectile, 155-mm, Illum, M118 Series
Propelling Charge, 155-mm, M3 Series
Propelling Charge, 155-mm, M4 Series
Mortar, 60-mm, HE, M49A2
Cartridge, 60-mm, Illuminating, M83 Series

MUNITION ITEM DESCRIPTION
Cartridge, 60-mm, Training, M69
Cartridge, 60-mm, SABOT M3
Cartridge, 22-mm, Sub-caliber, Practice M744
Cartridge, 22-mm, Sub-caliber, Practice M745
Cartridge, 22-mm, Sub-caliber, Practice M746
Cartridge, 22-mm, Sub-caliber, Practice M747
Shell, 81-mm, HE and Practice, M43A1
Cartridge, 81-mm, Smoke, WP, M370
Cartridge, 81-mm, Illuminating, M301 Series
Cartridge, 81-mm, SABOT, M1
Cartridge, 81-mm, Training, M68
Trench Mortar, 3-Inch, HE, MK I, MK II
Trench Mortar, Practice, 3-Inch, MK III
Cartridge, 4.2-Inch, Illum, M335A2
Cartridge, 4.2-Inch, HE, M3 Series
Mortar, 4.2-Inch, Smoke, WP, M328
Cartridge, 4.2-Inch, Smoke, PWP or WP, M2 Series
Rocket, 2.36-Inch, Anti-tank, M6A1
Rocket, 2.36-Inch, Practice, M7
Rocket Motor, 2.75-Inch, MK40 Mod 7
Rocket, 3.5-Inch, HEAT, M28
Rocket, 3.5-Inch, Practice, M29
Rocket,66-mm, HEAT, M72 Series
Rocket, 35-mm, Sub-caliber, M73
Missile, Sparrow, Aim-7E3
Missile, Sparrow, Aim-7F/M
Grenade, Fragmentation, Delay, M26 Series
Grenade, Fragmentation, Delay, M33
Grenade, Fragmentation, Delay, Mk II Series
Grenade, Hand, Training, Mk IA1
Rifle Grenade, Smoke, WP, M19A1
Rifle Grenade, Smoke, M22
Rifle Grenade, Practice, M11A2
Rifle Grenade, Antitank, M9A1
Rifle Grenade, Fragmentation, M17
Grenade, Smoke, WP, M15
Grenade, Hand, Tear, CN, M7 Series
Grenade, Smoke, M18 with fuze

MUNITION ITEM DESCRIPTION
Grenade, Smoke, M201 Series
Grenade, Smoke, HC, AN-M8
Mine, Anti-personal, Practice, M68
Mine, Anti-Tank, M7A1
Mine, Anti-Tank, M1A1
Signals, Illumination, Ground, Parachute, Red Star, M126A1
Signal, Illumination, Ground, Parachute, White Star, M127A1
Signal, Illumination, Ground, Parachute, Green Star, M195
Simulator, Projectile, Ground Burst, M115A2
Simulator, Grenade, Hand, M116A1
Simulator, Boobytrap, Flash, M117
Simulator, Boobytrap, Illuminating, M118
Simulator, Boobytrap, Whistling, M119

Table 3
Field Activity Quality Requirements

Objective	Activity	Activity Quality Requirement	Quality Control Verification
Prepare Site	Mobilization and Site Preparation	Mobilize equipment and personnel, and prepare site as described in the Work Plan.	▪ Daily Site Health and Safety Meeting Report ▪ Field Logbooks
Site Work	Digital Geophysical Mapping	Operators employ EM61-MKII based systems to detect the presence of conductive subsurface items which may represent MEC or MD.	▪ Daily instrument checks at IVS to verify performance of each instrument and operator. ▪ Blind QC Seed program ▪ Final GeoQC checks to determine efficacy of DGM methods as related to actual items recovered.
	Analog Operations	Operators locate all items within the instrument verification strip using handheld analog instrument	▪ Daily instrument checks at IVS to verify performance of each instrument and operator.
	Visual Identification of MEC/MPPEH/ MD and metallic items	MEC/MPPEH/MD and metal will be inspected by a minimum of two UXO-qualified technicians. The UXOQCS will randomly observe this inspection process.	▪ DQCR ▪ Daily Site Health and Safety Meeting Report ▪ Daily Equipment Checklist ▪ Weekly Status Report ▪ QA Audit Checklist and Audit Form. ▪ Health and Safety Compliance Inspection ▪ Field Logbooks
	Surface and sub-surface MEC/ MPPEH/MD and metal transport, removal and disposal	Site inspection by UXOQCS to inspect a minimum of 10% of the area cleared by the UXO Team to verify thoroughness of MEC/ MPPEH/MD and metal removal.	▪ Preparatory/Initial/Follow-up Report ▪ DQCR ▪ Daily Site Health and Safety Meeting Report ▪ Daily Equipment Checklist ▪ Weekly Status Report ▪ QA Audit Checklist and Audit Form. ▪ Health and Safety Compliance Inspection ▪ Form 1348 ▪ Field Logbooks
	Demobilization	Demobilize equipment and personnel according to schedule.	▪ Daily Site Health and Safety Meeting Report ▪ Weekly Status Report ▪ Health and Safety Compliance Inspection ▪ Field Logbooks

Table 4
Notification List

Title	Name	Telephone Number
Clark County PM	Jerry Barnett, PE	office: 360-566-6992
Clark County Munitions Safety Advisor	Greg Johnson, Master EOD	office: 360-566-6993 cell: 360-229-0529
WESTON SUXOS	Bruce Moe	cell: 831-240-1386
WESTON UXO Safety Officer	Randy Schneider	cell: 360-949-0225
WESTON UXOQCS	Mike Everman	cell: 360-9295725
WESTON PM	George Overby	office: 864.399.9902 cell: 864.320.3409
WESTON MEC Program Quality Manager	Al Larkins	office: 410-696-7260 cell: 443-280-7049
WESTON MEC Response and Removal Task Manager	Tony Clark	cell: 831-998-1616
Local Authorities, as directed	Department of Emergency Services	911
Bureau of Alcohol, Tobacco, Firearms and Explosives	N/A	800-461-8841

APPENDIX A
REQUEST FOR PROPOSAL 614

RFP # 614
PROFESSIONAL, TECHNICAL AND EXPERT SERVICES

Clark County Washington
Release date: October 19, 2011

Request for Proposal for:

REMEDIAL ACTION FOR CAMP BONNEVILLE MILITARY RESERVATION

PROPOSALS DUE: November 9, 2011 at 4:30 p.m.

Proposal(s) shall be sealed and clearly marked on the package cover with RFP #, Project Title and Company name.

Submit one (1) original, one (1) CD and five (5) complete copies of the Proposal to:

Clark County
Office of Purchasing
P.O. Box 5000
1300 Franklin Street, 6th Floor, Suite 650
Vancouver, Washington 98660
(360) 397-2323

Refer Questions to:

Jerry Barnett, Department of Public Works
Jerry.Barnett@clark.wa.gov

General Terms and Conditions

ADMINISTRATIVE REQUIREMENTS - Contractors shall comply with all management and administrative requirements established by Washington Administrative Code (WAC), the Revised Code of the State of Washington (RCW), and any subsequent amendments or modifications, as applicable to providers licensed in the State of Washington.

ALL proposals submitted become the property of Clark County. It is understood and agreed that the prospective proposer claims no proprietary rights to the ideas and written materials contained in or attached to the proposal submitted. Clark County has the right to reject or accept proprietary information.

AUTHORSHIP - Applicants must identify any assistance provided by agencies or individuals outside the proposers own organization in preparing the proposal. No contingent fees for such assistance will be allowed to be paid under any contract resulting from this RFP.

CANCELLATION OF AWARD - Clark County reserves the right to immediately cancel an award if the contractual agreement has not been entered into by both parties or if new state regulations or policy make it necessary to change the program purpose or content, discontinue such programs, or impose funding reductions. In those cases where negotiation of contract activities are necessary, Clark County reserves the right to limit the period of negotiation to sixty (60) days after which time funds may be unencumbered.

CONFIDENTIALLY: Proposer shall comply with all applicable state and federal laws governing the confidentiality of information."

CONFLICT OF INTEREST - All proposals submitted must contain a statement disclosing or denying any interest, financial or otherwise, that any employee or official of Clark County or the appropriate Advisory Board may have in the proposing agency or proposed project.

CONSORTIUM OF AGENCIES - Any consortium of companies or agencies submitting a proposal must certify that each company or agency of the consortium can meet the requirements set forth in the RFP.

COST OF PROPOSAL & AWARD - The contract award will not be final until Clark County and the prospective contractor have executed a contractual agreement. The contractual agreement consists of the following parts: (a) the basic provisions and general terms and conditions, (b) the special terms and conditions, (c) the project description and goals (Statement of Work), and (d) the budget and payment terms. Clark County is not responsible for any costs incurred prior to the effective date of the contract. Clark County reserves the right to make an award without further negotiation of the proposal submitted. Therefore, the proposal should be submitted in final form from a budgetary, technical, and programmatic standpoint.

DISPUTES: Clark County encourages the use of informal resolution to address complaints or disputes arising over any actions in implementing the provisions of this RFP. Written complaints should be addressed to Clark County – Purchasing, P.O. Box 5000, Vancouver, Washington 98666-5000.

DIVERSITY IN EMPLOYMENT AND CONTRACTING REQUIREMENTS - It is the policy of Clark County to require equal opportunity in employment and services subject to eligibility standards that may be required for a specific program. Clark County is an equal opportunity employer and is committed to providing equal opportunity in employment and in access to the provision of all county services. Clark County's Equal Employment Opportunity Plan is available at http://www.clark.wa.gov/hr/documents.html This commitment applies regardless of race, color, religion, creed, sex, marital status, national origin, disability, age, veteran status, on-the-job injury, or sexual orientation. Employment decisions are made without consideration of these or any other factors that are prohibited by law. In compliance with department of Labor Regulations implementing Section 504 of the rehabilitation Act of 1973, as amended, no qualified handicapped individual shall be discriminated against in admission or access to any program or activity. The prospective contractor must agree to provide equal opportunity in the administration of the contract, and its subcontracts or other agreements.

ENVIRONMENTALLY RESPONSIBLE PURCHASING PROGRAM - Clark County has implemented an Environmentally Responsible Purchasing Policy with a goal to reduce negative impacts on human health and the environment. Negative environmental impacts include, but are not limited to, greenhouse gases, air pollution emissions, water contamination, waste from the manufacturing process and waste in packaging. This policy also seeks to increase: 1) water and energy efficiency; 2) renewable energy sources; 3) use of products with recycled content; 4) product durability; 5) use of products that can be recycled, reused, or composted at the end of its life cycle. Product criteria have been established on the Green Purchasing List http://www.clark.wa.gov/general-services/purchasing/erp/environmental.html

INDEPENDENT PRICE DETERMINATION - The prospective contractor guarantees that, in connection with this proposal, the prices and/or cost data have been arrived at independently, without consultation, communication, or agreement for the purpose of restricting competition. This does not preclude or impede the formation of a consortium of companies and/or agencies for purposes of engaging in jointly sponsored proposals.

LIMITATION - This RFP does not commit Clark County to award a contract, to pay any costs incurred in the preparation of a response to this RFP, or to procure or contract for services or supplies.

LATE PROPOSALS - A proposal received after the date and time indicated above will not be accepted. No exceptions will be made.

ORAL PRESENTATIONS: An oral presentation may be required of those prospective contractors whose proposals are under consideration. Prospective contractors may be informed that an oral presentation is desired and will be notified of the date, time and location the oral presentation is to be conducted.

OTHER AUDIT/MONITORING REQUIREMENTS - In addition, auditing or monitoring for the following purposes will be conducted at the discretion of Clark County: Fund accountability; Contract compliance; and Program performance.

PRICE WARRANT - The proposal shall warrant that the costs quoted for services in response to the RFP are not in excess of those which would be charged any other individual or entity for the same services performed by the prospective contractor.

PROTESTS must be submitted to the Purchasing Department.

REJECTION OF PROPOSALS - Clark County reserves the right to accept or reject any or all proposals received as a result of this RFP, to negotiate with any or all prospective contractors on modifications to proposals, to waive formalities, to postpone award, or to cancel in part or in its entirety this RFP if it is in the best interest of Clark County to do so.

SUBCONTRACTING - No activities or services included as a part of this proposal may be subcontracted to another organization, firm, or individual without the approval of Clark County. Such intent to subcontract shall be clearly identified in the proposal. It is understood that the contractor is held responsible for the satisfactory accomplishment of the service or activities included in a subcontract.

VERBAL PROPOSALS: Verbal proposals will not be considered in making the award of any contract as a result of this RFP.

WORKERS COMPENSATION INSURANCE – The contractor shall comply with R.C.W. Title 51- with minimum coverage limits of $500,000 for each accident, or provide evidence that State law does not require such coverage.

FOR ALTERNATIVE FORMATS
Clark County ADA Office; V (360) 397-2025;
TTY (360) 397-2445; ADA@Clark.wa.gov

Request for Proposals
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Part I: Proposal Requirements

Section IA - General Information

1. Introduction

The purpose of this Request for Proposal (RFP) is to obtain, in a full and open competition, proposals for consulting, engineering, and environmental remediation services for Munitions and Explosives of Concern (MEC) Munitions Debris (MD) Munitions Potentially Presenting an Explosive Hazard (MPPEH) and lead impacted soils at the Camp Bonneville Military Reservation (CBMR) on behalf of Clark County.

This RFP seeks proposals that address required services and, at the Proposer's option, optional services. Those services are generally described below. The proposal should include all of the field operations, documentation and administrative work in support of the scope of work, MEC/MD demilitarization and disposal, monthly project manager's meetings, quarterly advisory group meetings and monthly progress reports. A more detailed description of the services sought is set out in Section IB of this RFP.

All documents mentioned in this RFP can be found in the Contractor Data Package at the Clark County FTP site: ftp8.clark.wa.gov

Select the link: PW-rfp
If prompted, the user name is 'anonymous' and password is your email address.
The folders and docs will all be read-only.

2. Background

The 3,840-acre CBMR site is located northeast of Vancouver, Washington, in the southeastern region of Clark County. The address is 23201 NE Pluss Road, Vancouver, WA 98682. The property is approximately three miles northeast of the corporate limits of the City of Vancouver, Washington and approximately seven miles north of the Columbia River. The CBMR is located along the western foothills of the Cascade Mountain Range, with Camp Hill and Little Elkhorn Mountain to the northwest, Munsell Hill to the west, and Little Baldy Mountain to the south. Vehicular access to the CBMR is restricted to a single entrance from NE Pluss Road. The entrance is gated and monitored by site security and facility managers.

The mission of CBMR has been to provide a training camp for active, reserve, and guard units of the United States Army, Navy, Marine Corps, and Coast Guard. Training exercises generally included weapons training with small arms, assault weapons, and field and air defense artillery. Between 1909 and 1995, live and practice munitions including artillery and mortar rounds, shoulder-fired rockets, land mines (practice only), grenades, and small-arms ammunitions were stored and used on the Property. In the 1980s, the Property was also used for non-military purposes including religious retreats, picnicking, camping, educational purposes, and pistol training for the State Police. Records indicate that munitions were disposed of by open burning or open detonation (OB/OD). The Property was closed in 1995 by the Base Realignment and Closure (BRAC) commission. The Federal Bureau of Investigation (FBI) operated a small-arms range on the CBMR until 2009.

CBMR was selected in 1995 as a Department of Defense Base Realignment and Closure property. Clark County Government was selected as the Local Redevelopment Authority (LRA) for the property. CBMR was transferred to Clark County in August 2006, prior to the completion of remedial activities, as provided for by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et. seq. This process is known as "early transfer" and is authorized pursuant to 42 U.S.C. § 9620(h)(3)(C). This particular CERCLA early transfer is a conservation conveyance under 10 U.S.C. § 2694(a). A conservation conveyance limits the use of the Property to conservation purposes. As the LRA, Clark County developed a Reuse Plan for the site. Upon successful environmental remediation, the site will eventually be operated as a Regional Park. The Central Valley Floor and Associated Wetlands (CVFAW) is the location

proposed for most of the amenities described in the Reuse Plan including tent camping, yurt camping, an amphitheater, hiking and biking.

From 2006 to present, Clark County obtained funding for the remediation of CBMR through an Environmental Services Cooperative Agreement (ESCA) with the Army. Remediation and characterization activities during that time have further refined the previous site characterization and identified the need for the additional remediation identified in the CAP.

During the 2006-2009 surface clearance of the central valley floor and according to the MEC Logs from this clearance, over 500 munitions items and over 1,000 items of MD were addressed. Material Potentially Presenting an Explosive Hazard (MPPEH) included 2.36 in. rockets, 3 in. Stokes Mortars, rifle grenades, smoke grenades, practice hand grenades, 105 mm HE projectile, M73 rocket practice 35 mm, and M49 trip flares. The likelihood that MEC items are present in the CVFAW is considered moderate to high. Please refer to the MEC Logs for more information.

From August 2006 to September 2009, Clark County's contractor completed the following tasks:

1. Central Impact Target Area (CITA) and firing points soil sampling
2. Surface and Sub-surface MEC clearance of 5 acres of 2.36-Inch Rocket Range
3. Surface MEC clearance of 15 acres in the CITA in and around hard target locations, excluding step-outs
4. Removal of 15 hard targets (e.g. vehicles, appliances) from the CITA to an on-site staging area
5. Demilitarization of 15 hard targets and haul to recycling
6. MEC Construction Support for road work in the CITA
7. Sub-surface MEC clearance of 2 acres of CITA roads
8. MEC Surface Clearance of approximately 50 acres of the Environmental Study Area, completion of AAR, and a WDOE letter of completion for the Environmental Study Area
9. MEC surface clearance of approximately 305 acres of the CVFAW, including some step-outs
10. MEC surface clearance of approximately 2 acres of Dense Vegetation/Moderate Slope (Western Slopes)
11. MEC Surface Clearance of approximately 46 miles of the buffer zones on each side of the road and trail footprints
12. MEC Surface Clearance and Brush Removal for Perimeter and CITA Fence Replacement and Repair Construction
13. MEC Surface clearance of approximately 15 miles of fence line perimeter to CITA and Bonneville

WDOE regulates the site through a Prospective Purchaser's Consent Decree (PPCD) that was entered in the Clark County Superior Court under cause number 06-2-05340-4. The PPCD breaks the site up into numbered Remedial Action Units (RAU's). The CVFAW is included in RAU 3 (site wide munitions clearance). The PPCD is currently being amended to reflect changes in ownership and responsibilities for CBMR. The public comment period for the PPCD is October 14th to November 13th. A copy of the PPCD, and any other reference mentioned in this RFP can be found on the Clark County ftp site. The PPCD is subject to amendment.

During the previous investigation, contractors did not accurately delineate the portion of the CVFAW that was surface cleared. Work stopped in 2009. Since that time, vegetation has grown back and erosion/frost heave may have altered conditions.

The final remedies for the CVFAW and other phases (listed below) of RAU 3 (site wide munitions clearance) are described in the CAP and were selected in accordance with the PPCD, Model Toxics Control Act (MTCA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The phases for RAU 3 are:

Phase I (Central Valley Floor and Wetlands)
Phase II (CITA, CITA expansion and Firing Points)
Phase III (Demolition Areas 1&2 and remaining MEC ranges)
Phase IV (Western Slopes)

Based on the results of the previous surface clearance, the Munition with the Greatest Fragmentation Distance (MGFD) for the CVFAW is considered to be the 105mm HE artillery projectile.

Clark County has made all necessary information available from previous actions accessible to the contractors through the site repositories and the Contractor Data Package that specifically addresses the CVFAW at the Clark County FTP site. The Contractor Data Package includes, but is not limited to:

WDOE final Cleanup Action Plans (CAPs) for RAU 2C and RAU 3
Environmental Services Cooperative Agreements (ESCAs)
Final Remedial Investigation/Feasibility Study (RI/FS) for RAU 3 as an appendix to the CAP
MEC and MD finding reports
Anomaly Selection Board Findings
After Action Reports
EM61 Data
Blind Seed Data
Bridge Surveys
Explosive Safety Submissions
Labor Disputes
Riparian Zones

3. Project Funding

The source of funding for this project is limited to funding made available to the County through the ESCA.

4. Timeline for Selection

The following dates are the intended timeline:

Pre-submittal Meeting	November 2nd 2011 (see Part II, Section IIA)
Proposals due	November 9th, 2011
Proposal review/evaluation period	November 14th - December 2nd 2011
Selection committee recommendation	December 2nd 2011
Contract negotiation	December 6th - December 14th 2011
Contract completion/intended to begin	February 1st 2012

5. Employment Verification

"Effective November 1st, 2010, to be considered responsive to any formal Clark County Bid/RFP or Small Works Quote, all vendors shall submit before, include with their response or within 24 hours after submittal, a recent copy of their E-Verify MOU or proof of pending enrollment. The awarded contractor shall be responsible to provide Clark County with the same E-Verify enrollment documentation for each sub-contractor ($25,000 or more) within thirty days after the sub-contractor starts work. Contractors and sub-contractors shall provide a report(s) showing status of new employee's hired after the date of the MOU. The status report shall be directed to the county department project manager at the end of the contract, or annually, which ever comes first. E-Verify information and enrollment is available at the Department of Homeland Security web page: www.dhs.gov/E-Verify

How to submit the MOU in advance of the submittal date:
1. Hand deliver to 1300 Franklin St, Suite 650, Vancouver, WA 98660, or;
2. Fax to (360) 397-6027, or;
3. Call Purchasing at (360) 397-2323 for a current email address.

Section IB - Work Requirements

1. Required Services

A. Subsurface Clearance of Central Valley Floor and Associated Wetlands and Step-Outs

Conduct a subsurface Munitions and Explosives of Concern (MEC) clearance of the CVFAW (approximately 432 acres) to a depth of 14" below ground surface (BGS). Of the 432 acres, approximately 120 acres are wetlands. The wetlands will require special brush cutting procedures during the dry season for environmental protection and thorough coverage. The likelihood that MEC items are present in the CVFAW is considered moderate to high.

Conduct a surface clearance of any step out grids that may need to be cleared. The CAP for RAU 3 requires 100'x100' surface step-out clearance procedures for cases in which MEC or MD are found in the boundary grids of the CVFAW.

The following tasks apply to the required work for the Central Valley Floor and Associated Wetlands and Step-Outs:

Task 1 – Permits, Work Plans, and all other Federal, State, Local and Tribal Government Requirements to Complete the CVFAW Clearance

The contractor shall prepare a Conventional MEC Type II Work Plan for submission to and approval by WDOE and in accordance with DID MR-005-01. The contractor is expected to submit "draft", "draft final" and "final" versions of the Work Plan. The Work Plan shall include an Accident Prevention Plan (APP), Project Quality Control Plan (PQCP), and an Environmental Protection Plan (EPP) per the DID. The plans and attachments will be forwarded to Clark County project manager for submission to WDOE and the US Army BRAC Division for review. The contractor will be expected to submit up to 12 copies each of the "draft", "draft final" and "final" versions of the Work Plan.

Additionally, an Explosives Sighting Plan (ESP) shall be prepared in accordance with MR-005-04 and applicable facility restrictions. "Draft," "draft final" and "final" versions of the ESP shall be submitted per the requirements for a Type II Work Plan. An ESP was prepared for past work efforts and has been used by several of the contractors on the site. The contractor will need to research this previously approved ESP and confirm it will meet their needs for this work.

Additionally, an Explosives Management Plan (EMP) shall be prepared in accordance with MR-005-03 and applicable facility restrictions. "Draft", "draft final" and "final" versions of the EMP shall be submitted per the requirements for a Type II Work Plan.

The contractor shall prepare a Disposal Feasibility Letter (DFL) to document offsite MPPEH disposal alternatives. The contractor will be solely responsible for any offsite MPPEH disposal or situations that may arise from this action.

The contractor shall acquire the necessary permits and approvals to conduct the work at Camp Bonneville to include an Explosive Safety Submission (ESS). The ESS shall be prepared and submitted to USATECES based upon the contractors chosen technical approach. Clark County has submitted a draft ESS to USATECES and will assist the contractor in their submission.

Task 2 - Location Surveying, Mapping and GIS Plan

Location surveying and mapping shall be in accordance with DID MR-005-07 and the approved Work Plan. The coordinate system used for the work must be acceptable by all stakeholders. All survey work shall be performed under the direction of a Professional Land Surveyor licensed in the State of Washington. MEC and non-MEC anomaly locations shall be located to the nearest 1

foot. The contractor shall locate and/or establish a minimum number of control monuments to achieve this. Survey data shall be submitted prior to commencement of work for Site Grid Data.

Survey data may be submitted electronically by CD. Others methods of submittal must be proposed and approved by the cleanup team. The site grid data shall include a map of the entire site with grids and other pertinent feature shown. MEC and MD location data shall be submitted to the cleanup team monthly at the project coordinators meetings. Data shall include a high quality i.e. (Arcview GIS) legible paper map showing the following; electronic color photograph, grid number where found, item number assigned, type of item, location coordinates to nearest foot, and depth below ground surface. All survey data shall be included in the Site-Specific After Action Report (AAR).

The Contractor shall establish and manage a GIS in accordance with DID MR-005-14 Geographical Information System (GIS) Plan. The Contractor shall submit the GIS data in a format compatible with the ESRI (arcview/arcinfo) system.

Delivery of exportable, search enabled database that captures field/anomaly investigation and MEC/MD MPPEH find data such as geographic location (in appropriate datum/coordinate system), reference grid location, quantity, type, depth, positioning, condition, and disposal/handling information. Delivery of all GIS project files, DGM geo-tiffs, relevant CADD site drawings, and other referenced data sources (e.g., USGS topography) should be included in interim and final data packages.

Task 3 - Site Facilities, Access and Contractor Office and Shop Buildings

Buildings are available for office, shop and equipment storage. Internet (T1) and telephone lines are also available on site. The use of these facilities shall be negotiated through Clark County.

Task 4 - Vegetation Removal

Prior to reacquisition of anomalies, all vegetation that would interfere with reacquisition and intrusive investigation activities shall be removed. No root removal or other intrusive activity will be performed. This activity will be accomplished under the oversight of Unexploded Ordnance (UXO) personnel, per the approved project APP.

Task 5 - Geophysical Target Reacquisition

The contractor shall select and propose the most efficient technology platform (sensors and positioning system) for reacquisition of anomalies (targets) for removal and remediation. The proposed platform shall meet the objectives of the removal action and shall be in accordance with the approved Work Plan.

<u>Historical Geophysical Data Review and Evaluation</u>
The contractor should review and evaluate the data associated with all previous Investigations and utilize this information in their proposals.

<u>Geophysical Test Plot</u>
A geophysical test plot shall be used to demonstrate and evaluate the skill, ability, technique, procedures and equipment (e.g., comparable technology as used during the original survey) for anomaly reacquisition, and to ensure compliance with the target reacquisition data quality objectives. The geophysical test plot shall be performed on-site at a location agreed upon by WDOE and the contractor, and shall be seeded with items that simulate the MEC/MPPEH discovered during the previous site investigations.

There are several test plots available at CBMR that have been seeded and approved by WDOE. The data for these test plots is available from WDOE on a sequestered basis with the contractor's independent QA/QC staff.

Anomaly Reacquisition
The contractor shall, utilizing UXO qualified personnel, as outlined in DDESB TP-18, implement the removal action as specified in the approved Work Plans, ESS and associated project documents. The contractor shall provide all necessary personnel and equipment to perform the removal action, including reacquisition, verification, removal, and disposal of the anomalies identified. This two-step task, including (1) relocation and (2) verification/refinement of anomaly locations, will be managed by the contractor's site geophysicist and Anomaly Selection Board (ASB) as outlined in USAESCH DID OE-025.02 and the Camp Bonneville PPCD. The ASB will consist of voting members from WDOE, Clark County and the Army. The contractor shall present the requested data but will not be a voting member or participant.

Task 6 - Intrusive Response Action

The following subtasks identify the project standards for the intrusive investigation, including the removal and handling MEC in accordance with the CAP for RAU 3:
Maximum Depth of Anomaly Removal
Excavate and clear geophysical anomalies in the CVF to 14" BGS. Notify the Clark County, WDOE and Army Project Managers if any significant anomalies are detected below 14" BGS for ASB consideration.

Accessing Anomalies
The anomalies shall be accessed using method(s) proposed by the contractor and appropriate to the objectives of the removal action.

Backfilling Excavations
All access/excavation/detonation holes shall be backfilled by the contractor. The contractor shall restore such areas to their prior condition with seeds and methods approved for local requirements in accordance with the approved Work Plan and EPP.

Accountability, Destruction and Certification
The contractor shall maintain a detailed accounting of all UXO, Munitions Debris, and Discarded Military Munitions (DMM) encountered and excavations performed. The accounting shall include the amounts of UXO, Munitions Debris and DMM, identification and condition of the items, depth located and orientation of the items, location coordinates and disposition of the items. The accounting system shall also account for demolition materials utilized for the disposal of all UXO. This accounting shall be a part of an appendix to the Site-Specific AAR.

The contractor shall be responsible for the disposal of MEC items found during the clearance. MEC items that are acceptable to move will be moved to the existing munitions disposal site in the CITA for destruction. MEC items that are unsafe to move will be Blown in Place (BIP). The Contractor shall establish the method of destruction in the site-specific work plan. All MEC destruction activities shall be in accordance with USACE guidance documents and Technical Manual 60A-1-1-31. The contractor shall supply demolition materials and equipment to handle demolition of MEC items encountered that cannot be moved to the CITA for destruction. A fenced storage magazine area for project demolition materials is available on site. In accordance with DOD 4160.21-M, Chapter 4, Paragraph 3(8), the contractor shall certify demilitarized munitions debris from site activities, as free of explosive residue and transport debris to an offsite scrap-metal recycler with a smelter.

Munitions Debris
Munitions Debris shall be handled in accordance with DOD Instruction 4140.62 *Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH)*. Certify Munitions Debris as free of explosive residue and transport debris to an offsite scrap-metal recycler with a smelter**.**

Range Debris
Clear anomalies found to 14" depth and verify nature of the anomalies identified. The nature of these anomalies will be documented to the extent that it is apparent that these anomalies are not MEC or MPPEH. At a minimum, this will include a photograph of the item producing the anomaly with descriptive text (size, shape, depth, etc.). In addition, the location of the item producing the anomaly will be documented. Non-MEC scrap shall be removed and appropriately disposed offsite.

Task 7 - Restore all roads, conveyance systems and infrastructure to pre-clearance state, or better.

Task 8 - Project Quality Control

The contractors site geophysicist will perform 100% post-dig geophysical QC of all selected anomalies identified by the ASB to confirm that the recovered objects are appropriate for the anomaly peak response recorded during the target reacquisition task.

Additionally Clark County will conduct its own QC as it deems necessary; all intrusive QC failures shall require 100% reinvestigation. A pattern or frequent failure rate of greater than 5% could lead to withholding of payment and or contract termination at any time.

Task 9 - Disclosure

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 Clark County Public Works Project Manager. Reports and data generated under this contract are the property of Clark County.

The contractor may be asked to attend quarterly meetings of the Camp Bonneville Advisory Group (CAG). Clark County will facilitate the meetings. The contractor's Project Manager may be asked to present findings and issues.

Task 10 - After Action Report (AAR) and Notice of Completion

The contractor shall prepare and submit a final Site-Specific AAR in accordance with DID MR-030. The contractor is expected to submit "draft", "draft final" and "final" versions. The Site-Specific AAR will be forwarded to Clark County, WDOE, US Army BRAC Division. The contractor will be expected to submit up to 12 copies each of the "draft", "draft final" and "final" versions of the Site-Specific AAR. The contractor must obtain a Notice of Completion from WDOE for the CVFAW subsurface clearance.

B. Pilot Study of the Western Slopes Area

Conduct a surface MEC clearance of 50 acres of the Western Slopes Area adjacent to the CVFAW. The Proposer shall prepare a work plan to conduct the Pilot Study for review and approval by WDOE, the County and the U.S. Army BRAC Division. The contractor will need to choose the locations of the 50 acres and provide a justification for the choice of these locations. Upon the completion of the Pilot Study, the technical results, findings, conclusions, recommendations, and cost estimates will be briefed to the County, the Army, and WDOE and documented in a Technical Information Report. Proposers are to provide a firm fixed price for the provision of a work plan for the Pilot Study and a firm fixed price for the execution of the work plan and preparation of the Technical Information Report assuming the work plan is approved.

The following tasks apply to this work:

Task 1 –Work Plans, Permits and all other Federal, State, Local and Tribal Government Requirements to Complete the CVFAW Clearance

The contractor shall prepare a Conventional MEC Type II Work Plan for submission to and approval by WDOE and in accordance with DID MR-005-01. The contractor is expected to submit "draft", "draft final" and "final" versions of the Work Plan. The Work Plan shall include an Accident Prevention Plan (APP), Project Quality Control Plan (PQCP), and an Environmental Protection Plan (EPP) per the DID. The plans and attachments will be forwarded to Clark County project manager the for submission to WDOE and the US Army BRAC Division for review and approval. The contractor will be expected to submit up to 12 copies each of the "draft", "draft final" and "final" versions of the Work Plan.

Additionally, an Explosives Sighting Plan (ESP) shall be prepared in accordance with MR-005-04 and applicable facility restrictions. "Draft," "draft final" and "final" versions of the ESP shall be submitted per the requirements for a Type II Work Plan. An ESP was prepared for past work efforts and has been used by several of the contractors on the site. The contractor will need to research this previously approved ESP and confirm it will meet their needs for this work.

Additionally, an Explosives Management Plan (EMP) shall be prepared in accordance with MR-005-03 and applicable facility restrictions. "Draft", "draft final" and "final" versions of the EMP shall be submitted per the requirements for a Type II Work Plan.

The contractor shall prepare a Disposal Feasibility Letter (DFL) to document offsite MPPEH disposal alternatives. The contractor will be solely responsible for any offsite MPPEH disposal or situations that may arise from this action.

The contractor shall acquire the necessary permits and approvals to conduct the work at Camp Bonneville to include an Explosive Safety Submission (ESS). The ESS shall be prepared and submitted to USATECES based upon the contractors chosen technical approach. Clark County has submitted a draft ESS to USATECES and will assist the contractor in their submission.

If the work plan called for in Task 1 is approved, then Tasks 2 – 10 will apply.

Task 2 - Location Surveying, Mapping and GIS Plan

Location surveying and mapping shall be in accordance with DID MR-005-07 and the approved Work Plan. The coordinate system used for the work must be acceptable by all stakeholders. All survey work shall be performed under the direction of a Professional Land Surveyor licensed in the State of Washington. MEC and non-MEC anomaly locations shall be located to the nearest 1 foot. The contractor shall locate and/or establish a minimum number of control monuments to achieve this. Survey data shall be submitted prior to commencement of work for Site Grid Data.

Survey data may be submitted electronically by CD. Others methods of submittal must be proposed and approved by the cleanup team. The site grid data shall include a map of the entire site with grids and other pertinent feature shown. MEC and MD location data shall be submitted to the cleanup team monthly at the project coordinators meetings. Data shall include a high quality i.e. (Arcview GIS) legible paper map showing the following; electronic color photograph, grid number where found, item number assigned, type of item, location coordinates to nearest foot, and depth below ground surface. All survey data shall be included in the Site-Specific After Action Report (AAR).

The Contractor shall establish and manage a GIS in accordance with DID MR-005-14 Geographical Information System (GIS) Plan. The Contractor shall submit the GIS data in a format compatible with the ESRI (arcview/arcinfo) system.

Delivery of exportable, search enabled database that captures field/anomaly investigation and MEC/MD MPPEH find data such as geographic location (in appropriate datum/coordinate system), reference grid location, quantity, type, depth, positioning, condition, and disposal/handling information. Delivery of all GIS project files, DGM geo-tiffs, relevant CADD site drawings, and other referenced data sources (e.g., USGS topography) should be included in interim and final data packages.

Task 3 - Site Facilities, Access and Contractor Office and Shop Buildings

Buildings are available for office, shop and equipment storage. Internet (T1) and telephone lines are also available on site. The use of these facilities shall be negotiated through Clark County.

Task 4 - Vegetation Removal

Prior to reacquisition of anomalies, all vegetation that would interfere with reacquisition and intrusive investigation activities shall be removed. No root removal or other intrusive activity will be performed. This activity will be accomplished under the oversight of Unexploded Ordnance (UXO) personnel, per the approved project APP.

Task 5 – Surface Clearance Target acquisition

The contractor shall select and propose the most efficient technology platform (sensors and positioning system) for detection of anomalies (targets) for removal and remediation. The proposed platform shall meet the objectives of the removal action and shall be in accordance with the approved Work Plan.

Historical Data Review and Evaluation
The contractor should review and evaluate the data associated with all previous Investigations in the Western Slopes area and utilize this information in their proposals.

Anomaly detection and removal
The contractor shall, utilizing UXO qualified personnel, as outlined in DDESB TP-18, implement the removal action as specified in the approved Work Plans, ESS and associated project documents. The contractor shall provide all necessary personnel and equipment to perform the removal action, including detection, verification, removal, and disposal of the anomalies identified.

Task 6 – Surface Clearance Response Action

Accountability, Destruction and Certification
The contractor shall maintain a detailed accounting of all UXO, Munitions Debris, and Discarded Military Munitions (DMM) encountered and removed/disposed of. The accounting shall include the amounts of UXO, Munitions Debris and DMM, identification and condition of the items, location coordinates and disposition of the items. The accounting system shall also account for demolition materials utilized for the disposal of all UXO. This accounting shall be a part of an appendix to the Site-Specific AAR.

The contractor shall be responsible for the disposal of MEC items found during the surface clearance. MEC items that are acceptable to move will be moved to the existing munitions disposal site in the CITA for destruction. MEC items that are unsafe to move will be Blown in Place (BIP). The Contractor shall establish the method of destruction in the site-specific work plan. All MEC destruction activities shall be in accordance with USACE guidance documents and Technical Manual 60A-1-1-31. The contractor shall supply demolition materials and equipment to handle demolition of MEC items encountered that cannot be moved to the CITA for destruction. A fenced storage magazine area for project demolition materials is available on site. In accordance with DOD 4160.21-M, Chapter 4, Paragraph 3(8), the contractor shall certify demilitarized munitions debris from site activities, as free of explosive residue and transport debris to an offsite scrap-metal recycler with a smelter.

Munitions Debris

Munitions Debris shall be handled in accordance with DOD Instruction 4140.62 *Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH)*. Certify Munitions Debris as free of explosive residue and transport debris to an offsite scrap-metal recycler with a smelter**.**

Range Debris

Verify nature of the anomalies identified. The nature of these anomalies will be documented to the extent that it is apparent that these anomalies are not MEC or MPPEH. At a minimum, this will include a photograph of the item producing the anomaly with descriptive text (size, shape, etc.). In addition, the location of the item producing the anomaly will be documented. Non-MEC scrap shall be removed and appropriately disposed offsite.

Task 7 - Restore all roads, conveyance systems and infrastructure to pre-clearance state, or better.

Task 8 - Project Quality Control

The contractors site QC will perform 100% QC of all selected surface cleared grids.

Additionally Clark County will conduct its own QC as it deems necessary; all surface QC failures shall require 100% reinvestigation at a minimum. A pattern or frequent failure rate of greater than 5% could lead to withholding of payment and or contract termination at any time.

Task 9 - Disclosure

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 Clark County Public Works Project Manager. Reports and data generated under this contract are the property of Clark County.

The contractor may be asked to attend quarterly meetings of the Camp Bonneville Advisory Group (CAG). Clark County will facilitate the meetings. The contractor's Project Manager may be asked to present findings and issues.

Task 10 – After Action Report (AAR) and Technical Information Report

The contractor shall prepare and submit a final Site-Specific AAR in accordance with DID MR-030. The contractor shall also prepare a Technical Information Report that describes the findings of the Pilot Study and makes recommendations for the remediation of the Western Slopes. The contractor shall submit "draft", "draft final" and "final" versions. The Site-Specific AAR and Technical Information Report will be forwarded to Clark County, WDOE, US Army BRAC Division, and the administrative record and up to four local county repositories as deemed necessary by the Clark County Project manager. The contractor will be expected to submit up to 12 copies each of the "draft", "draft final" and "final" versions of the Site-Specific AAR and Technical Information Report.

2. Optional Services:

A. Lead Impacted Soils. Provide consulting services to assist the county in the preparation of an amendment to the CAP to propose an alternative approach to the remediation of lead-impacted soils at 2 former firing ranges based on the newly acquired data (June 2011). The 2 ranges to be remediated include approximately 5 acres in the Pop-Up Pond Overshoot Area (directly behind RAU 2A-21) and approximately 2 acres on the range floor of the 1000" Inch range (RAU 2A-16). If the amendment is approved by WDOE, the contractor and the County will negotiate a price for executing the remediation and preparing the After Action Report (AAR) for the entire RAU 2A. Provide a rate or rates for the provision of this service.

B. Future Phases of Cleanup. Based on the contractor's performance (scope, schedule, quality, cost and results) the County reserves the right to negotiate solely with the selected contractor for the cleanup of the remaining Phases (listed below) defined by the WDOE CAP and PPCD for RAU 3 which are:

Phase II (CITA, CITA expansion and Firing Points)
Phase III (Demolition Areas 1&2 and remaining MEC ranges)
Phase IV (Western Slopes)

3. County Performed Work

Clark County will assist in developing a Conventional Explosives Safety Submission (ESS) in accordance with DID MR-060 and EP 385-1-95b for the work described in this RFP. The MGFD for the CVFAW Areas is considered to be the 105mm HE Projectile. The contractor will finalize the ESS and submit.

Clark County staff will be located at CBMR for the duration of the project.

4. Place of Performance

Contract performance to occur at CBMR.

5. Period of Performance

The services are intended to begin in February 2012 and be completed by March 2015.

Clark County also reserves the right, based on performance of this statement of work, to enter into contracts for the future phases of the CAP with the selected contractor without another competitive bid solicitation.

6. Public Safety

Public safety will require limiting access to CBMR. The successful proposer's employees and agents shall carry sufficient identification to show by whom they are employed and display it upon request to site personnel. County project managers have discretion to require the successful proposer's employees and agents to be escorted while on site.

7. Compliance with Laws

The contractor shall comply with all applicable federal, state and local regulations. The contractor will be responsible for making certain that all employees are compensated in accordance with applicable federal and state prevailing wage requirements. Information on a past trade and occupation classifications, settlement and rates may be obtained from:

Trent Harris
Industrial Relations Agent Prevailing Wage Region 4
State of Washington Department of Labor & Industries
711 Vine Street
Kelso, WA 98626-2650
Ph: (360)575-6956
Fax: (360)575-6949
hatr235@lni.wa.gov

8. Insurance

A. Commercial General Liability Insurance

Prior to the signing of a contract, the contractor(s) selected must show evidence of a certificate of commercial general liability for a minimum of $1,000,000 combined single limit. It must be an occurrence based form and annually renewing, Clark County shall be named as an additional insured in this contract, not the ACORD

form. There shall be no exclusions dealing with explosives or hazardous materials.

B. Automobile

If the proposer or its employees use motor vehicles in conducting activities under this Contract, liability insurance covering bodily injury and property damage shall be provided by the proposer through a commercial automobile insurance policy. The policy shall cover all owned and non-owned vehicles. Such insurance shall have minimum limits of $1,000,000 per occurrence, combined single limit for bodily injury liability and property damage liability with a $1,000,000 annual aggregate limit. If the proposer does not use motor vehicles in conducting activities under this Contract, then written confirmation to that effect on proposer letterhead shall be submitted by the proposer. If the contractor will haul ammunition, or other hazardous materials found during performance of this contract at Camp Bonneville, the driver, carrier, and insurance on the vehicle will be sufficient to meet State and Federal DOT requirements and will be properly placarded with a certified driver.

C. Professional Liability (aka Errors and Omissions)

The proposer shall obtain, at proposer's expense, and keep in force during the term of this contract Professional Liability insurance policy to protect against legal liability arising out of contract activity. Such insurance shall provide a minimum of $2,000,000 per occurrence, with a maximum deductible of $50,000. It should be an "Occurrence Form" policy. If the policy is "Claims Made", then Extended Reporting Period Coverage (Tail coverage) shall be purchased for three (3) years after the end of the contract. There shall be no exclusions for hazardous material or explosives.

D. Pollution and Asbestos Liability

If hazardous material is encountered during any construction or removal and remediation, the Project Manager must be notified immediately, and if any work is done to remove it, any proposer performing work shall obtain and keep in effect during the term of the contact, Pollution Liability Insurance, including Explosives and Asbestos Liability covering bodily injury, property damage, environmental damage, including any related clean up costs. Combined Single Limit should be a minimum of $1,000,000.00 but clean up costs must be separate. This coverage may be endorsed to either the Errors and Omissions coverage or the CGL Coverage.

E. Proof of Insurance

Proof of Insurance shall be provided prior to the starting of the contract performance. Proof will be on an ACORD Certificate(s) of Liability Insurance, which the proposer shall provide to Clark County. Each certificate will show the coverage, deductible and policy period. It is the proposer's responsibility to provide evidence of continuing coverage during the overlap periods of the policy and the contract.

9. Proposers' List

All proposers are required to be listed on the proposers' list.

✓ Prior to submission of proposal, please confirm your organization is on the Proposers' List.

To view the List, please click on the link below or copy and paste into your browser.
Clark County RFP site: **http://www.clark.wa.gov/general-services/purchasing/rfp.html**

If your organization is NOT listed, submit the 'Letter of Interest" to ensure your inclusion.
See Attachment B. Proposals received by Clark County by proposers not included on the Proposers List may be considered non-responsive.

Part II Proposal Preparation and Submittal

Section IIA - Pre-Submittal Meeting / Clarification

1. Pre-Submittal Meeting

   Two, non-mandatory, pre-submittal informational meetings will be held on Wednesday, November 2, 2011. Contact the person listed on the cover page of this RFP to schedule the visit. The meeting will be at 23201 NE Pluss Road, Vancouver, Washington, 98662. Contractor must check in at building marked Range HQ.

   A map is available for viewing at: http://www.clark.wa.gov/general-services/purchasing/rfp.html

2. Proposal Clarification

   Questions and Requests for Clarification regarding this Request for Proposal must be directed in writing, via email, to the person listed on the cover page. In addition, proposers may bring questions, clearly printed, to the site visit. Unless directed otherwise, please give your questions to Jerry Barnett. Paper and pencils will be available for your use.

   The deadline for submitting such questions/clarifications via e-mail is 5 p.m. November 3, 2011. An addendum will be issued no later than 12:00 p.m. (noon) November 4, 2011, to all recorded holders of the RFP if a substantive clarification is in order.

   All submitted questions, both via email or hard copy, will be addressed on the Q&A no later than November 4th. Vendors should review the Questions and Answer page (link below) for clarifications.

   Each proposer is strongly encouraged to review this document prior to submitting their proposal.

   Clark County RFP site: http://www.clark.wa.gov/general-services/purchasing/rfp.html

Section IIB - Proposal Submission

1. Proposal Submission

   Sealed proposals must be received no later than the date, time and location specified on the cover of this document.

   The outside of the envelope/package shall clearly identify:
   1. RFP Number and;
   2. TITLE and;
   3. Name and address of the proposer.

   Responses received after submittal time will not be considered and will be returned to the proposer - unopened.

   Proposals received with insufficient copies (as noted on the cover of this document) cannot be properly disseminated to the Review Committee and other reviewers for necessary action, therefore, may not be accepted.

2. Proposal

   The proposal must enable readers to understand how the proposer intends to use these public funds and what measurable outcomes are expected to be achieved.

   Proposers are reminded that proposals will be considered exactly as submitted. Points of clarification will be solicited from proposers at the discretion of Clark County. Those proposals determined to not be in compliance with provisions of this RFP and the applicable law and/or regulations will not be processed.

For purposes of review and in the interest of the County, the County encourages the use of submittal materials (i.e. paper, dividers, binders, brochures, etc.) that contain post-consumer recycled content and are readily recyclable.

The County discourages the use of materials that cannot be readily recycled such as PVC (vinyl) binders, spiral bindings, and plastic or glossy covers or dividers. Alternative bindings such as reusable/recyclable binding posts, reusable binder clips or binder rings, and recyclable cardboard/paperboard binders are examples of preferable submittal materials.

Proposers are encouraged to print/copy on both sides of a single sheet of paper wherever applicable; if sheets are printed on both sides, it is considered to be two pages. Color is acceptable, but content should not be lost by black-and-white printing or copying.

All submittals will be evaluated on the completeness and quality of the content. Only Proposers providing complete information as required will be considered for evaluation. The ability to follow these instructions demonstrates attention to detail.

Additional support documents, such as sales brochures, should be included with each copy unless otherwise specified.

Section IIC - Proposal Content

1. Cover Sheet

   This form is to be used as your proposal Cover Sheet.

   See Cover Sheet - Attachment A

2. Project Team

   Identify the prime contractor and all sub-contractors that will provide the services. Describe any past experience working together, the team structure, authority, responsibility and accountability of the team.

3. Management Approach

   Describe the team leadership and oversight roles. Identify the Project Manager and provide a description of that person's qualifications and similar project experience. Describe how the contractor will make certain that schedules are met, QA/QC is maintained and disputes are resolved.

4. Respondent's Capabilities

   Proponent's capabilities must be demonstrated through resumes of assigned team members and company references for the performance of similar work. Provide a section in the proposal briefly describing five (5) most recent or ongoing MEC remediation projects that are similar in scope to this project and address the following:
   Describe the situation and objectives;
   How they were addressed, and;
   Outcome.

   Tell us about your experience working with WDOE on MTCA sites performing similar work.

   Provide current contact information for clients, partners and regulators for these projects, especially WDOE on MTCA sites.

   Attach a copy of your company's financial reports for the preceding 5 years.

5. Project Approach and Understanding

   Central Valley Floor and Associated Wetland and Step-Outs

   Based on the Clark County Reuse Plan, the CVFAW will contain most of the park improvements and will be

the primary activity area within the park. Due to the intensive uses envisioned for this 432 acre area, achieving regulatory closure of the subsurface clearance activities prescribed for the CVFAW is crucial to implementation of the Reuse Plan. Describe the technical approach proposed for the subsurface clearance of the CVFAW and the surface clearance of the step-outs. Describe the work sequence from mobilization to closeout and provide your logic for the methodology and proposed work sequence (e.g. area priority, weather considerations, safety considerations, accessibility, wetlands/riparian protection, environmental constraints, daylight hours, etc.). Provide a description of the methods to be utilized for independent quality control, site safety and explosive's handling.

Western Slopes Pilot Study

Describe the technical approach to perform the study of the Western Slopes (where the slope is 25 degrees or less). The purpose of the Pilot Study is to evaluate the selected approach described in the CAP and identify innovative alternative approaches and rough order of magnitude (ROM) implementation costs for the entire remedy. Utilizing available site data, the Contractor shall provide an approach to the Pilot Study that addresses 50 acres of the Western Slopes. The Pilot Study shall be designed to the satisfaction of Clark County, the WDOE, and the U.S. Army BRAC Division, and implemented upon approval of approach. Upon the completion of the Pilot Study, the technical results, findings, conclusions, recommendations, and cost estimates will be briefed to all parties and documented in a Technical Information Paper.

Lead-Impacted Soils

If you choose to include in your proposal services to prepare an amendment of the CAP to address the remediation of approximately 5 acres in the Pop-Up Pond Overshoot Area (directly behind RAU 2A-21) and approximately 2 acres on the range floor of the 1000" Inch range (RAU 2A-16), then describe the qualifications of individuals who would perform these services. The purpose of the CAP amendment would be to present innovative and cost effective approaches to remediate these two areas based on the newly acquired data (June 2011). If the amendment is approved by WDOE, the County and the US Army BRAC Division, the County will negotiate the cost to perform the work with the contractor at that time.

6. Proposed Cost

Provide a firm fixed price and cost detail for all services necessary to obtain a Notice of Completion for the subsurface clearance of the CVFAW including, but not limited to, mobilization, surveying, anomaly avoidance, brush clearing, subsurface clearance of the 432 acre CVFAW to 14", GIS anomaly and MEC/MD mapping, QA/QC activities, demilitarization and disposal of MEC/MD, document preparation, monthly Project Manager meetings, and quarterly advisory group meetings.

Provide a firm fixed unit cost per acre to address any step-out surface clearance requirements that may be needed.

Provide a firm fixed price for preparing the work plan for the Western Slopes Pilot Study and a firm fixed price for completing all tasks identified in Section 1B "Pilot Study Western Slopes Area" assuming the work plan is approved.

Provide a rate(s) for services to assist the County in preparing an amendment to the CAP to propose an alternative approach to the remediation of lead-impacted soils at 2 former firing ranges based on the newly acquired data (June 2011).

7. Proposed Schedule

Provide a detailed schedule for conducting all work described in your proposal.

8. Performance Guarantee

Indicate whether your proposal includes any method of guaranteeing the performance of the services such as a performance bond, letter of credit, pledge of security or guarantee by a third party.

Part III: Proposal Evaluation & Contract Award

Section IIIA - Proposal Review and Selection

1. Evaluation and Selection

   Proposals received in response to this RFP will be evaluated by a Review Committee comprised of Clark County and Army BRAC representatives.

2. Evaluation Criteria Scoring

   Each proposal received in response to the RFP will be evaluated as follows:

1.	Proposer Qualifications and Experience	40
2.	Project Approach and Performance Guarantee	30
3.	Experience with WDOE on MTCA sites	10
4.	Cost	20

   Clark County will request the highest scoring proposers come in for an interview and/or demonstration of technology.

Section IIIB - Contract Award

1. Contractor Selection

   The selection of the highest scoring proposer is expected to occur December 2, 2011.

2. Contract Development

   The proposal information and proposed prices will form the basis for negotiation of a contract. Contract negotiations will be completed following any interviews from December 6, 2011 through December 14, 2011. The County intends approve the contract by February 1, 2012.

3. Award Review

   The public may view proposal documents after contract execution. However, any proprietary information so designated by the proposer as a 'trade secret' will not be disclosed unless the Clark County Prosecuting Attorney determines that disclosure is required. At this time, proposers not awarded the contract, may seek additional clarification or debriefing, request time to review the selection procedures or discuss the scoring methods utilized by the evaluation committee.

4. Orientation/Kick-off Meeting

   Clark County intends to provide Notice to Proceed by February 1, 2012. A kick-off meeting will be scheduled by the contractor with the Project Manager at this time.

Attachment A COVER SHEET

General Information:

Legal Name of Applicant Agency_____

Street Address_____

City_____ State _____ Zip _____

Contact Person _____ Title _____

Phone _____Fax_____

Program Location (if different than above) _____

Email address _____

Tax Identification Number _____

→ Does the proposal comply with the requirements contained within the RFP?
A "No" response may disqualify the proposal from further consideration.

☐ Yes ☐ No

→ Did outside individuals or agencies assist with preparation of this proposal?

☐ Yes ☐ No *(if yes, describe.)***

Total Funds Requested Under this Proposal $ _____

I certify that to the best of my knowledge the information contained in this proposal is accurate and complete and that I have the legal authority to commit this agency to a contractual agreement. I realize the final funding for any service is based upon funding levels, and the approval of the Clark County Board of Commissioners.

_____ _____ _____
Signature Print Name and Title Date

Attachment B LETTER OF INTEREST

Legal Name of Applicant Agency_____

Street Address_____

City_____ State _____ Zip _____

Contact Person _____ Title _____

Phone _____Fax_____

Program Location (if different than above) _____

Email address _____

- All proposers are required to be included on the plan holders list. If your organization is NOT listed, submit the 'Letter of Interest" to ensure your inclusion. In the body of your email, you may request acknowledgement of receipt.

Email Attachment B to: linnea.larocque@clark.wa.gov

Clark County web link: **http://www.clark.wa.gov/general-services/purchasing/rfp.html**

This document will only be used to add a proposer to the plan holders list. Submitting this document does not commit proposer to provide services to Clark County, nor is it required to be submitted with proposal.

Proposals may be considered non-responsive if the proposer is not listed on the plan holders list.

CORRECTIONS TO SPECIFICATIONS
ADDENDUM 1

CLARK COUNTY

TO: Holders of Specifications Relating to:
RFP: # 614 – Remedial Action for Camp Bonneville Military Reservation

DATE: October 25, 2011
FROM: Mike Westerman, CPPO
FOR:

SUBJECT: Corrections to Specifications

ADDENDUM #1

Please note the following changes to specifications for RFP # 614. The following changes, additions and/or deletions to the RFP hereby become a part of the contract documents.

Acknowledge receipt by signing where indicated on Attachment A: Cover Sheet.

CHANGE: **PROPOSAL DUE DATE**
FROM: November 9, 2011 at 4:30 p.m.
TO: November 28, 2011 at 4:30 p.m.

REPLACE: Project Schedule, Page 6, Section IA 4. Timelines for Selection
WITH: new intended timeline attached.

REPLACE: Project Approach and Understanding, Page 18, Section IIC 5. Approach and Understanding.
WITH: new paragraph attached

REPLACE: Attachment A COVER SHEET
WITH: new Attachment A COVER SHEET labeled **Addendum #1.**

Project Schedule

Page 6, Section IA 4. Timeline for Selection

New intended timeline:

Pre-submittal Meeting	November 2nd 2011 (see Part II, Section IIA)
Proposals due	November 28th, 2011
Proposal review/evaluation period	November 29th - December 16th 2011
Selection committee recommendation	December 16th 2011
Contract negotiation	January 3rd – January 31st 2012
Contract completion/intended to begin	February 2012

Page 16, Section IIA 2. Proposal Clarification
The deadline for submitting such questions/clarifications via e-mail is 5 p.m. November 16, 2011. An addendum will be issued no later than 12:00 p.m. (noon) November 18, 2011, to all recorded holders of the RFP if a substantive clarification is in order.

Page 19, Section IIIB 1. Contractor Selection
The selection of the successful proposer is expected to occur December 16, 2011.

Page 19, Section IIIB 2. Contract Development
The proposal information and proposed prices will form the basis for negotiation of a contract. Contract negotiations will be completed following any interviews from January 3, 2012 through January 31, 2012. The County intends approve the contract in February 2012.

Project Approach and Understanding

Page 18, Section IIC 5. Project Approach and Understanding

Replace paragraph:

> Lead-Impacted Soils
> If you choose to include in your proposal services to prepare an amendment of the CAP to address the remediation of approximately 5 acres in the Pop-Up Pond Overshoot Area (directly behind RAU 2A-21) and approximately 2 acres on the range floor of the 1000" Inch range (RAU 2A-16), then describe the qualifications of individuals who would perform these services. The purpose of the CAP amendment would be to present innovative and cost effective approaches to remediate these two areas based on the newly acquired data (June 2011). If the amendment is approved by WDOE, the County and the US Army BRAC Division, the County will negotiate the cost to perform the work with the contractor at that time.

With:

> Lead Impacted Soils. Provide consulting services to assist the county in the preparation of an amendment to the CAP to propose an alternative approach to the remediation of lead-impacted soils at 2 former firing ranges based on the newly acquired data (June 2011). The 2 ranges to be remediated include approximately 5 acres in the Pop-Up Pond Overshoot Area (directly behind RAU 2A-21) and approximately 2 acres on the range floor of the 1000" Inch range (RAU 2A-16). If the amendment is approved by WDOE, the contractor and the County will negotiate a price for executing the remediation and preparing the After Action Report (AAR) for the entire RAU 2A. Provide a rate or rates for the provision of this service.

Attachment A COVER SHEET

General Information:

Legal Name of Applicant Agency_____

Street Address_____

City_____ State _____ Zip _____

Contact Person _____ Title _____

Phone _____ Fax_____

Program Location (if different than above) _____

Email address _____

Tax Identification Number _____

ADDENDUM:

Proposer shall insert number of each Addendum received. If no addendum received, please mark **"NONE".**

No. _____ Dated: _____ No. _____ Dated: _____ No. _____ Dated: _____.

NOTE: Failure to acknowledge receipt of Addendum may render the proposal non-responsive.

→ Does the proposal comply with the requirements contained within the RFP?
A "No" response may disqualify the proposal from further consideration.

☐ Yes ☐ No

→ Did outside individuals or agencies assist with preparation of this proposal?

☐ Yes ☐ No *(if yes, describe.)***

Total Funds Requested Under this Proposal $ _____

I certify that to the best of my knowledge the information contained in this proposal is accurate and complete and that I have the legal authority to commit this agency to a contractual agreement. I realize the final funding for any service is based upon funding levels, and the approval of the Clark County Board of Commissioners.

_____ _____ _____
Signature Print Name and Title Date

CORRECTIONS TO SPECIFICATIONS
ADDENDUM 2

CLARK COUNTY

TO: Holders of Specifications Relating to:
RFP: # 614 – Remedial Action for Camp Bonneville Military Reservation

DATE: November 14, 2011
FROM: Mike Westerman, CPPO

SUBJECT: Corrections to Specifications

ADDENDUM #2

Please note the following changes to specifications for RFP # 614. The following changes, additions and/or deletions to the RFP hereby become a part of the contract documents.

Acknowledge receipt by signing where indicated on Attachment A: Cover Sheet.

Question 14) In the Section titled County Performed Work reference is made to EP 385-1-95b. This reference has been superseded by EM 385-1-97. Should EM 385-1-97 replace reference to EP 385-1-95b?
Answer 14) Yes, DOD publications are constantly updated. Use the current publications for this project.

Question 26) The RFP stated the 105mm HE artillery round is the MGFD is this correct?
Answer 26) No, paragraph 1, page 6 should read; "Based on the results of the previous surface clearance, the Munition with the Greatest Fragmentation Distance (MGFD) for the CVFAW is considered to be the 75mm HE artillery projectile".
An unfired 105mm HE projectile was found in its shipping configuration on the road leading from the magazines. According to USATCES, we may consider this a single event item.

Question 44) Our slope analysis indicates the entire western slope area as defined in Slide 12 of the site visit presentation is less than 25% slope. The slide indicates only part of the western slope is less than 25% slope. Are we responsible for all areas within the western slope area that is less than 25% or just the area indicated in slide 10 of the site visit presentation?
Answer 44) This was a typographical error in the Department of Ecology CAP (Slide 12 Map). The correct slope is 25 degrees.

ADDITIONAL INFORMATION/CLARIFICATIONS TO SPECIFICATIONS

Last Updated: November 10, 2011

CLARK COUNTY

TO: Holders of Specifications Relating to:
RFP: # 614 – Remedial Action for Camp Bonneville Military Reservation

RELEASE DATE: October 19, 2011
FROM: Mike Westerman, CPPO

SUBJECT: Additional Information/Clarifications to Specifications

Question 1) Is there a limit of how many people we can have attend the site visit on November 2nd?
Answer 1) The maximum number of people is two per proposer.
To reserve a spot please **RSVP** to Jerry.barnett@clark.wa.gov

Question 2) What will the proposer be able to do on the site visit? I.E. Can we walk the site with our magnetometers? Or is this strictly a windshield tour?
Question 3) Since the site has over 400 acres would Clark County consider extending the site visit to two days to cover more ground?
Answer 2 &3 This will be a (windshield/walking) tour, the Central valley floor is flat with moderate vegetation and good road access from all sides it will take less than 4 hours to provide prospective contractors with a complete and thorough tour.

Additionally the contractor data package contains numerous anomaly density maps, geophysical data and previous MEC/MD finding reports etc. Contractors should consider the entire Central Valley Floor as; Level to Mild slope, Moderate vegetation and a heavy subsurface MEC density from (37mm to 75mm). One 105mm projectile was found in the CVF but it was unfired and in its shipping configuration alongside the storage magazine access road.

This is a subsurface clearance to 14 inches below ground surface of 432 acres; the selected contractor will not be liable for anomaly's deeper than 14 inches under this contract.

Question 4) Of the 30 points associated with Evaluation Factor #2, what is the maximum points a proposer can score without providing a financial Performance Guarantee instrument to Clark County?
Answer 4) Evaluation Criteria Factor 2, "Project Approach and Performance Guarantee", does not allocate a specific number of points for the performance guarantee separate and apart from the project approach. Under criteria 2, proposals will be evaluated based on the merit of the project approach including whether it provides any guarantee for the contractor's performance. This guarantee could consist of a performance bond, a letter of credit, a surety bond, payment retention or any other mechanism.

Question 5) What time does the Pre-submittal meeting start?
Answer 5) 8:30 AM

Question 6) Task 1: The RFP requires that both an Explosive Safety Submission (ESS) and Explosive Siting Plan (ESP) be developed by the contractor. It is our experience that ESPs are utilized primarily on investigation projects that do not have an ESS requirement. Will you consider deleting the requirement to produce an ESP?
Answer 6) The ESP is a relic from previous characterization efforts and is optional if the contractor wanted to use it. The ESS is a DDESB requirement to complete all the MEC remediation's at Camp Bonneville only because DOD funding is being utilized. Clark County has started an ESS for the CVF but has not completed it since we are not yet sure what methodologies the selected contractor will use for the removal action. Clark county will assist in its finalization if the contractor chooses to use it vs. developing their own.

Question 7) Task 3 – Please expand on your description of the site facilities that will be available for contractor use. Specifically:

Question 7.1. **What specifically are the facilities and information (size, SQ footage, number of rooms, etc)?**

Answer 7.1) There are 2-(20 x 70 ft) heated buildings available; 1st One has 2 rooms that are approximately (35 x 20f ft) each i.e. Office/ meeting room the other is fully open (20 x 70 ft) crew equipment storage/Break room. There is electricity, lights, 5 telephone lines and internet
There is no potable water or toilet facilities associated with these buildings and those must be provided by the contractor.

Question 7.2 **What are the rental rates of each facility?**

Answer 7.2) There will be no cost to the contractor associated with these buildings for rent, utilities, internet or phones. If the contactor requires any additional temporary office/equipment storage space that will need to be paid for by the contractor. There is a generous outdoor parking-Heavy equipment storage area adjacent to these spaces

Question 7.3 How are utilities handled – contracted with providers directly or rented through Clark County?

Answer 7.3 These costs will be paid by Clark county for the duration of the project.

Question 7.4 If provided by Clark County, what are the utility rates so they can be accounted for in the bid?

Answer 7.4 N/A

Question 8) Task 5 – The RFP calls for a geophysical test plot to demonstrate the contractor's ability to adequately perform anomaly reacquire. The industry has moved to the Geophysical Systems Verification methodology which utilizes a small Instrument Verification Strip with associated blind seeding of the production area to demonstrate that the entire Digital Geophysical Mapping system (equipment, personnel, etc.) meets the project objectives for all aspects of the geophysical investigation not just the anomaly reacquire task. (ITRC Reference). Does Clark County have a preference?

Answer 8) No, Clark County does not have a preference and is aware of the industry standard (GSVM) however there are numerous geophysical prove out grids/test plots available on site with inert ordnance at various depths orientations etc. These grids and the data would be available to the selected contractor if they would like to utilize them for their own QA/QC both analog or digital. Keep in mind that there will be additional independent QA/QC conducted by WDOE, and Clark county staff during the project.

Question 9) Task 6: Does Clark County desire the site be sanitized of all anomalies or just the removal of potential MEC anomalies?

Answer 9) For DGM (Digital); Only MEC anomalies, based on MV values selected by the ASB and the contractors QA/QC manager and/or senior geophysicist..
For mag and dig (analog); All non MEC scrap metal collected during the removal must be stored and properly disposed of by the end of each phase.

Question 10) Task 6: In the paragraph labeled Range Debris, should the phrase "non-MEC" in the last line of the paragraph read "range debris".

Answer 10) Yes consider them interchangeable

Question 11) Task 6: The RFP indicates that "a fenced storage magazine area for project demolition materials is available on site." What are the specifications of the magazine?

Answer 11) It is a fenced area where several of the previous contractors kept (2) BATF approved storage magazines, the fence is in good repair and some grounding rods are still in the ground but the magazines were removed by the previous contractors. The contractor will be required to provide their own magazines and have them properly installed and inspected to meet all federal and State requirements.

Question 12) Task 8: If an intrusive investigation fails, what is the required re-work? Just the failed investigation, a select area around the failure or some other requirement?

Answer 12) Since this will be a Clark County Regional Park with heavy human interaction we will expect the contractor to perform at the highest professional standards. If a prospective contractor feels any of the following are unrealistic expectations please do not bid on this proposal:
One MEC/MD item missed will fail the entire grid and it must be redone at the contractors cost, a continued pattern of such failures initially will cause a safety/QC stand down to determine the reason for the failures and develop corrective actions. Continued failures after these corrective actions may be grounds for contractor dismissal, or withholding of payments.
Failure criteria for non MEC/MD items will be negotiated with WDOE, Clark County and the contractor after award but will be based on industry standards for number and dimensions. The previous criteria was (5) - (>2 square inch) metal pieces per grid.

Question 13) Will you furnish the GIS data files produced in earlier studies for purposes of proposal development?

Answer 13) Yes Clark County will post it on the contractor data package ASAP.

Question 14) In the Section titled County Performed Work reference is made to EP 385-1-95b. This reference has been superseded by EM 385-1-97. Should EM 385-1-97 replace reference to EP 385-1-95b?

Answer 14) Yes, As DOD publications are being constantly updated please utilize the current publications for this project.

Question 15) What is the minimum size metallic debris required for removal in the step out grids?

Answer 15) Failure criteria for non MEC/MD items will be negotiated with WDOE, Clark County and the contractor after award but will be based on industry standards for number and dimensions. The previous criteria was 5- (>2 square inch) metal pieces. Following WDOE protocol for step-out grids, any step-outs in the CVF will be surface clearance only.

Question 16) Was all metal debris removed from the clearance areas or just munitions and range related?

Answer 16) The previous clearance was never completed however most of the scrap metal on the surface was collected and disposed of. There was not an exorbitant amount of non MEC scrap found on the surface.

Question 17) The scope states that the MGFD is the 105mm projectile. The records show there was a 155mm found. Is the 155mm being considered an anomalous find and therefore should not be considered as the MGFD?

Answer 17) The Central Valley floor is a separate MRS, the 155mm was found in the Central Impact Target Area. The 105mm was found unfired in its shipping configuration next to the storage magazines access road and is considered a single event item.

Question 18) Our understanding of the request to provide costs for services related to assisting Clark County in amending the CAP to propose an alternative approach to the remediation of lead-impacted soils is that the responders are to indicate the hourly rates of contractor personnel that are proposed for this task. Is this assumption correct?

Answer 18) Yes.

Question 19 The RFP indicates that contract negotiations will take place after selection. What contract vehicle (terms and conditions) will the County expect to be using? Is there a template contract for review by the respondents at this time?

Answer 19 The contract will be negotiated after selection. If Clark County can't agree to terms with the selected proposer, we will begin negotiations with the runner-up. We do not have a template for this contract available for review.

Question 20 Was an Environmental Protection Plan prepared by the previous contractors? If so, can the county provide this document?

Answer 20 No, DID MR-005-12 ; The EPP shall be a site specific plan that describes the contractor's procedures and methods during site activities to minimize pollution, protect and conserve natural resources, restore damage, and control noise and dust within reasonable limits.

Under MTCA, this was not a requirement since every action requires a (State Environmental Protection Act) SEPA checklist this checklist addressing the environmental impacts associated with this cleanup.

Question 21 Can the county please provide the June 2011 data for the lead-impacted soils at the two ranges referenced in the RFP?

Answer 21 Yes, we will put it on the FTP site ASAP.

Question 22 Three folders on the ftp site are empty. Should the following folders contain data?

A. Contractor Data Package\Aerial Photos

Answer A There are photos currently being added to the file.

B. Contactor Data Package\CBDATA\Project Controls\Central Valley\Trimble Shape file import

Answer B see #23

C. Contactor Data Package\Central Valley\Trimble shape file import

Answer C see #23

Question 23 Can the county provide the GIS shape files that are linked to within the .mxd project files that were provided?

Answer 23 22 B, C and 23; Many of the files from the previous investigations were in folders that were labeled as what we thought (by name) would be pertinent data to the contractors bidding on this proposal. Some of these folders were empty. We are confident that the data package provided to the contractors was adequate to complete the proposal. If a file or folder is empty please disregard it, all data available was posted on the contractor data package ftp site.

We recently added by request the GIS data from the previous contractors; it is on the Contractor data package ftp site under “GIS data”

Question 24 Has WDOE accepted the grids that are denoted as “complete” in the files provided to the contractors?

Answer 24 No, the Cleanup Action Plan supersedes all previous clearance work since the CVF is now sub-surface. The “complete” being referred to was internal from the previous contractor. WDOE will not sign off until the CVF has been cleared to 14’’ BGS as per their CAP.

Question 25 The RFP states that step-out grids may only be requested or required for surface clearance activities. Does this mean that step-outs with subsurface clearance to 14-inches below ground surface are not requested or required?

Answer 25 The requirement for a step out in any of the MEC clearance areas at Camp Bonneville is written into the CAP as follows please pay particular attention to #3 we underlined and bolded it;

4.9.1 Standard Step-out Procedure

Step-out clearance is employed to insure that isolated discoveries of MEC are not evidence of additional areas of concern. Step-Out clearance procedures will be done in accordance with the following steps:

1. If a MEC or MD item, of a particular (hazardous) military munition, is found within a boundary grid of a designated clearance area, then the clearance area shall be expanded by adding a new (100 ft. x 100 ft.) grid adjacent to the grid of concern.
2. The new grid will be brush cleared.
3. The new grid will be **surface cleared** and if a MEC or MD item of a hazardous military munitions is discovered, the procedure will repeat until no MEC or MD are found

Question 26 The RFP stated the 105mm HE artillery round is the MGFD is this correct?

Answer 26 No, paragraph 1, page 6 was a mistake on our part it should read; "Based on the results of the previous surface clearance, the Munition with the Greatest Fragmentation Distance (MGFD) for the CVFAW is considered to be the 75mm HE artillery projectile".

An unfired 105mm HE projectile was found in its shipping configuration on the road leading from the magazines, after discussions with USATCES we may consider this a single event item.

Question 27 Is DGM required for the subsurface clearance of the Central valley floor clearance?

Answer 27 No, DGM (Digital) or Mag and Dig (Analog) or any combination of the Two are acceptable techniques provided they pass the QA/QC checks and meet the clearance requirements.

Question 28 Is the Labor and Industries contact in the RFP still correct?

Answer 28 No, Evidently the contact person handling Camp Bonneville has recently changed to; (Russell Haus (360) 902-4902).

Question 29 Who is responsible for any non-ordnance related hazwaste that may be located during intrusive activities?

Answer 29 This is a firm fixed price contract for MEC removal and or optional lead work only, the contractor will only be responsible for UXO/MEC/MD/ and any non MEC scrap that is excavated in their approach. If any "non-ordnance related hazwaste" is discovered Clark county will petition the Army for the funding to remediate the hazwaste, and then negotiate the remediation with WDOE and the PLP for remediation.

Question 30 The General Terms and Conditions: Section Cost of Proposal and Award – item (b) references "special terms and conditions". We cannot find in the RFP any additional terms and conditions

Answer 30 The RFP is a Clark county boilerplate document some of our RFP's may have "special terms and conditions" this one does not.

Question 31 Section IB,Task 5 geophysical target reacquisition infers flagging previously identified anomalies, but there is no task for geophysical mapping. Are we expected to use previously collected DGM data for reacquire and anomaly removal? Will we be held responsible and liable for the quality of our work, if we are required to use this previous data?

Answer 31 (1) As previously stated the past contractors DGM approach was a beta test to allow them to utilize DGM in an experimental surface clearance configuration to minimize the cost of having to clear brush to the level they had originally agreed to (this approach did not work). This data should therefore not be utilized for anything other than general site information. Therefore the contractor will not be "expected to use previously collected data" and will only be held responsible for the quality of their own work.

2) Clark county is requesting an experienced MEC contractor to submit a proposal to clear 432 acres of the CVF/AW to 14'' BGS, we are relying on the contractor to present us with an innovative approach to do this that will make the future park safe for citizens to use. Clark county has previously stated DGM and/or mag and dig or are both acceptable approaches provided they accomplish the objective. The flagging under target reacquisition refers to the anomalies that the prospective contractor will have "previously" identified during the collection phase of a DGM investigation (if used). The contractor's approach will be evaluated whether or not they utilize mapping. We would however suggest using mapping with DGM so the ASB can review the data and select the anomalies to prosecute based on their selected signatures.

Question 32 Are we expected to DGM/remove MEC/MPPEH in unsurveyed/remaining areas within the CVF? If so under what task? Task 2 is for location, surveying, mapping (not geophysical), and GIS plan, Task 2 does not reference DGM. Additionally, Task 2 refers to DID MR 005-07 Geospatial Information and electronic submittals, it does not address DGM; however, DID MR 005-05 does addresses DGM.

Answer 32 Again there are no "surveyed" areas in the CVF under this proposal, Clark county is requesting an experienced MEC contractor to submit a proposal to clear 432 acres of the CVF/AW to 14'' BGS, we are relying on the contractor to present us with an innovative approach to do this that will make the future park safe for citizens to use. Clark county has previously stated DGM and/or mag and dig or are both acceptable approaches provided they accomplish the objective.

Question 33 Section IB, Task 8 Project Quality Control, verbiage (e.g. anomaly reacquisition, anomaly review board, strongly suggests DGM. Does this mean mag and dig/analog geo physics is unacceptable in areas previously not geophysically surveyed?

Question 33 Again there are no "surveyed" areas in the CVF under this proposal, Clark county is requesting an experienced MEC contractor to submit a proposal to clear 432 acres of the CVF/AW to 14'' BGS, we are relying on the contractor to present us with an innovative approach to do this that will make the future park safe for citizens to use. Clark county has previously stated DGM and/or mag and dig or are both acceptable approaches provided they accomplish the objective.

Question 34 Is there information available for the intrusive work done outside the rocket range in the CVF? We have reacquire sheets for the numerous grids and subgrids outside of the rocket range, but no dig sheets.

Answer 34 Please refer to the ASB folder and after action reports folder in the contractor data package on the ftp site for any data pertaining to the clearance of the rocket range. None of the 432 acres of the CVF has been intrusively investigated with the exception of the rocket range which is mainly outside of the CVF.

Question 35 Is there a comprehensive map available showing how the MEC and MD were distributed?

Answer 35 Please refer to the folder ASB (Anomaly Selection Board) on the FTP site. These folders contain the MEC/MD findings in map form showing the grids, please keep in mind these are surface findings only since the subsurface survey work has not been done. Additionally the FTP site contains a map of analog sub-surface anomaly counts for large percent of the CVF, some geophysical maps from other studies i.e. drum burial survey, ACOE, TCRA for TA8 & TA9 etc were provided as general site information only.

Question 36 Are there any special interests/issues with specific stakeholders that need special attention in our community relations plan?

Answer 36 No, a "community relations plan" was not requested or required for this contract. The only public involvement Clark County may require is for the contractor to be present to answer specific (MEC or equipment type) questions at Camp Bonneville Advisory Group meetings. Clark County and WDOE are responsible for all community relations for this project and have already staffed and contracted for this accordingly.

Question 37 Section IA, Item 2, Background (page 6), states that the RI/FS report is available in Appendix A of the RAU3 CAP. There are some hazard analysis summary tables in Appendix A, however, the **RI/FS report is not included. Can we get a copy of the RI/FS report?**

Answer 37 The CAP and RIFS are WDOE documents we will post the RIFS on the FTP site under (WDOE CAP folder) ASAP, additionally here is the link to the WDOE website for future reference to their documents; https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=11670

Question 38 What about areas within the wetlands that exceed 14" in water depth? You mentioned that our box did not exceed 14" unless directed by the ASB. Is the 14" from the surface of the water or 14" from the bottom of the water covered areas?

Answer 38 No subsurface clearance of any of CVF water feature's is required, the wetlands remediation protocol is to complete the clearance in mid August/September timeframe when the water levels are at their lowest point.

Question 39 Is the contractor expected to do stream or wetland restoration after intrusive investigation of anomalies in these areas?

Answer 39 Yes, filling in dig holes, raking and reseeding with wetlands grass mixture is required, since only light machinery and manual vegetation removal (light footprint) is required "wetland restoration" should be negligible.

Question 40 Section 1B, Task 8 states "all intrusive QC failures shall require 100% reinvestigation." Please define a QC failure (e.g., MEC found <14 inches?).

Answer 41 Any UXO/MEC item found between 0 and 14'' BGS in a grid during a QA/QC process will require the entire grid to be redone at contractor's expense.

Question 42 Section 1B, Task 8 states “all intrusive QC failures shall require 100% reinvestigation.” Please define 100% reinvestigation (e.g., resurvey failed grid? recheck all anomalies in failed grid?)

Answer 42 Resurvey failed grid at contractors’ expense. (See other contractor questions on the Q&A site postings)

Question 43 In reviewing the GIS data provided on the FTP site we have calculated the area within the boundary of RAU 3 (central Valley Floor) to measure out at 482 acres. During the site visit, it was identified that previously cleared areas within the valley floor will require re-clearing. Can the County please identify whether there are any areas within the valley floor and within the RAU3 boundary (other than the sewage lagoons) that will not to be cleared. Or is the actual area of the valley floor 482 acres rather than the current estimate of 432.

Answer 43 The data provided to us by the previous contractor had some questionable representations, during our negotiations with the Army we had a (approximately) 30 acre difference in what they believe the acreage is in their (IGE) and what Clark County approximated in their estimate. We agreed on 432 acres as an approximation. However, as we have previously stated, the contractor is only responsible for 432 acres and 14’’ BGS if during the cleanup they exceed 432 acres or an increase in depth Clark County will petition the Army for the funding to complete the removal.

Additionally other than the sewage ponds there are approximately 5 acres covered by the pop up pond, 8 to 12 acres covered by Lacamas creek several firing range berms and gravel roads.

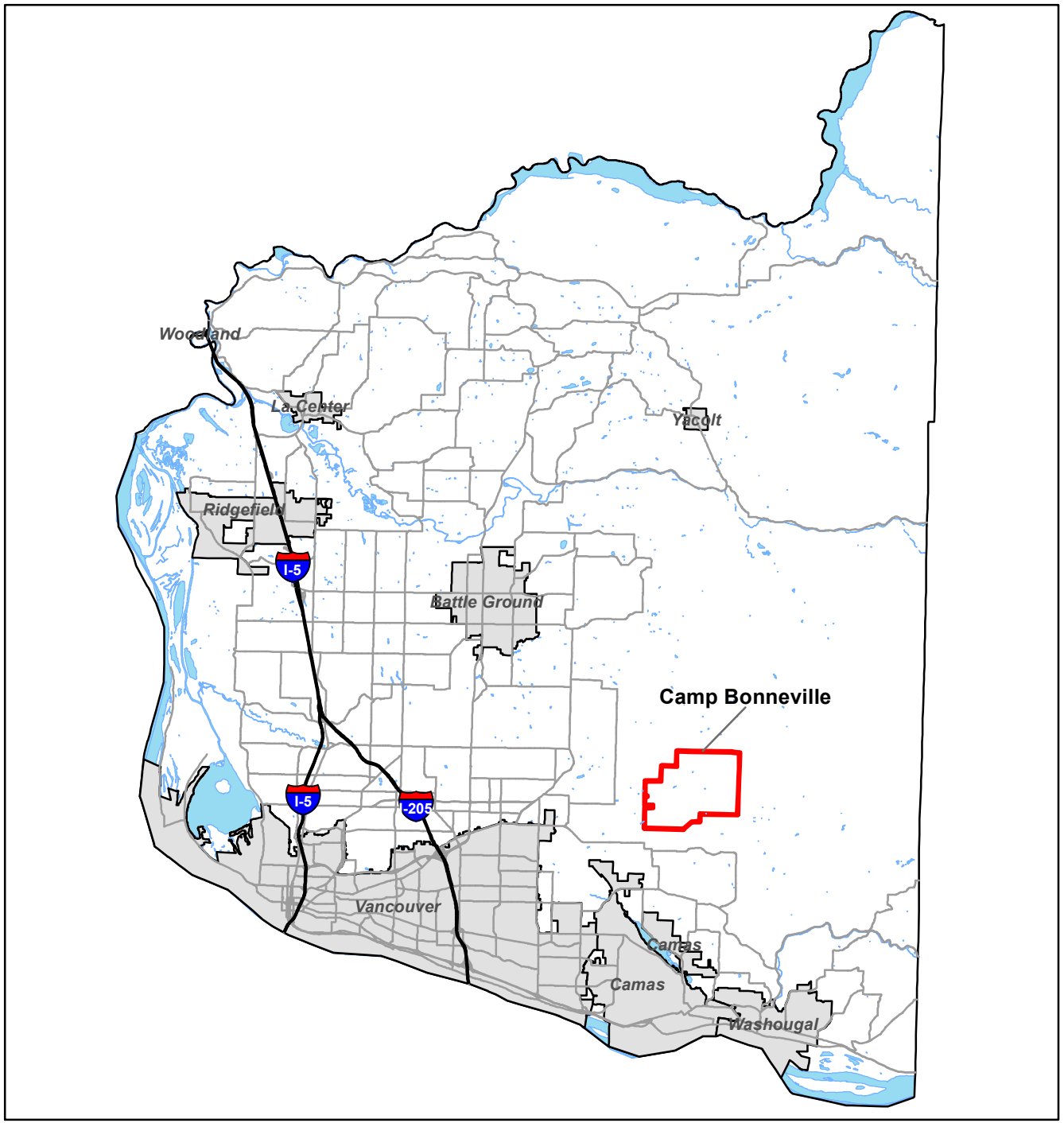
Question 44 Our slope analysis indicates the entire western slope area as defined in Slide 12 of the site visit presentation is less than 25% slope. The slide indicates only part of the western slope is less than 25% slope. Are we responsible for all areas within the western slope area that is less than 25% or just the area indicated in slide 10 of the site visit presentation?

Answer 44 This was an typographical error in the WDOE CAP (Slide 12 Map), please use 25 degrees instead of 25% in calculating the areas for the 50 acre surface clearance pilot study.

Question 45 The RFP discussion on Task 2 indicates that we should use DID MR-005-07 and DID MR-005-14 for guidance. The DIDs have been updated since these were released. Would the County prefer we use the more current DIDs?

Answer 46 Yes, As DOD publications are being constantly updated please always utilize the current publications for this project.

APPENDIX B
SITE MAPS



N

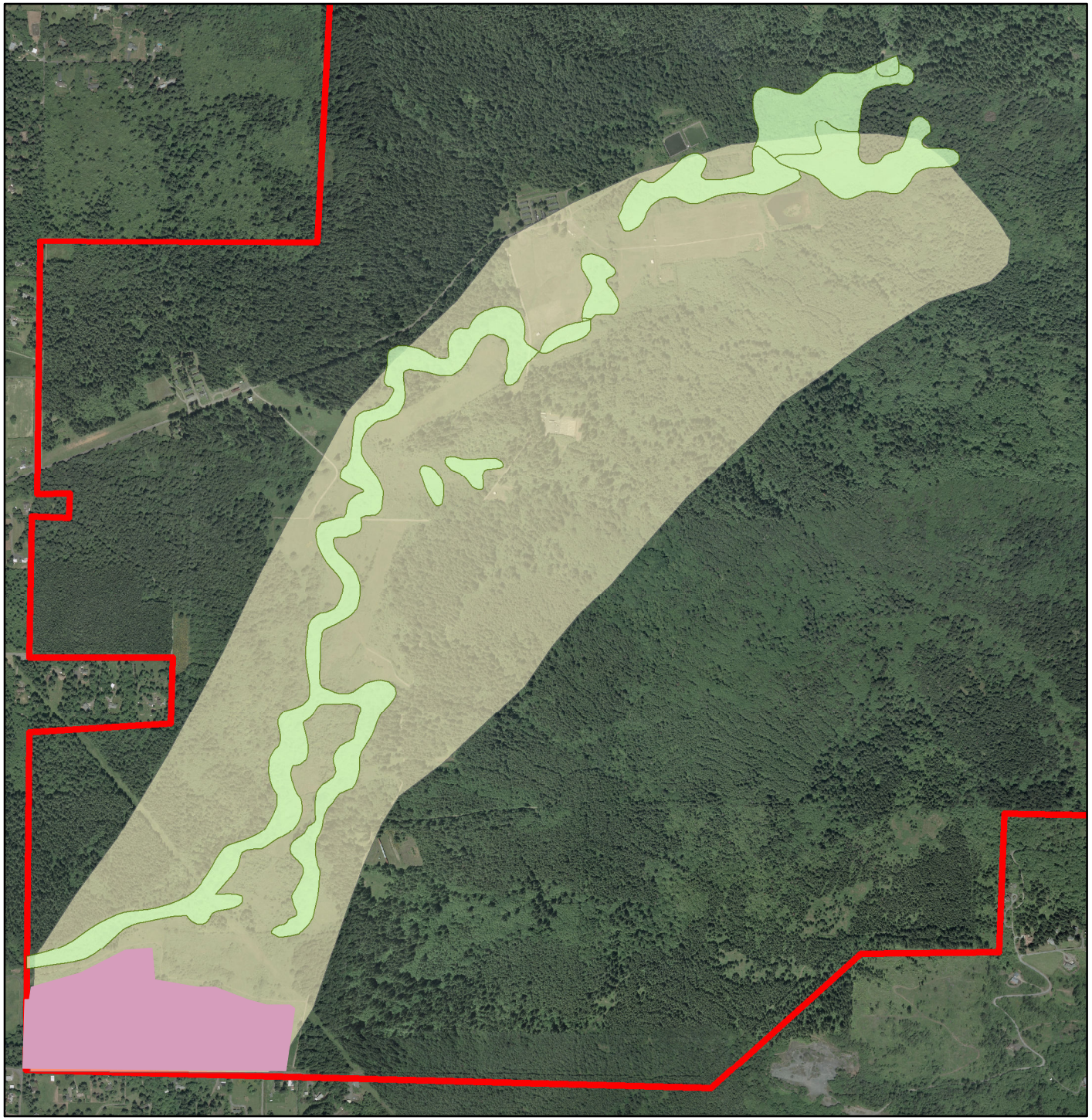
0 2.5 5 10 Miles

Clark County Public Works

FIGURE 1
FORMER CAMP BONNEVILLE
MILITARY RESERVATION LOCATION

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



LEGEND

- Environmental Study Area
- Wetland Area
- Central Valley Floor
- Camp Boundary

N

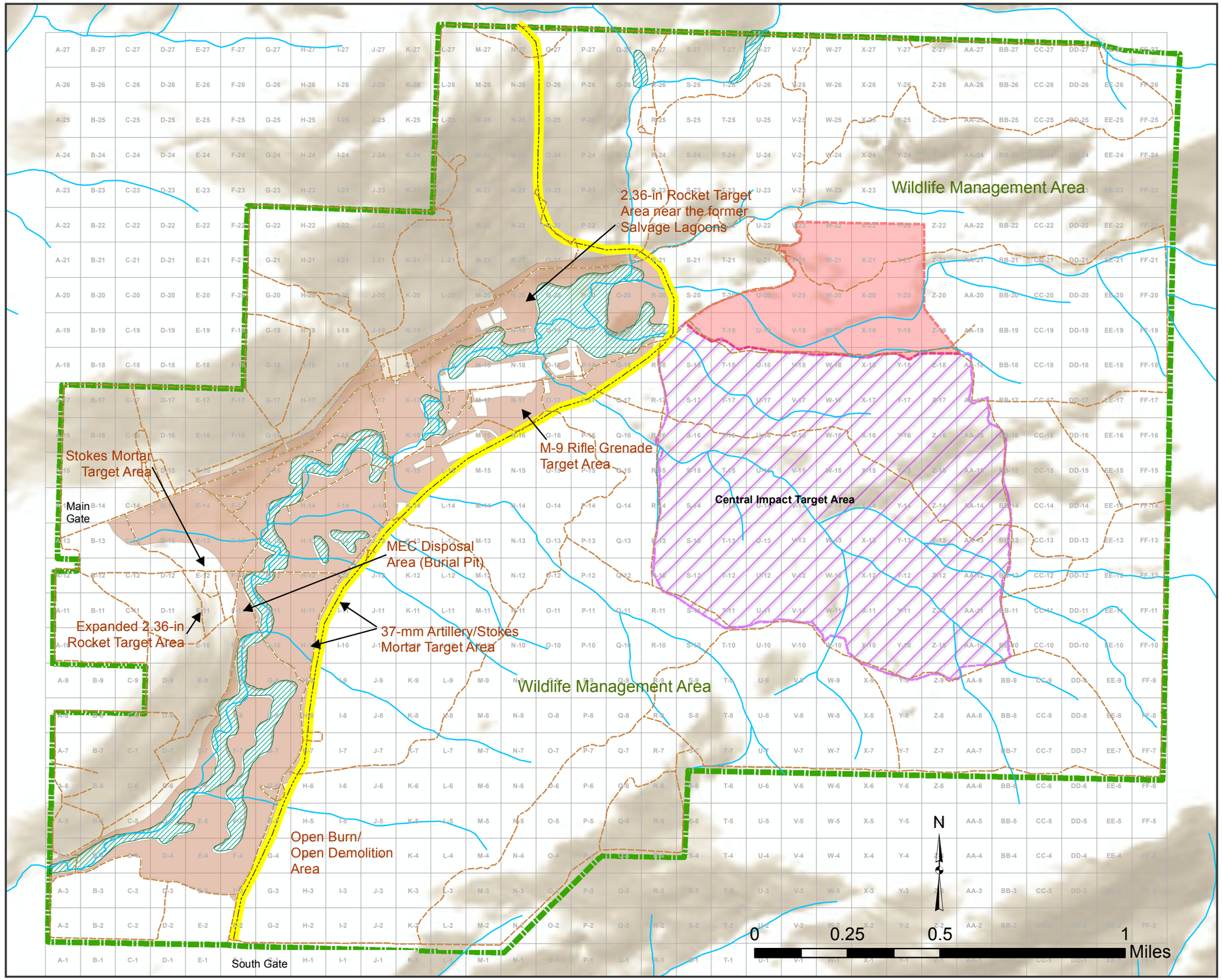
0 500 1,000 2,000
Feet

Clark County Public Works

FIGURE 2
REMEDIAL ACTION UNIT 3
AND THE CENTRAL VALLEY FLOOR
AND ASSOCIATED WETLANDS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



LEGEND

- Property Boundary
- Central Valley Perimeter Survey
- Central Impact Target Area
- Central Impact Target Area Expansion
- Wetlands
- Park Boundary
- Streams / Rivers
- Roads

Clark County Public Works

FIGURE 3
CVFAW, TARGET AREAS, AND DISPOSAL AREAS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

APPENDIX C
POINTS OF CONTACT

Appendix C
Points of Contact

Title	Name	Telephone Number
Clark County PM	Jerry Barnett, PE	(o) 360-566-6992
Clark County Munitions Safety Advisor	Greg Johnson, Master EOD	(o) 360-566-6993 (c) 360-229-0529
WESTON SUXOS	Bruce Moe	(c) 831-240-1386
WESTON UXO Safety Officer	Randal Schneider	(c) 360-949-0225
WESTON UXOQCS	Mike Everman	(c) 360-929-5724
WESTON PM	George Overby	(o) 864-399-9902 (c) 864-320-3409
WESTON MEC Program Quality Manager	Al Larkins	(o) 410-696-7260 (c) 443-280-7049
WESTON MEC Operations Manager	Tony Clark	(c) 831-998-1616
Local Authorities, as directed	Department of Emergency Services	911
Bureau of Alcohol, Tobacco, Firearms and Explosives	--	800-461-8841

APPENDIX D
ACCIDENT PREVENTION PLAN

ACCIDENT PREVENTION PLAN
MUNITIONS AND EXPLOSIVES OF CONCERN
REMOVAL ACTION
REMEDIAL ACTION UNIT 3
CENTRAL VALLEY FLOOR AND ASSOCIATED WETLANDS

Former Camp Bonneville Military Reservation
Vancouver, Washington

Prepared by:

Michael Stuart
Project Health and Safety Officer

Date: July 12, 2012

Approved by:

Lisa Marie Kay
Executive Sponsor

Date: July 12, 2012

Reviewed by:

George Crawford, CIH
Corporate Environmental, Health, and Safety Manager

Date: July 12, 2012

Randal Schneider
Site Safety and Health Officer UXO Safety Officer

Date: July 12, 2012

George Overby, CHMM
Project Manager

Date: July 12, 2012

Remediation Agreement
Between Clark County, Washington and Weston Solutions, Inc.
DCN B0001

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ABBREVIATIONS AND ACRONYMS

AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
BBS	behavior-based safety
bgs	below ground surface
CAP	Cleanup Action Plan
CBMR	Camp Bonneville Military Reservation
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
CVFAW	Central Valley Floor and Associated Wetlands
DDESB	Department of Defense Explosives Safety Board
DOT	Department of Transportation
DGM	Digital Geophysical Mapping
EHS	Environmental Health and Safety
EM	Engineering Manual
EMR	experience modification rate
EPA	United States. Environmental Protection Agency
HAZCOM	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HE	high explosive
IATA	International Air Transport Association
KO	Contracting Officer
MD	munitions debris
MEC	munitions and explosives of concern
MGFD	munition with the greatest fragmentation distance
Mm	millimeter
MMRP	Military Munitions Response Program
MPPEH	munitions potentially presenting and explosive hazard
OHP	Occupational Health Program
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PPE	personal protective equipment
RAU	Remedial Action Unit

ABBREVIATIONS AND ACRONYMS (Continued)

QC	quality control
SOH	safety and occupational health
SSHP	Site Safety and Health Plan
SUXOS	Senior Unexploded Ordnance Supervisor
TP	Technical Paper
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
UXOQCS	Unexploded Ordnance Quality Control Supervisor
UXOSO	Unexploded Ordnance Safety Officer
WDOE	Washington Department of Ecology
WESTON	Weston Solutions, Inc.

1. BACKGROUND INFORMATION

Contractor Name: Weston Solutions, Inc. (WESTON)
Contract Number: Remediation Agreement No. 614
Project Name: Remedial Action Unit (RAU) 3 Munitions and Explosives of Concern (MEC) Removal Action, Former Camp Bonneville Military Reservation, Vancouver, Washington

1.1 INTRODUCTION

This Accident Prevention Plan (APP) presents the minimum requirements for safety and health that must be met by personnel engaged in clearance operations at RAU-3 of Former Camp Bonneville Military Reservation (CBMR). This APP does not in any way relieve site personnel, contractors, or subcontractors from responsibility for the safety and health of their personnel. Contractors are required to review project site conditions and the work to be performed and determine specific safety and health requirements for their personnel. Visitors to the site will receive a safety briefing by the unexploded ordnance safety officer (UXOSO) prior to gaining entry to the work area. The Senior UXO Supervisor (SUXOS)/Site Manager will provide all visitors appropriate personal protective equipment (PPE) and an escort while on-site and maintain an on-site visitor log.

The APP is the interface with WESTON's Corporate Environmental Health and Safety (EHS) manual and is prepared to be consistent with all applicable Army, federal, state, and local health and safety requirements, which include the following:

- 29 Code of Federal Regulations (CFR) 1904, 1910, and 1926 (Occupational Safety and Health Administration [OSHA] General Industry and Construction Standards, respectively).
- U.S. Environmental Protection Agency (EPA) Standard Operating Safety Guides, Office of Solid Waste and Emergency Response, June 1992.
- Resource Conservation and Recovery Act of 1976 Transport/Disposal.
- 49 CFR – Department of Transportation (DOT) Commercial Drivers License and Shipping.

- Engineering Manual (EM) 385-1-1 U.S. Army Corps of Engineers (USACE) Health and Safety Requirements Manual, 15 September 2008.
- EM 385-1-97 Explosives Safety and Health Manual.
- Federal Acquisition Regulations 52.236-13.
- Unified Facilities Guide Specifications, 01 35 26, Safety and Occupational Health requirements.

1.2 PROJECT AND WORK DESCRIPTION

WESTON has been contracted by the Clark County Department of Public Works to support the Cleanup Action Plan (CAP) effort at the CBMR. The work included under this effort involves conducting a clearance of suspected munitions and explosives of concern (MEC), munitions debris (MD), material potentially presenting an explosive hazard (MPPEH) at the Central Valley Floor and Associated Wetlands (CVFAW) to a depth of 14 inches below ground surface (bgs).

Former CBMR comprises approximately 3,840 acres and is located in southwestern Washington, approximately 5 miles east of the Vancouver City limits and approximately 3.5 miles north of the city limits of Camas (Figure 1). The former CBMR is approximately seven miles north of the Columbia River. The site is located in Township 2 North and Township 3 North of Range 3 East in the Washington Public Lands Survey system. The entire CVFAW includes approximately 432 acres of the former CBMR. The CVFAW is one of eight Remedial Work Areas that comprise Remedial Action Unit (RAU) 3 (Figure 2).

Between 1909 and 1995, live and practice munitions including artillery and mortar rounds, shoulder-fired rockets, land mines (practice only), grenades, and small-arms ammunitions were stored and used on the CBMR. The CVFAW was an extensively-used target and training area. The CVFAW includes Stokes Mortar Target Area, MEC Disposal Area (Burial Pit), Open Burn/Open Demolition Area, 37 millimeter (mm) Artillery/Stokes Mortar Target Area, 2.36-inch Rocket Target Area near the Former Sewage Lagoons, and Rifle Grenade Target Area. Each of these specific areas is briefly described below:

Stokes Mortar Target Area

The Stokes Mortar Target Area is located just south of the midpoint of the CVF. Throughout the Stokes Mortar investigation area, multiple subsurface anomalies were identified in areas co-located with MEC on the surface that were indicative of this area being used as a target. The MEC and MD findings in the Stokes Mortar investigation area include numerous 3-inch Stokes mortars (fired, some fuzed and some unfuzed), 2.36-inch rockets (fired, some fuzed and some unfuzed) and one 37 mm projectile (fired and fuzed), a high explosive (HE) M-9 Rifle Grenade and numerous MD findings.

MEC Disposal Area (Burial Pit)

The MEC disposal pit is located within a flat-lying open field in the central portion of the CVF, west of Lacamas Creek. Several layers of grenade spoons, rocket parts (some can be identified as HE rocket parts), and miscellaneous munitions-related debris were identified. The pit was not investigated vertically, but has been defined laterally. Lateral delineation of burial pit defines it as a 50 foot by 50 foot area.

The recommended cleanup action in the Final RAU 3 CAP for the burial pit is complete excavation of the pit contents and proper disposal of the excavated material and implementation of institutional controls. This alternative was determined to be the most feasible permanent solution for this area and would achieve the RAU 3 remediation standard. The area is about 50 foot by 50 foot with an estimated depth of 10 feet for a total of approximately 4,000 cubic yards of material.

Open Burn/Open Demolition Area

The OB/OD area is located in the southern part of the CVF on its eastern border and just north of the ESA. This demolition area covers approximately 16.33 acres and was discovered during the CVF clearance action. Several inert 5-inch rocket warheads were identified on the surface as well as rocket slag from a thermite burn. The recent findings show the area has several subsurface anomalies indicative of additional potential MEC or MD. In addition, the area has several demolition craters indicative of past surface demolition activities. The majority of the area is located within an open flat area of the CVF. MEC and MD findings include 2.36-inch

rockets (one fired, fuzed), 3-inch Stokes mortars (fired, unfuzed), a 5-inch rocket warhead, a 37 mm HE (unfired and unfuzed), and other miscellaneous items.

37 mm Artillery/Stokes Mortar Target Area

The 37 mm and Stokes mortar target area is located east of the Stokes Mortar Target Area and was identified during investigation of the CVF. The area has several subsurface anomalies co-located with MEC discovered on the surface, indicative of additional potential MEC or MD. The area was also posted with an ”Impact Area” warning sign during the brush clearance as part of the CVF Interim Action and investigation. Numerous MEC and MD items requiring demolition (3-inch Stokes mortars and 2.36 inch rockets (fired, some fuzed and some unfuzed); smoke grenades; 37 mm projectiles (fired, fuzed), were found in this area, some of the items found were HE-type munitions (Appendix A).

2.36-inch Rocket Target Area Near Former Sewage Lagoons

The 2.36-inch Rocket Target Area is located east of the former sewage lagoon ponds in the northern part of the CVF. Based upon the density and type of findings discovered during MEC surface clearance, conducted as part of the CVF Interim Action and investigation, the area was considered a target area. MEC and MD findings included numerous 2.36-inch rockets and a smoke grenade.

Rifle Grenade Target Area

The Rifle Grenade Target Area is located east of former Field Small Arms Ranges 1 and 2 near or in Grid N-17 in the northern portion part of the CVF. Based upon the density and type of findings the area was considered a newly discovered target area. A number of M9 rifle grenades (fired, fuzed) and MD items were recovered from an area.

Associated Wetlands

Wetlands extend throughout the CVF along the Lacamas Creek basin and total approximately 120 acres. Although part of the CVF, these wetlands are discussed separately due to the existence of sensitive ecological habitats, easily disturbed soils, flora and fauna, additional regulatory Agency oversight and work safety concerns (i.e. unstable saturated soil conditions and stream banks).

1.3 ANTICIPATED PHASES OF WORK

The following is a description of the anticipated work phase:

Activity 1: Pre-Mobilization

Prior to the mobilization of the UXO clearance teams, several important pre-clearance field tasks need to be completed including:

- Positioning/establishment of explosives magazine
- Inspection of proposed access routes and pre-determined detonation areas.
- Establishment of semi-permanent survey monuments and/or control points by a licensed Washington State Surveyor.
- Clearing of brush, grass and small trees by a professional brush clearing contractor.
- Obtaining all the necessary permits

Activity 2: Mobilization

Mobilize equipment and personnel to the project site.

Activity 3: Site Set-up

Positioning/establishment of a site office trailer and mobile storage unit compound, including electricity/telephone.

Activity 4: Clearance of MEC/MD/MPPEH

- Digital Geophysical Mapping (DGM) and 14-inch bgs Removal Action (surface and subsurface) - where terrain permits use of DGM equipment;
- Analog Investigation and 14-inch bgs Removal Action - where terrain precludes the use of DGM equipment;
- Instrument-aided Surface Clearance - step-out area extending from the CVFAW; and
- Soil Excavation, Stockpiling, and Sifting – where DGM and analog investigations are not feasible.

- Removal and transport of MEC/MD/MPPEH, and/or other munitions-related metal debris.
- Demolition will be conducted on UXO.

Activity 5: Demobilization

Demobilize equipment, personnel, and site infrastructure.

1.4 CONTRACTOR ACCIDENT EXPERIENCE MODIFICATION RATE

WESTON's Intrastate Accident Experience Modification (EMR) since 2007 is provided below. An industry average EMR rate is 1. Weston is below 1, therefore better than average.

Year	Experience Modification Rate
2011	.54
2010	.52
2009	.43
2008	.38
2007	.32

Notes:

Calculated by measuring the difference between a Company's actual past workers' compensation claims as compared to the average expected claims experience for companies performing the same type of work. An EMR is calculated using a rolling 3-year period.

2. SAFETY AND HEALTH POLICY

2.1 HEALTH AND SAFETY POLICIES

WESTON personnel operate in a culture where safety, health, and protection of personnel and the environment take precedence over expediency. A fundamental premise of our Behavior-Based Safety (BBS) culture is that accidents are preventable through choosing safe proactive behaviors. WESTON's policy on Health and Safety emphasizes several important points:

- WESTON has established a goal of working safely 100% of the time (employees and contractors) with the expected outcome being zero incidents that result in injuries, illnesses, property damage or environmental damage or contamination.
- All managers and workers accept as their responsibility a concerted and sustained effort to achieve a goal of Safety Every Minute of Every Day.
- All managers and workers assume a safety leadership role.
- All managers and workers take action for safety, coach peers in safe practices, and share experiences, successes, and failures.
- Workers are involved in the identification and control of workplace hazards during work planning, work execution, and feedback activities.
- Management is committed to a work environment that allows free and open expression of safety concerns, and where workers fear no reprisals or retaliation.
- Workers are our most important assets to WESTON and critical resources for establishing, implementing, and observing safe work practices.

2.1.1 100% Safe Work and Stop Work Policy Statement

For each activity and contract under which WESTON performs work, a policy is implemented clearly stating that WESTON employees have the responsibility and right to stop or curtail any work they perceive to be unsafe (a threat to public health, the safety and health of workers, or the environment). Employees must be free to voice concerns about safety and health without fear of

reprisal, retaliation, or harassment. This policy is implemented by a clear, straightforward contract-specific procedure as part of the WESTON Integrated Safety Management System.

To support the WESTON goal of all employees and subcontractors working safely – 100% of the time, all managers will utilize every available resource to maintain safe, hazard-controlled work environments characterized by a vigorous emphasis on accident prevention. Standards, requirements, and best practices will be implemented in a manner that maximizes the prevention of accidents. Managers will ensure that all employees are knowledgeable of those standards, requirements, and best practices that pertain to their safety.

WESTON managers and supervisors are held directly accountable for the health and safety of their employees, subcontractor activities and other resources employed to maintain employee health and safety, and the continual communication of hazards and hazard controls to the workforce.

2.2 PROGRAM GOALS

WESTON has implemented a BBS program where employees assume a safety leadership role and are responsible for the safety of coworkers, team members, visitors, and stakeholders. As part of our BBS program, our employees create high-quality connections with one another, team members, and stakeholders to foster an active, caring culture. Commitment is high, and we help each other be Safe Every Minute of Every Day to achieve our corporate goal of Zero Accidents involving personnel and the environment.

2.3 PROGRAM OBJECTIVES

The WESTON BBS program objectives include the following:

- EHS staff, resources, and procedures are provided as necessary and used in an efficient and cost-effective manner to establish a safe work environment for WESTON employees, subcontractors, clients, and the general public.
- Compliance with environmental, health and safety regulations is assured, and risk is managed and minimized for all employees, as well as the corporation.
- Management involvement is established and maintained within the EHS Program.

- Clear lines of reporting, authorities, responsibilities, and performance expectations are established.
- World-class EHS culture is attained at our places of employment, in our homes, and in our communities through the elimination of at-risk behavior.

2.4 ACCIDENT EXPERIENCE GOAL

WESTON gathers information on all incidents in an electronic database that allows assessment of trends and causes of incidents. By learning from our past experience, we can plan to avoid recurrence of incidents. This information is available to every WESTON employee and is used in training as well as in the development of APPs, Site Safety and Health Plans (SSHPs), and Activity Hazard Analyses (AHAs). This is in keeping with WESTON's goal of working safely 100% of the time and continuous improvement.

3. RESPONSIBILITIES AND LINES OF AUTHORITIES

3.1 STATEMENT OF EMPLOYER'S RESPONSIBILITY

As the employer, WESTON is ultimately responsible for the implementation of the EHS Program through enforcing the safety and occupational health (SOH) for this project as stated in the APP and SSHP (Attachment A). WESTON's senior and corporate management is committed to operating projects in a manner consistent with controlling EHS legislative, regulatory, and client requirements, and other applicable requirements administered by federal agencies.

3.2 IDENTIFICATION OF PERSONNEL RESPONSIBLE FOR SAFETY

Table 1 lists the key project personnel responsible for Safety Program implementation for the 14-inch bgs MEC Removal Action. Resumes for key WESTON safety personnel are included in Attachment 2. Key responsibilities of each position are provided in Table 2. Accountability for health and safety at all levels flows from the WESTON Chief Executive Officer through a matrix system, as indicated in organizational chart shone on Figure 3.

3.3 COMPETENT PERSON

According to OSHA Regulation 29 CFR 1926.32, site personnel will include a Competent Person. Specific OSHA and USACE regulations identify the need for involvement of competent persons. A list of competent person requirements and regulatory references is presented in Table 3. Mr. Randal Schneider meets these requirements and has been approved by WESTON's Corporate Environmental Health and Safety Management. No work will be performed without a Competent Person on-site.

Mr. Schneider is a competent person as stated in OSHA 29 CFR 1926.32. Mr. Schneider has performed work on a site(s) of similar hazard, risk, and complexity to the task assignment, and is certified in first aid and cardiopulmonary resuscitation (CPR). Mr. Schneider also has at least one year of experience implementing safety and occupational health procedures and experience conducting exposure monitoring to select and adjust personal protective equipment (PPE); however, it is unlikely that such adjustments will be needed.

The qualifications of site-specific personnel will be maintained on-site. The certifications and overall qualifications of all WESTON personnel are maintained in a database supported by WESTON (Attachment 7).

3.4 QUALIFIED PERSON

Site personnel will also include a Qualified Person. WESTON will permit only those employees qualified by training or experience to conduct unexploded ordnance (UXO) operations, or operate equipment and machinery in compliance with OSHA 29 CFR 1926.20(b)(4). According to OSHA 29 CFR 1926.32, "qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project. Table 4 provides the qualified person's requirement list.

The SUXOS, UXOSO, UXO Quality Control Supervisor (UXOQCS), and UXO Technicians III, II, and I will meet the requirements of the DDESB Technical Paper (TP) 18 for the positions assigned.

The qualifications of all site-specific personnel will be maintained on-site. The certifications and overall qualifications of all WESTON personnel are maintained in a database supported by WESTON. Documentation will be reviewed and maintained by the UXOSO.

3.5 PRE-TASK SAFETY AND HEALTH ANALYSIS

Pre-Task Safety and Health Analysis begins for WESTON at the proposal phase utilizing available documentation and site visits. The process continues through development of the APP, AHAs, and the SSHP.

WESTON has extensive experience at MEC removal actions and has used this knowledge in developing the AHAs. The Project Manager (PM) or SUXOS/Site Manager will ensure that a survey is conducted for each work area during mobilization to identify sources of all types of hazards and confirm that the APP, AHAs, and SSHP address these hazards. This phase of the Pre-Task Safety and Health Analysis is used to update the AHAs provided in Section 12 of the APP. The Hazard Assessment Certification Form is provided as Attachment 6.

During the walk-through survey, the PM or the MEC Response and Removal Task Manager, SUXOS and UXOSO will determine the level of PPE required for the work areas and specific activities. They will evaluate potential physical hazards associated with the work areas and specific work activities (e.g., walking/working surfaces, electrical installations/lines, and noise exposure) and select PPE to mitigate identified hazards. Consideration will be given to biological and climatic conditions and selection of PPE to accommodate the conditions (e.g., cooling units, insulated clothing/footwear, snake chaps).

3.6 LINES OF AUTHORITY

Lines of authority are provided on Figure 3.

3.7 NONCOMPLIANCE, DISCIPLINARY ACTIONS, AND COMPANY'S SAFETY INCENTIVE PROGRAMS

3.7.1 Noncompliance

Although non-compliance is not expected, safety and health program violations can and will result in disciplinary action up to and including dismissal. All employees understand that safety is of the utmost importance at WESTON. All personnel understand the importance of compliance with all applicable regulations and project requirements.

3.7.2 Disciplinary Actions

Personnel violating safety procedures are subject to dismissal/removal from the project site.

3.7.3 Incentive Programs

Project-specific financial and other incentive plans are developed and integrated with safety and health goals as an overriding component.

3.7.4 Safety Solutions Program

Safety Solutions is a program that provides WESTON's employees positive opportunities to become engaged in the Safety and Health Program. Employees are encouraged to utilize the Safety Solutions Program to report near incidents or to identify workplace hazards and their

proposed solutions. The submitted Safety Solutions are evaluated, and the authors of the most highly regarded solutions are eligible for a financial bonus and other rewards.

3.8 MANAGEMENT ACCOUNTABILITY FOR SAFETY

WESTON managers and supervisors are held directly accountable for the health and safety of their employees, for subcontractor activities, and for the continual communication of hazards and hazard controls to the workforce. The Division Health and Safety Officer will assess the safety and health performance of employees.

The accountability of supervisors and managers for the implementation of the health and safety program is ensured through monthly project life cycle reviews with senior management and through annual employee performance reviews.

4. SUBCONTRACTORS AND SUPPLIERS

WESTON will provide oversight and coordinate on-site/field activities to ensure the successful execution of tasks described within this APP. Each subcontractor is responsible for providing supervision of its employees (as defined by 29 CFR 1910) and will provide qualified personnel and/or competent persons as, and where, required by law or regulation. Unless otherwise agreed to and documented in writing, each subcontractor will be responsible for managing and recording any injury or incident involving its employees as required by OSHA or other applicable laws and regulations. In cases where a site has multiple employers that may be impacted by site activities, coordination with each affected employer will be required. At a minimum, a copy of the APP and the applicable AHAs shall be offered to and discussed with each affected employer at a preparatory meeting. The purpose of the meeting will be to coordinate work activities and share pertinent emergency response information.

A record of the meeting will be maintained in the project file on-site. Unless project conditions change that warrant communication to discuss work activities, it shall be the employer's responsibility to share relevant information regarding site activities to affected personnel.

4.1 IDENTIFICATION OF SUBCONTRACTORS AND SUPPLIERS

Subcontractors currently known and anticipated to work on the project are in identified in Table 5. Suppliers (e.g., roll-off delivery/pickup, explosives delivery) will be used and will comply with all applicable safety requirements while on-site.

4.2 CONTROL AND COORDINATION OF SUBCONTRACTORS AND SUPPLIERS

WESTON is ultimately responsible for ensuring subcontractor and supplier compliance with the APP and SSHP for MEC clearance. The subcontractor will assign a Site Safety Representative who will be responsible for coordinating projects and safety responsibilities for their personnel as designated and directed by the WESTON UXOSO. Non-compliance with this plan will result in a stop work order, as determined by the UXOSO.

4.3 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS

The Site Safety Representative will interact with the UXOSO to ensure compliance with this APP. Subcontractor employees are expected to comply with this APP, USACE EM 385-1-1, and other applicable regulations governing their safety while on the project. In the event of a conflict, the more stringent requirements will apply. The Site Safety Representative will:

- Attend all health and safety briefings
- Address worker issues and immediately stop work if unsafe acts/conditions exist or if uncertainty associated with how a task is to be performed exists
- Coordinate corrective action with the UXOSO prior to resuming operations
- Participate in any incident investigations
- Inspect operations and work areas daily, in conjunction with the UXOSO
- Ensure subcontract workers have the proper PPE
- Control all hazardous material brought on-site

4.4 SUBCONTRACTOR SAFETY PLANS

WESTON subcontractor employees are covered by this APP and will be required to sign the Acknowledgement Form in the SSHP indicating that they have read and understand both the APP and SSHP and agree to follow the requirements in these documents. The UXOSO will obtain and verify the subcontractor personnel training records prior to subcontracted work activities commencing.

5. TRAINING

5.1 GENERAL

Personnel assigned to the 14-inch bgs MEC removal action have received the required training. Records of the required training are maintained in the WESTON Corporate EHS database and records of required training will be available on-site at all times.

5.2 SAFETY INDOCTRINATION

When hired, WESTON staff members are required to complete EHS training appropriate to their role and responsibility level, which often involves hazardous, toxic, and radioactive waste and/or UXO. New hires that have previously completed such training are required to provide documentation of training. All training, including refresher training, is documented in WESTON's corporate recordkeeping software, EHSTrack.

New employees also participate in WESTON's orientation training program. All personnel receive training on WESTON's EHS policies, including environmental aspects, emergency action plans, security plans, ergonomics, incident-reporting procedures, BBS, and site/job specific training. Site-specific topics will include:

- Accident prevention
- Accident reporting (how and to whom)
- Medical facilities for emergency treatment and/or assistance
- Reporting and correcting unsafe conditions
- Job hazards/hazard control
- Site specific biological, physical, chemical, and or ionizing/no ionizing radiation hazards as listed in the AHA
- Company safety policies
- Site briefings conducted prior to being granted site access
- Site layout

- Hazard control
- Emergency response and notification
- Hearing conservation
- PPE
- Buddy system
- Spill prevention
- Fire prevention
- Hazard communication
- Visitor access
- Any specific training required by regulations

5.3 MANDATORY TRAINING AND CERTIFICATIONS

Listed below are the training and certifications required for the 14-inch bgs MEC removal action. Additional details of this site-specific training are described in Section 5 of the SSHP (Attachment 1).

- UXO training certification for UXO technicians as documented in DDESB TP-18
- Washington Blasters License—A minimum one person if conducting demolition operations
- 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER)
- 8-hour HAZWOPER Refresher
- OSHA 30-hour Construction Safety Training—At a minimum the UXOSO
- First-Aid/Cardiopulmonary resuscitation (CPR)/Blood borne Pathogens—At a minimum two people

Table 6 provides the training and certifications for site personnel.

A copy of applicable training records for project personnel will be available on-site and maintained by the UXOSO.

5.4 PERIODIC SAFETY AND HEALTH TRAINING

The UXOSO will present daily site safety briefings (i.e., tailgate meetings) to on-site personnel prior to the start of the work shift. The purpose of the briefings is to assist personnel in safely conducting the scheduled work activities. The briefings will include the following:

- Tasks to be performed and work method and general description of job scope
- Work location
- Equipment usage
- Control of hazards
- Weather conditions
- Emergency response review

The briefings provide an opportunity for individuals to share observed safety deficiencies and recognitions. Attendance at these daily safety briefings is mandatory and will be documented by the UXOSO.

In addition to the daily site safety briefings, a formal safety meeting will be conducted at least monthly for all UXOSO's within their respective divisions. A safety manager or designee will be invited to attend this monthly meeting.

5.5 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING

At least two site personnel will have current training in first aid and CPR. All site personnel will be trained in the use of fire extinguishers to provide emergency response. In the event specialized/elevated care is necessary, either WESTON or the local on-call emergency medical technician (EMT)/ambulance service will transport the injured person to the appropriate medical facility. Outside assistance will be requested as detailed in the Emergency Response Plans included in the SSHP.

WESTON personnel involved with responding to an on-site emergency will be briefed in their roles and responsibilities as part of the initial indoctrination training discussed above. During this training, personnel will be briefed on the Hazard Communication (HAZCOM) Program, emergency equipment, and first aid procedures, as described in the SSHP. Personnel will also be

briefed on emergency response and contingency procedures presented in Section 15 of the SSHP, which include:

- Procedures and tests
- Spill prevention
- Firefighting
- Posting of emergency telephone numbers
- Medical support

This training will be documented and will also involve a rehearsal of the emergency response procedures prior to the start of site activities. During this training, the route to and location of the evacuation point and the location of medical support will be discussed with each staff member.

6. SAFETY AND HEALTH INSPECTIONS

6.1 SPECIFIC ASSIGNMENTS OF RESPONSIBILITIES

The UXOSO will conduct and document daily safety and health observations on the project log. Weekly inspections will be conducted by the UXOSO utilizing the EHS Inspection Checklist provided in Attachment 3. The qualifications and certifications of the inspector (e.g., the UXOSO or CIH) are provided in Attachment 2 of this APP. In addition, the UXO Quality Control Specialist (UXOQCS), as part of the QC responsibilities, will conduct and document daily safety and occupational health inspections in the daily QC logs.

6.2 INSPECTIONS/AUDIT FREQUENCY

Inspected by	Daily	Weekly (Environmental Health and Safety Inspection Checklist)	Monthly	Quarterly
UXOSO	X	X		
CIH or designee			X	X

6.3 DEFICIENCY TRACKING

A deficiency tracking form presented in Attachment 4 will be used to document unacceptable work practices. The deficiency tracking form lists and monitors the status of safety and health deficiencies in chronological order; displays the type and description of the deficiency; the risk rating; code reference; the corrective action taken and the projected resolution date; date resolved; and the person responsible for the corrective action. The deficiency tracking system will be posted on the safety bulletin board and will be updated daily. In most cases, discrepancies of greater severity are corrected immediately, or within 24 hours if they are of lower severity.

When a deficiency is identified, the UXOSO will follow-up by updating the deficiency tracking form to indicate the specific corrective action, the person(s) responsible for the corrections, and the date by which the action needs to be accomplished. The UXOSO/SUXOS will also follow up by ensuring that the corrective action is accomplished in the timeframe indicated. During health

and safety audits, the deficiency log is reviewed to ensure that the corrective action process has been implemented. The information from the deficiency tracking form is presented in daily safety meetings and monthly supervisor meetings so that lessons learned are disseminated.

6.4 EXTERNAL INSPECTIONS/CERTIFICATIONS

Although no external inspection is expected, regulatory agencies do conduct inspections from time to time. An inspector should be treated as a professional and with courtesy. The regulatory agency inspector should introduce himself/herself to the manager in charge of the operation and present credentials to verify that he/she is representing a recognized regulatory agency, such as OSHA, DOT/ International Air Transport Association (IATA), EPA, or Washington Department of Ecology (WDOE). Personnel who cannot demonstrate their affiliation with a recognized regulatory agency should not be allowed access to the project site or office.

Any pre-inspection conference will be attended by the UXOSO and a safety representative, at a minimum. At that time, the scope of the inspection should clearly be described by the inspector. If the inspector has not described the scope of the inspection during the pre-inspection conference, ask the inspector to provide such description.

Prior to taking the inspector on-site or into the office trailer, it is necessary to contact the Project Manager, Project Safety Officer, and either the Division Safety Officer or Corporate Environmental Health and Safety. The inspector will perform the inspection, which may include a walk-through inspection of the work-site or a targeted file/records review. The site or office inspection typically ends with a close-out conference during which the inspector may provide tentative findings. In some cases the inspector may forego the close-out conference and issue a written citation after leaving the site. On occasion, inspections may require more than one day.

Most regulatory agency inspectors seldom issue citations during the inspection; however, if an OSHA or EPA inspector observes an imminent hazard, he/she can order a work stoppage.

It is WESTON's practice to cooperate with investigations. Information that is requested should be provided; however, requests for copies of documents, health and safety plans, and training

records should not be provided without first obtaining approval from WESTON's Law Department. Under no circumstances should any attempt be made to mislead the inspector.

Coordination of any regulatory agency inspection is the responsibility of the UXOSO who will accompany the inspector during all stages of the inspection.

7. ACCIDENT REPORTING

The UXOSO will report all incidents, near incidents, all injuries or occupationally related illness, spills, thefts, or other site issues to the Division Health and Safety Officer within 1-hour of the occurrence, or as soon as physically possible. The necessity for prompt notification is to ensure appropriate and adequate assistance to the site personnel.

The USACE Form 3394 Accident Investigation Report (Attachment 5) and the WESTON electronic incident reporting and notification process (NOITrack) must be submitted to the Division Environmental Health and Safety Officer and Corporate EHS Manager within 24 hours of the incident. All incidents will be reported to the Contracting Officer (KO)/Contracting Officer's Representative (COR) as soon as possible but not more than 24 hours after the incident to be followed within 5 days by using USACE Form 3394 except for incidents requiring immediate notice, then follow Section 8.3.

7.1 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS

The reporting requirements following all incidents, near incidents, spills, thefts, or other site

issues is as follows:

- Within 1-hour—call Division Environmental Health and Safety Officer
- Within 24 hours—complete NOITrack
- Within 24 hours—Preliminary accident notification to KO/COR
- Within 5 days— USACE Form 3394

All incidents, near incidents, injuries or occupationally related illness, spills, thefts, or other site issues will be reported to the WESTON Federal Team Safety Manager or Division Environmental Health and Safetey Officer within 1 hour of the occurrence, or as soon as physically possible. WESTON investigates all incidents, including near incidents or "near misses." No supervisor will decline to accept a report of injury from a subordinate. Investigation findings, along with appropriate corrective actions, will be reported to the KO/COR in the prescribed format as soon as possible but no later than 5 working days following the injury/accident. Corrective actions will be implemented as soon as reasonably possible.

Incidents meeting the OSHA definitions of recordable incidents are logged on the WESTON 300 logs, and the UXOSO also logs these incidents on the on-site OSHA 300 log.

7.2 NOITRACK

WESTON's NOITrack is used to document all incidents, near incidents/misses, corrective action plans, and investigations involving WESTON-managed work. Incidents include the following: employee accidents, injuries, auto accidents, property damage/loss, utility damage, information/data breaches, security concerns/breaches, break-ins, subcontractor injuries/accidents/events, OR any other liability situation or circumstance that could give rise to a claim. For example, spills/discharges resulting from the installation of equipment or systems by WESTON or our subcontractors should be reported using the NOITrack system. Basically, an NOI must be submitted if something happens on a project that was not intended and could result in liability for WESTON.

The WESTON NOITrack must be completed within 24 hours of the incident occurrence. NOITrack can be accessed on the WESTON Portal, EHS homepage.

7.3 USACE FORM 3394

An accident in which the resulting total amount of property damage is $2,000 or more, but less than $50,000; a non-fatal injury or occupational illness to contractor personnel resulting in restricted work, transfer to another job, medical treatment greater than first aid, needle stick injuries and cuts from sharps that are contaminated from another person's blood or other potentially infectious material, medical removal under medical surveillance requirements of an OSHA standard, occupational hearing loss that meets OSHA recordability criteria, or a work-related tuberculosis case.

All incidents will be reported to the KO/COR by using Preliminary Accident Notification (PAN) (Attachment 6) as soon as possible, but not more than 24 hours after the incident. The USACE Form 3394 Accident Investigation Report (Attachment 5) must first be submitted to the Division Health and Safety Officer and Corporate Environmental Health and Safety Manager to be forwarded on to the KO/COR within 5 days.

7.4 FIRST AID

Any injury that is considered to be non-reportable through means of basic first aid treatment (i.e., paper cut/non-allergy bug bites, etc) will be recorded in the UXOSO log.

7.5 IMMEDIATE ACCIDENT NOTIFICATION

WESTON will notify OSHA within 8 hours of any fatality or single incident that results in the hospitalization of three or more persons.

The following incidents require immediate notification, no later than one hour, to the KO/COR, or designee. The written follow-up to the KO/COR will utilize USACE Form 3394 Accident Investigation Report (Attachment 5):

- Fatalities
- Permanent total disability
- Permanent partial disability
- Hospitalization of three or more people resulting from a single occurrence
- Property damage of $500,000 or more

7.6 ACCIDENT REVIEW

Any accident that occurs while an employee is driving on Company business, or operating a WESTON-owned, leased, rental or allowance vehicle at any time will be reviewed and investigated. Drug and/or alcohol testing will be conducted in a timely manner in accordance with WESTON Drug and Alcohol Operating Practice (05-01-010). The accident review is intended to determine whether the accident was “preventable” as defined by the National Safety Council. The investigation will also include consideration of citations issued, if any, and the specifics of the accident to determine appropriate consequences, if any. Investigation may result in outcomes such as recommendation for driver training programs, changes or modifications to vehicle/equipment, suspension of driving privileges, or employee termination. Typically, auto accident investigations will be coordinated on a divisional level, similar to protocols established by Corporate EHS and divisions for other root-cause investigations. Risk Management will provide input and guidance and serve as a liaison with insurance carriers, as needed.

8. MEDICAL SUPPORT

8.1 ON-SITE MEDICAL SUPPORT

In the event specialized/elevated care is necessary, either WESTON or the local on-call EMT/ambulance service will transport the injured person to the Peacehealth Southwest Medical Center in Vancouver, WA. The local Fire and EMS Department can be notified of emergency situations by calling 911 (non-emergency telephone numbers are listed in Table 7).

A first-aid kit will be provided on-site, and will be in compliance with the criteria contained in American National Standards Institute Z308.1-2009.

In case of injury, the following procedures apply:

- For minor injuries, routine first aid procedures will be used.
- For major injuries, an ambulance will be called immediately, and the appropriate first aid administered while awaiting the arrival of the ambulance.
- Trained personnel will use approved measures for treatment based on the training they have received.

8.2 OFF-SITE MEDICAL SUPPORT

Table 7 provides emergency and non-emergency contact information.

8.3 DIRECTIONS AND MAP TO NEAREST HOSPITAL

Hospital Route

The medical center identified for this project is the PeaceHealth Southwest Medical Center located in Vancouver, Washington. The facility is approximately 10 miles southeast of the Site. Travel time is approximately 25 minutes. Maps showing the route to the hospital will be posted near the site telephone and in a Weston vehicle on-site and included as Figure 4. Directions to the hospital are as follows:

1. Exit Camp Bonneville from south on NE 232nd Ave.

2. Turn right onto NE Fourth Plain Road (State Road 500).
3. Go west on State Road 500 approximately 3.5 miles and turn left (south) on US Route 205. Continue approximately two miles and turn right on East Mill Plain Boulevard.
4. Travel approximately one mile and Peacehealth Southwest Medical Center will be on the right. The map on the following page illustrates the medical center's location.

End: PeaceHealth Southwest Medical Center
8716 East Mill Plain Boulevard
Vancouver, WA 98664
(360) 256-2000

8.4 FIRST AID AND CPR TRAINING

Name	First Aid (Expiration Date)	CPR (Expiration Date)
Randal Schneider	3/3/13	3/3/13
Bruce Moe	1/29/13	1/29/13
Donald Kean	1/29/13	1/29/13
Matt Gifford	1/29/13	1/29/13

8.5 MEDICAL SURVEILLANCE

Since 1980, WESTON has utilized a comprehensive Occupational Health Program (OHP) that complies with OSHA and USACE requirements. Site personnel and subcontractors who enter the site during operations that are being conducted must comply with a comparable OHP. Personnel will be required to provide their certifications to the UXOSO for review and approval prior to being granted authorization to work. Certifications will be stored and maintained at the project office.

8.5.1 Occupational Health Program

To comply with OSHA requirements, WESTON has designated Dr. Peter Greaney of WorkCare the responsibility of overseeing the site-specific medical surveillance and OHP. Dr. Greaney is a board-certified physician in internal and occupational medicine. **Dr. Greaney can be reached during regular business hours at (800) 455-6155.**

The purpose of the OHP is to ensure suitable job placement of employees, to monitor the health effects of hazards encountered in the work place, and to maintain and promote good health through preventive measures. Medical examination criteria are established by WorkCare in compliance with 29 CFR 1910.120.

9. PERSONAL PROTECTIVE EQUIPMENT

9.1 HAZARD ASSESSMENTS

Personnel performing operations on-site will be required to use the appropriate level of protection. This APP makes provisions for use of level D, as required for the hazards associated with a given task, operation, or expected contaminant level. PPE requirements for site operations, activities, or zones are based upon available historical site characterization data provided to WESTON. Changes in levels of PPE will be made and upgraded or downgraded based on data derived from site-specific Monitoring Plans. The levels of PPE will also need to be reassessed if any of the following occur:

- Presence of or potential for previously unidentified chemicals or conditions
- Airborne concentrations of known chemicals exceed the action levels
- Changes in ambient weather conditions
- Assignment of new tasks or expansion in the scope of a previously evaluated task

The selection of monitoring equipment will be determined by site-specific contaminants, as described in the SSHP.

For this project, the Corporate EHS Manager and the UXOSO are responsible for overseeing development and implementation of the PPE Program. Once on-site, the UXOSO is responsible for ensuring that a survey is conducted for each work area to identify the sources of hazards, including impact, penetration, compression, chemicals, heat, dust, electrical sources, material handling, and light radiation. To assist with this survey, the Hazard Assessment Certification Form is provided in Attachment 6.

9.2 IDENTIFYING WHEN HAZARD ASSESSMENTS WILL BE CONDUCTED

Hazard assessments are conducted during the site walk and document review. During the initial PPE decision-making process, the APP/SSHP preparer reviewed available site information and established the level of protection to be worn by site personnel for each task. Additional hazard assessments will be conducted periodically and when field activities or site conditions change.

9.3 IDENTIFYING HOW HAZARD ASSESSMENTS WILL BE CONDUCTED

Selection of the most appropriate level of protection depends on the following:

- Hazards, known or potential
- Properties such as toxicity, radioactivity, route of exposure and matrix (i.e., air, soil, water) in which the contaminants are known or suspected
- Type and measured concentrations of contaminants
- Potential for exposure based upon task
- Physical hazards
- Biological hazards
- Chemical hazards

Once the hazards of a workplace have been identified, the UXOSO (in consultation with the appropriate safety professionals) will evaluate the suitability of the PPE that was initially selected. New or additional PPE will be selected as conditions change to ensure a level of protection that will protect the employees from the hazards. Care will be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards.

The levels of personal protection and the procedures specified in this plan are based on the best information available from reference documents and current site data. Therefore, these recommendations represent the minimum safety and health requirements to be observed by personnel engaged in this project. Unforeseeable site conditions or changes may warrant a reassessment of protection levels and controls stated. Adjustments to the APP must have prior approval by the Corporate EHS Manager and Clark County.

9.4 PERSONAL PROTECTIVE EQUIPMENT TRAINING

In accordance with OSHA 29 CFR 1910, Subpart I, PPE will be provided, used, and maintained in a sanitary and reliable condition. PPE will be of the construction, design, and material to provide employees protection against known or anticipated hazards. PPE will be selected that properly and appropriately fits the employee. WESTON personnel have been provided training

in accordance with OSHA. Any concerns regarding the use of appropriate PPE will be brought to the attention of the UXOSO, who is directed to contact the Corporate EHS Manager for assistance in evaluation of PPE, as necessary.

Work activities for the 14-inch bgs MEC removal action will be completed in Level D PPE. If higher levels of protection are required, an addendum to the APP and SSHP will be drafted and approved by the Corporate EHS Manager and Clark County.

Any worker required to wear PPE shall receive training in the proper use and care of PPE. Periodic retraining will be offered by the Corporate EHS Manager or designee to both the personnel and supervisors, as needed. The training shall include, but not necessarily be limited to, the following subjects

- When PPE is necessary to be worn
- Type of PPE that is necessary
- How to properly don, doff, adjust, and wear PPE
- The limitations of PPE
- The proper care, maintenance, useful life, and disposal of PPE

Typical delivery of training is through formal programs such as HAZWOPER training, refresher training, or specific hazard training. Additional training is offered through routine site training and site-specific training. After the training, personnel shall demonstrate that they understand the components of the PPE Program and how to use PPE properly, or they shall be retrained.

9.5 PERSONAL PROTECTIVE EQUIPMENT RETRAINING

Typical delivery of re-training is through formal programs such as HAZWOPER training, refresher training, or specific hazard training. Additional training is offered through routine site training and site-specific training.

9.6 IDENTIFYING EMPLOYEE TRAINING

Project personnel will have appropriate training as determined by the Corporate EHS Manager. Required training and certifications are reviewed internally as part of the APP and SSHP development prior to the start of the project. WESTON has an on-line system, EHSTrack, to

allow rapid access and reporting of personnel training. WESTON can track the current EHS status of WESTON personnel assigned to each project. Safety officers use EHSTrack to update EHS contact information, view EHS personnel training certifications, and view medical clearances. The UXOSO will verify each person's EHS status prior to the start of work and will periodically perform reviews for updates. Key site personnel training/certifications are provided in Table 6.

10. PLANS REQUIRED BY EM 385-1-1

Plans, programs, and procedures required by EM 385-1-1 and their disposition in the APP or SSHP are provided in Table 8.

10.1 LAYOUT PLANS

No temporary construction buildings, facilities, fencing, and access routes for temporary structures will be required for this project. Therefore, Sections 04.A and 11 (temporary power distribution) of EM 385.1-1 will be applicable as appropriate.

10.2 ACCESS AND HAUL; ROAD PLAN

No significant road construction activities are planned.

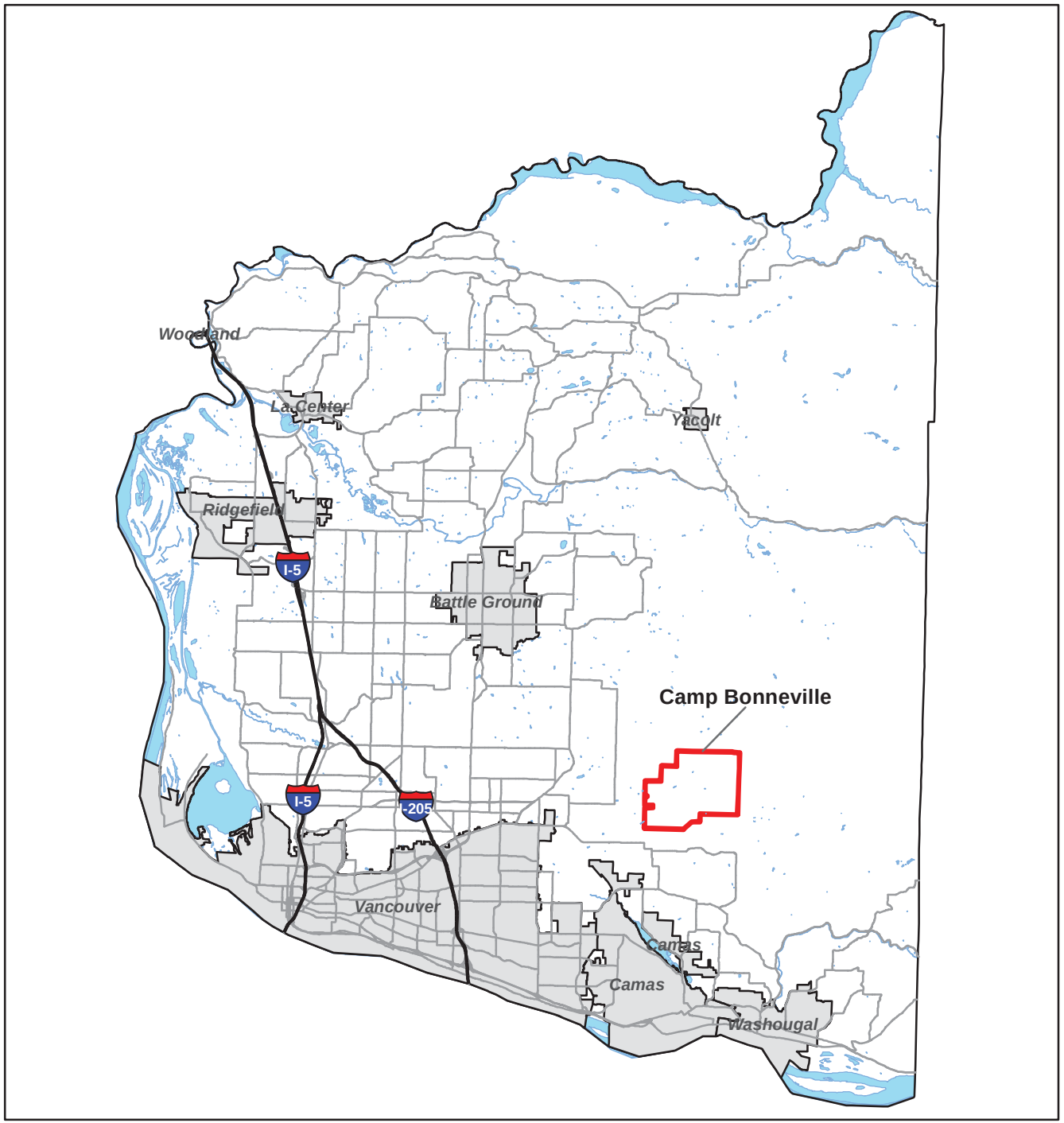
10.2.1 Existing Access Road

An existing road NE Pluss Rd will be used as a main access road.

11. RISK MANAGEMENT PROCESSES

The AHAs are provided in Table 9 and define the activities to be performed at CBMR 14-inch bgs MEC removal action and identify the sequence of work, the specific hazards anticipated, site-specific conditions, equipment and materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk. Reviews of the project-associated hazards will occur periodically and when field activities change.

FIGURES



N

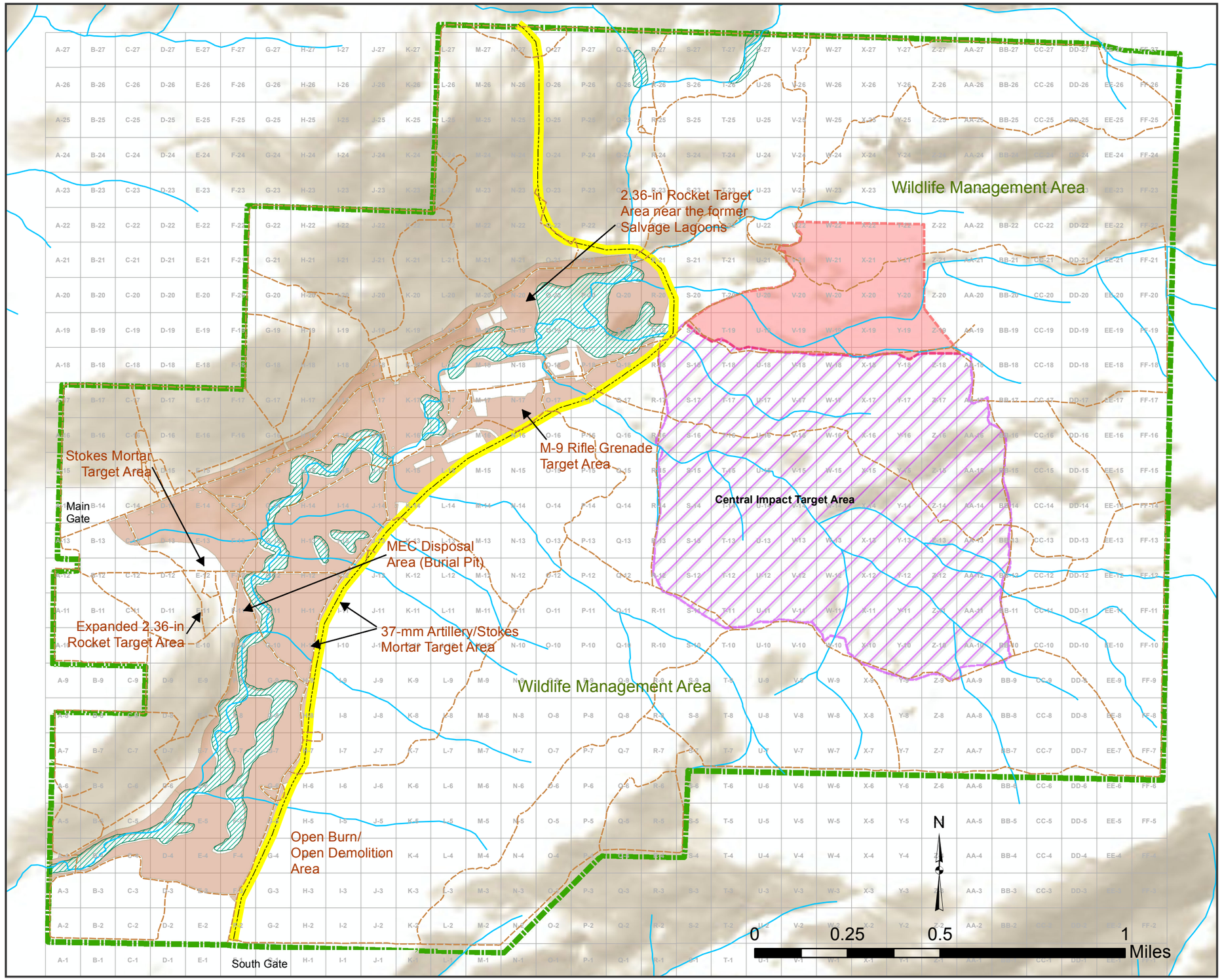
0 2.5 5 10 Miles

Clark County Public Works

FIGURE 1
SITE LOCATION

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



LEGEND

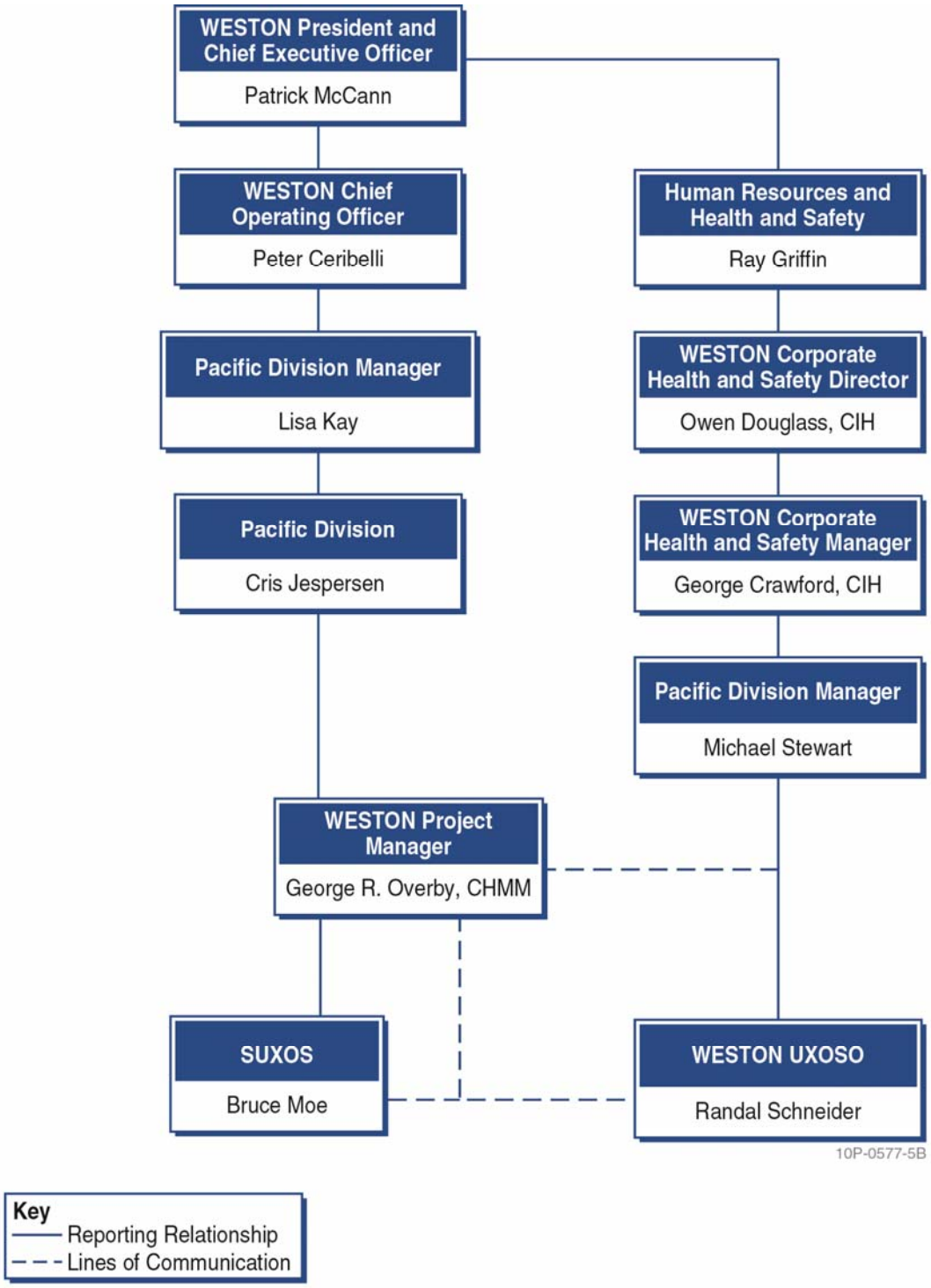
- Property Boundary
- Central Valley Perimeter Survey
- Central Impact Target Area
- Central Impact Target Area Expansion
- Wetlands
- Park Boundary
- Streams / Rivers
- Roads

Clark County Public Works

FIGURE 2
LOCATIONS OF CVFAW REMEDIAL WORK AREAS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



Clark County Public Works

FIGURE 3
HEALTH AND SAFETY ORGANIZATION CHART AND LINES OF AUTHORITY

Former Camp Bonneville Military Reservation
Vancouver, Washington

1. Exit Camp Bonneville from south on NE 232nd Ave.
2. Turn right onto NE Fourth Plain Road (State Road 500).
3. Go west on State Road 500 approximately 3.5 miles and turn left (south) on US Route 205. Continue approximately two miles and turn right on East Mill Plain Boulevard.
4. Travel approximately one mile and Peacehealth Southwest Medical Center will be on the right.

PeaceHealth Southwest Medical Center
8716 East Mill Plain Boulevard
Vancouver, WA 98664
(360) 256-2000

Clark County Public Works

FIGURE 4
HOSPITAL ROUTE TO PEACEHEALTH SOUTHWEST MEDICAL CENTER

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

TABLES

Table 1
Project Safety Team

Name	Position	Phone No. *
George Overby, CHMM	Project Manager (PM)	office: (864) 399-9902 cell: (864) 320-3409
George Crawford, CIH	Corporate EHS Manager	office: (610) 701-3771 cell: (484) 437-5976
Michael Stuart	Project Health and Safety Officer	office: (505) 837-6566 cell: (505) 259-7613
Bruce Moe	SSHO/UXOSO	cell: (831) 384-3222
Randal Schneider	SUXOS/Site Manager	cell: (360) 949-0225

Notes:
CHMM = Certified Hazardous Materials Manager
CIH = Certified Industrial Hygienist
*Phone numbers shall be confirmed/revised prior to field mobilization and revised during the project, as necessary.

Table 2
Position Descriptions

Position	Description of Key Responsibilities
Project Manager George Overby, CHMM	▪ Overall responsibility for the management and completion of the project. ▪ Responsible and accountable for project safety. ▪ Overall responsibility for ensuring that project personnel (including subcontractor personnel) comply with EHS regulations, program requirements, and procedures. ▪ Ensure development and implementation of project SSHPs and indicate concurrence with final plans after required EHS reviews. ▪ Ensure project personnel meet applicable safety certification requirements. ▪ Ensure project support is acquired from appropriately qualified safety personnel such as the Corporate EHS Manager, Division H&S Officer and SSHO/UXOSO. ▪ Ensure project personnel comply with applicable EHS requirements and corporate or client procedures. ▪ Halt any project work activities that represent an imminent hazard. ▪ Ensure appropriate safety equipment and materials are provided to the project. ▪ Ensure timely and accurate reporting and investigation of incidents, accident, or injuries involving project personnel, with support from the risk management department. Ensure corrective actions are implemented completely. ▪ Ensure proper response and internal notification regarding inspections by regulatory agencies. ▪ Ensure all project personnel have met the site-specific experience and training requirements.
Corporate EHS Manager George Crawford, CIH	▪ Approve and ensure the implementation of the WESTON Corporate EHS Program, the APP, SSHP and any amendments. ▪ Conduct field audits to assess the effectiveness and implementation of the APP and SSHP. ▪ Evaluate and authorize changes to the APP and SSHP based on field and occupational exposure, as necessary. ▪ Function as a quality control (QC) staff member.
Project Health and Safety Manager Michael Stuart	▪ Oversee and maintain the WESTON Corporate EHS Program, the APP and SSHP. ▪ Conduct site visits, as necessary, to audit the effectiveness of the APP and SSHP. ▪ Serve as a technical safety advisor and provides technical assistance and support. ▪ Develop the APP and SSHP. ▪ Develop modifications to the APP and SSHP as necessary.
SSHO/UXOSO Randal Schneider	▪ Responsible for implementing the APP and SSHP by ensuring that all project personnel follow the requirements of the APP and SSHP. ▪ Be present during UXO operations and ensure the implementation of the Explosives Safety Submission (ESS) Amendment. ▪ Directly communicates with the SUXOS/site manager, PM and EHS Manager. ▪ Conduct daily safety meetings for site personnel to discuss the day's activities, associated hazards, and UXO safety. ▪ Review site personnel training and experience documentation to ensure compliance with the APP and SSHP. ▪ Coordinate changes/modifications to the APP with the appropriate site personnel. Conduct or coordinate project-specific training. ▪ Report any incidents that occur on-site to the SUXOS/Site Manager, PM and Division H&S Officer. ▪ Implement safety corrective actions through training and reinforced awareness. ▪ Maintain exposure data. ▪ Has stop-work authority for all safety issues.

Table 3
Competent Person Requirements

Competent Person Requirement	Regulatory Reference	Person Designated
SSHO/UXOSO	EM 385-1-1 Sec. 01.A.17; Department of Defense Explosives Safety Board Technical Paper-18	Steven Bebow
Hazardous Waste Operations and Emergency Response	EM 385-1-1.28 29 CFR 1926.65	Steven Bebow
General Inspections of Construction Sites	EM 385-1-1.01.A.12 29 CFR 1926.20	Steven Bebow

Table 4
Qualified Person Requirement

Qualified Person Requirement	Designated Person(s)
Brief Visitors on Site Hazards and PPE	Steve Bebow
Licensed Blaster(s) for the State of WA	Michael Everman

Table 5
Subcontractor Contact Information

Subcontractor	Contact Information
B&B Brush Clearing, LLC.	7801 SE Clackamas Rd Portland, OR 97267 (503) 344-4404
PBS Engineering & Environmental (Natural Resource Support)	1310 Main Street Vancouver, WA 98660 (360) 690-4331
Pioneer Technologies (Lead Soils Support)	6700 Paradise Rd. St. A-2 Las Vegas, NV 89119 (702) 932-7690
Minister & Glaeser Surveying, Inc.	2200 E. Evergreen Blvd. Vancouver, WA 98661 (360) 694-3313
Timber Supply Explosives, Inc. (Donor Explosives)	2354 Main Street Philomath, OR 97370 (541) 929-3151

Table 6
Current Key Site Personnel Training/Certifications

Personnel	Position	EOD Certificate	Medical Clearance (expires)	40-Hour HAZWOPER	8-Hour HAZWOPER Refresher (expires)	30-Hour Construction Safety	Supervisors Health and Safety	First-Aid/CPR (expires)
Bruce Moe	Senior UXO Supervisor	3/84	12/12	9/88	6/12	4/04 (10hr)	6/03	1/13
Randal Schneider	SSHO/UXOSO	11/85	6/12	4/05	4/12	12/08	1/09	3/13
Donald Kean	UXO Quality Control Specialist	2/90	8/12	8/01	10/12	n/a	n/a	1/13

Table 7
Emergency Contact Numbers

Organization/Point of Contact	Telephone Number	Comment(s)
Ambulance Police/Security Med Evac Fire	911	
Peacehealth Southwest Medical Center	(360) 256-2000	8716 East Mill Plain Boulevard Vancouver, WA 98664
Weston 24-hr Medical Emergency & Toxicological	1-800-874-4676 (bus. hours) 410-507-3325 or 770-826-6517 (after hours)	Will reach answering service; leave number to call back.
Spill Response- CHEMTREC	(800) 424-9300	
National Response Center	(800) 424-8802	
Poison Control Center	(800) 962-1253	
Clark County, WA POC – Greg Johnson	(360229-0529	
WESTON Medical Director: Dr. Peter Greaney WESTON Program Director: Michelle Bui	From 06:00 to 16:30 Pacific Time, call 800-455-6155, dial 0, or extension 175, to request the on-call clinician	Both at WorkCare
After-Business Hours Contact (Emergency Only)	16:31 to 05:59 PST, weekends/ holidays: (800) 455-6155; dial 3, to reach the after-hours answering service. Ask service to connect with on-call clinician or have clinician return call within 30 minutes.	
WESTON Emergency (24 hour) (West Chester)	(610) 701-3720	
EPA Region 10 Environmental Emergency Response	**(800) 424-4372**	
Call-Down: after 911, call ASAP		
Weston PM – *George Overby*	(864) 320-3409 (cell) (864) 399-9902	
Weston CSO – George Crawford	(484) 437-5976	
Weston Risk Management – Susan Hipp-Ludwick	(610) 701-3046	West Chester Office
Weston Health and Safety 24-hr Health & Safety	(610) 701-3000	or call Owen Douglass (610) 506-5392 cell

See Attachment H for EMS/Rescue Confirmation and Evaluation.

Table 8
Plans Required by EM 385-1-1

Plan, Program or Procedure	Document Location
a. Layout plans (04.A.01)	Section 11.1 of this APP.
b. Emergency Response Plans	SSHP Section 15
(1) Procedures and tests (01.E.01)	SSHP Section 15
(2) Spill plans (01.E.01, 06.A.02)	SSHP Section 15.8
(3) Fire-fighting Plan (01.E.01, 19.A.04)	SSHP Section 15.7
(4) Posting of Emergency Telephone numbers (01.E.05)	SSHP Section 15.5, Table 15-1; Posted in Field Office Trailer
(5) Man overboard/abandon ship (19.A.04)	This plan is not required because no marine activities are anticipated.
(6) Medical Support (Section 03.A.02; 03.D)	APP Section 9
c. Plan for prevention of alcohol and drug abuse (01.C.02)	SSHP Section 10.8
d. Site Sanitation Plan (Section 02)	SSHP Section 10.12
e. Access and Haul Road Plan (4.B)	This plan is not required because no haul road activities are anticipated. Section 11.2 discusses access into the work areas.
f. Respiratory Protection Plan (05.G)	This plan is not required because no activities requiring respiratory protection are anticipated.
g. Health Hazard Control Program (06.A)	APP Section 12, AHA; SSHP Section 3
h. Hazard Communication Program (01.B.01) Provide the location of the (Material Safety Data Sheet) MSDS, records of contractor employee training, and inventory of hazardous materials (including approximate quantities and a site map) that will be brought onto Government project by the contractor and subcontractor.	SSHP Section 3.3 and Annex 2. Maintained on-site by the SSHO.
i. Process Safety Management Plan (06.B.04)	This plan is not required because no highly hazardous chemicals are associated with the work plan.
j. Lead Abatement Plan (06.B.05 and specifications)	This plan is not required because no lead abatement activities are anticipated.
k. Asbestos Abatement Plan (06.B.05 and specifications)	This plan is not required because no asbestos abatement activities are anticipated.
l. Radiation Safety Program (06.E.03.a)	Encountering ionizing radiation above background is not anticipated. A Radiation Safety Program is not required. Non-ionizing radiation is addressed in SSHP Section 2.3.3.1.
m. Abrasive blasting (06.H.01)	This plan is not required because no abrasive-blasting activities are anticipated.
n. Heat/ Cold Stress Monitoring Plan (06.I.02)	SSHP Section 9

Table 8
Plans Required by EM 385-1-1

Plan, Program or Procedure	Document Location
o. Crystalline Silica Monitoring Plan (Assessment) (06.M)	This plan is not required because no work is anticipated to result in exposure to silica.
p. Night Operations Lighting Plan (07.A.08)	This plan is not required because no night operations will occur.
q. Fire Prevention Plan (09.A)	SSHP Section 10.7
r. Wild Land Fire Management Plan (09.K.01)	SSHP Section 15.7.
s. Hazardous Energy Control Plan (12.A.01)	No energy activities are anticipated.
t. Critical lift procedures (16.H)	No critical lift activities are anticipated.
u. Contingency plan for severe weather (19.A.03)	SSHP Section 10.12.5
v. Float Plan (19.F.04)	This plan is not required because no water work will be required.
w. Fall Protection Plan (Section 21.C)	This plan is not required because no work at elevation requiring a fall protection plan is anticipated.
x. Demolition Plan (engineering surveys) (23.A.01)	This plan is not required because no building demolition activities are anticipated.
y. Excavation/Trenching Plan (25.A.01)	This plan is not required because no excavation or trenching is anticipated.
z. Emergency rescue (tunneling) (26.A)	This plan is not required because no tunneling activities are anticipated.
aa. Underground Construction Fire Prevention And Protection Plan (26.D.01)	This plan is not required because no underground construction work will be done.
bb. Compressed Air Plan (26.I.01)	This plan is not required because no work under compressed air is anticipated.
cc. Formwork And Shoring Erection And Removal Plans (27.C)	This plan is not required because no shoring activities are anticipated.
dd. Pre-Cast Concrete Plan (27.D)	This plan is not required because no pre-cast concrete work is anticipated.
ee. Lift Slab Plans (27.E)	This plan is not required because no lift slab activities are anticipated.
ff. Steel Erection Plan (27.E.01)	This plan is not required because no steel erection activities are anticipated.
gg. Site Safety and Health Plan for hazardous, toxic, and radioactive waste (HTRW) work (28.B)	Addressed in SSHP (located in Attachment A of this APP).
hh. Blasting Plan (29.A.01)	This plan is not required because no blasting activities as covered by Section 29 EM385-1-1 will be conducted. Demolition of UXO is addressed in Work Plan and the ESS.

Table 8
Plans Required by EM 385-1-1

Plan, Program or Procedure	Document Location
ii. Diving Plan (30.A.13)	This plan is not required because no diving activities are anticipated.
jj. Confined space (34.A)	This plan is not required because no confined space work will be conducted.

Table 9 Activity Hazard Analysis

Date Prepared: 5/11/2012

Prepared By: Michael Stuart

Reviewed By: George Crawford, CIH

Activity 1: **Pre-Mobilization**

***Overall Risk Assessment Code (RAC):**

RAC Matrix

Hazard Severity	Accident Probability A	B	C	D	E
I	E	E	H	H	M
II	E	H	H	M	L
III	H	M	M	L	L
IV	M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Repair of existing access road, Archaeological Assessment, and Layout of new access paths.	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex2, maintained on-site by the SSHO.	L
	Biological Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP).	M
	Radiation Hazards:	Sun block will be provided to field personnel.	
	(non-ionizing only) Sun	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	M
	Physical Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	SSHO will monitor temperature by Wet Bulb Temperature Index and adjust the work/rest cycle accordingly during field operations. Personnel will have access to radios and to vehicles with air conditioning. Plenty of drinking water will be present on site and personnel will be alert to heat stress symptoms in fellow workers. .	M
	Inclement weather, heat stress	SSHO will monitor temperature by Wet Bulb Temperature Index and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	M
	Hand tools, manual and power	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. All power circuits used for hand tools will be protected by a ground fault circuit interrupter (GFCI). All personnel will be trained on the proper use of all power tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where MEC is known to exist will be vacated. Any small fire (non-MEC) may be extinguished using a properly rated extinguisher. All storage, handling and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L

Table 9 Activity Hazard Analysis

Activity 2: Mobilization

Task	Hazards	Hazard Control	RAC*
Mobilization of manpower and equipment, establishment of work zone	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP Section 3.3 and Annex 2, maintained on-site by the SSHO.	L
	Biological Hazards:	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.		M
	Radiation Hazards:	Sun block will be provided to field personnel. Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	
	(non-ionizing only) Sun		M
	Physical Hazards:	Personnel will have access to radios and to vehicles. Plenty of drinking water will be present on site and personnel will be alert to heat stress symptoms in fellow workers. .	
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.		M
	Inclement weather, heat stress	SSHO will monitor temperature by Wet Bulb Temperature Index and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	L
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Verify the path of travel is clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges and appropriate precautions shall be taken to avoid contact with rough or sharp edges. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual and power	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. All power circuits used for hand tools will be protected by a ground fault circuit interrupter (GFCI). All personnel will be trained on the proper use of all power tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where MEC is known to exist will be vacated. Any small fire (non-MEC) may be extinguished using a properly rated extinguisher. All storage, handling and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Electrical	Electrical installations for the trailer will be made by qualified electricians. The office trailer will be properly grounded.	L

Equipment	PPE	Inspection	Training
Hand tools Utility vehicles	Level D. If snakes are encountered, snake chaps will be provided to field personnel.	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and first-aid kits will be inspected by the SSHO/UXOSO.	First Aid/CPR and utility vehicle training. A minimum of a UXO Technician II will provide anomaly avoidance and UXO awareness training to non-UXO personnel.

Table 9 Activity Hazard Analysis

Activity 3: Site Preparation Activities

Task	Hazards	Hazard Control	RAC*
Site Preparation	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex 2, maintained on-site by the SSHO.	L
	Biological Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	M
	Radiation Hazards:		
	(non-ionizing only) Sun	Sun block will be provided to field personnel. Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	M
	Physical Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work will be completed in adequate natural light or sufficient artificial illumination maintained. The “buddy system” will be implemented.	M
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel will be verified clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose.	L
	Inclement weather, heat stress	SSHO will monitor temperature by Wet Bulb Temperature Index and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH (American Conference of Governmental Industrial Hygienists), National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO, operations are to cease during severe weather conditions. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	M
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage or equipment refueling area, and strategically in the work areas.	L

Equipment	PPE	Inspection	Training
Vehicles Water Truck Utility vehicles GPS Radios	Safety boots Safety glasses Hearing protection High visibility safety vest	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer’s recommendations. Records of inspection will be maintained on-site. Fire extinguishers, first-aid kits and utility vehicles will be inspected by the SSHO/UXOSO.	First Aid/CPR; and utility vehicle training. A minimum of a UXO Technician II will provide anomaly avoidance and UXO awareness training to non-UXO personnel.

Table 9 Activity Hazard Analysis

Activity 4: UXO Removal Activities

Task	Hazards	Hazard Control	RAC*
UXO technicians will conduct removal and transport of any and all potential visible MEC/MD/metallic items visible at the surface, including items protruding through the surface of the soil	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex 2, maintained on-site by the SSHO.	L
	Explosives Hazards: Unintentional detonation of MEC including rocket motors and warheads, firebomb igniters, 20mm projectiles, and .50-caliber projectiles.	Establish exclusion zones (EZ) around intrusive work for nonessential personnel based on minimum separation distances identified in the approved ESS. Maintain exclusion zones during all intrusive activities. Munitions will be positively identified prior to movement. Positively identify any fuzing associated with the munitions. If found fuzed, do not handle. If unfuzed, it may be moved to central location with approval of UXOSO and concurrence from the USACE Ordnance and Explosives Safety Specialist (OESS). UXO operations will be conducted during daylight hours only. If unknown munitions or suspected CWM is found that cannot be positively identified, the USACE OESS will be notified, the detonation will be reassessed, and the course of action verified before proceeding. Approved ESS Amendment and EM 385-1-97 will be adhered to at all times. During transport of MEC/MPPEH/MD, Paragraph I.2.E of EM 385-1-97 “TRANSPORTATION OF MM ON-SITE” will be followed to ensure safe transport. Munitions with the greatest fragmentation distance (MGFD): **Stokes Mortar Target Area:** The MGFD is the 3-inch Stokes Mortars and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 225’, the MFD for intentional detonations is 1379’ and the Team Separation Distance (K40) is 52’. **MEC Disposal Area (Burial Pit):** The MGFD is the 75mm HE Mk I projectile and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 239’, the MFD for intentional detonations is 1873’ and the Team Separation Distance (K40) is 47’. **Open Burn/Open Detonation Area:** The MGFD is the 75mm HE Mk I projectile and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 239’, the MFD for intentional detonations is 1873’ and the Team Separation Distance (K40) is 47’. **37mm Artillery/Stokes Mortar Target Area:** The MGFD is the 3 inch Stokes Mortar and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 225’, the MFD for intentional detonations is 1379’ and the Team Separation Distance (K40) is 52’. **2.36-inch Rocket Target Area near Former Sewage Lagoons:** The MGFD is the 2.36-inch rocket and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 142’, the MFD for intentional detonations is790’ and the Team Separation Distance (K40) is 37’. **Rifle Grenade Area:** The MGFD is the M9A1 Rifle Grenade and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 113’, the MFD for intentional detonations is 709’ and the Team Separation Distance (K40) is 28’. **Associated Wetlands Area:** The MGFD is the 75mm HE Mk I projectile and based on the Fragmentation Database (4/12/12) the MFD for unintentional detonations is 239’, the MFD for intentional detonations is 1873’ and the Team Separation Distance (K40) is 47’. In the event that a different ordnance item of greater hazard is found, the MGFD will be recalculated and documentation will be updated.	H
	Explosives Hazards from Demolition Operations: Intentional detonation of MEC including rocket motors and warheads, firebomb igniters, 20mm projectiles, and .50-caliber projectiles.	Before any demolition operations commence, UXO technicians assigned to or working with demolition teams will attend a site-specific orientation and training. The purpose of the orientation will be to review UXO demolition and emergency response procedures. The topics to be covered during the orientation will include, but are not limited to: review of the ESS, APP and SSHP (as applicable), sandbag mitigation requirements, review of demolition firing systems and components, review of disposal charge placement, review of explosives, transportation, site munitions brief, type and condition of UXO, EZ requirements and control, emergency response equipment, emergency procedures, two person rule, team assignments. Engineering controls will be used as prescribed in the approved ESS. Demolition notifications will be made in accordance with the work plan. Demolition Supervisor will have current AZ Blasters License. Approved ESS Amendment and EM 385-1-97 will be adhered to at all times.	H
	Biological Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	M
	Radiation Hazards:	Sun block will be provided.	
	(non-ionizing only) Sun	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	M

Table 9 Activity Hazard Analysis

Activity 4: UXO Removal Activities

Task	Hazards	Hazard Control	RAC*
UXO technicians will conduct removal and transport of any and all potential visible MEC/MD/metallic items visible at the surface, including items protruding through the surface of the soil	**Physical Hazards:**		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared from steps to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination maintained. The “buddy system” will be implemented.	M
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel will be verified clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Inclement weather, heat stress	SSHO will monitor temperature by Wet Bulb Temperature Index and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the SSHO/UXOSO, operations are to cease during severe weather conditions. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather FLD05 – Heat Stress FLD11 – Rough Terrain FLD15 – Working in a Remote Area FLD21 – Explosives	M
	Noise exposure	High noise activities will be identified. Hearing protection will be provided as appropriate. The latest ACGIH threshold limit values (TLVs) will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary.	L
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage or equipment refueling area, and strategically in the work areas.	L

Equipment	PPE	Inspection	Training
Vehicles Water Truck Hand tools Utility vehicles	Safety boots High visibility vests Gloves Safety glasses.	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer’s requirements. Records of inspections will be maintained onsite. Fire extinguishers, first aid kits, and utility vehicles will be inspected by the SSHO/UXOSO.	UXO/EOD certification, qualified in accordance with DDESB TP18, 40 hr-OSHA, 8-hr refresher, First Aid/CPR (at least 2 personnel); utility vehicle training.

Table 9 Activity Hazard Analysis

Activity 5: **Demobilization**

Task	Hazards	Hazard Control	RAC*
All equipment, materials, and personnel and temporary facilities will be removed from the site.	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex 2, maintained on-site by the SSHO.	L
	Biological Hazards:	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.		M
	Radiation Hazards:	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	
	(non-ionizing only) Sun		M
	Physical Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared from steps to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination will be maintained. Site personnel shall conduct an initial walkthrough, and the "buddy system" will be implemented.	M
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Verify the path of travel is clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges and appropriate precautions shall be taken to avoid contact with rough or sharp edges. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where UXO is known to exist will be vacated. Any small fire in an area that UXO is not present may be extinguished using a properly rated extinguisher. Storage, handling and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Inclement weather, heat stress	SSHO will monitor temperature by Wet Bulb Temperature Index and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to ACGIH and NIOSH guidelines. Personnel will be monitored. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	L
	Hand tools, manual and power	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. All power circuits used for hand tools will be protected by a GFCI. All personnel will be trained on the proper use of all power tools.	L

Equipment	PPE	Inspection	Training
Hand tools Utility vehicles	Safety boots Gloves Safety glasses	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers, first-aid kits, and vehicles utility will be inspected by the SSHO/UXOSO.	First aid/CPR and utility vehicle training.

ATTACHMENT 1
SITE-SAFETY AND HEALTH PLAN

HEALTH AND SAFETY PLAN APPROVALS

Site Name: Former Camp Bonneville Military Reservation, Remedial Action Unit (RAU) 3 Removal Action

Work Location Address: Vancouver, Washington

WORKER'S STATEMENT

I have read, understood, and agree to abide by the information set forth in the Accident Prevention Plan (APP), Site Safety and Health Plan (SSHP), and any discussions presented in the personnel health and safety briefing. I have received adequate training to perform the procedures addressed in these plans. If I identify a hazard not addressed in the APP or SSHP, or encounter an operation I cannot perform in accordance with the APP or SSHP, I will stop the process and notify my immediate supervisor.

_____ Date: _____
Andrew Caldwell

_____ Date: _____
Peter Grubb

_____ Date: _____
Glenn Haupt

_____ Date: _____
Rex Andreasen

_____ Date: _____
Nicolas Clark

_____ Date: _____
Ian Wienkamp

_____ Date: _____
Karl Christiansen

_____ Date: _____
Wesley Bain

_____ Date: _____
James Koch

_____ Date: _____
Kacy Cameron

_____ Date: _____
Gregory Cook

_____ Date: _____
Kristen Mendes

_____ Date: _____
Leonard Mendes

_____ Date: _____
Jennifer Chester

_____ Date: _____
Tiffany Dana

_____ Date: _____
Cecilia Flores

_____ Date: _____
Reida Johnson

HEALTH AND SAFETY PLAN FOR THE CONSERVATION CONVEYANCE OF CAMP BONNEVILLE

Clark County, Vancouver, Washington

I understand, agree to, and will conform to the information set forth in this Health and Safety Plan.

Name	Signature	Date

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
APP	Accident Prevention Plan
BIP	blown-in-place
CBMR	Camp Bonneville Military Reservation
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
CVF	Central Valley Floor
CVFAW	Central Valley Floor and Associated Wetlands
EHS	Environmental Health and Safety
EZ	Exclusion Zone
HAZCOM	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
MD	munitions debris
MEC	munitions and explosives of concern
mm	millimeter
MPPEH	munitions potentially presenting and explosive hazard
MSDS	Material Safety Data Sheet
OHP	Occupational Health Program
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
RAU	Remedial Action Unit
SSHP	Site Safety and Health Plan
SUXOS	Senior Unexploded Ordnance Supervisor
USACE	U.S. Army Corps of Engineers
UTV	utility vehicles
UXO	unexploded ordnance
UXOQCS	Unexploded Ordnance Quality Control Supervisor
UXOSO	Unexploded Ordnance Safety Officer
WESTON	Weston Solutions, Inc.

1. INTRODUCTION

This Site Safety and Health Plan (SSHP) provides the detailed project-specific safety and health information for the Remedial Action Unit (RAU) 3 Removal Action, former Camp Bonneville Military Reservation (CBMR), Vancouver, Washington.

The SSHP is written in accordance with all applicable Army, federal, state, and local health and safety requirements and presents the minimum requirements for safety and health that must be met by site personnel engaged in site operations. The SSHP does not in any way relieve Weston Solutions, Inc. (WESTON) site personnel or WESTON subcontractors from responsibility for the safety and health of their personnel. Visitors to the site will receive a safety briefing by the Unexploded Ordnance Safety Officer (UXOSO) prior to gaining entry to the work area. The Senior Unexploded Ordnance Supervisor (SUXOS) will provide all visitors appropriate personal protective equipment (PPE) and an escort while on-site and maintain an on-site visitor log.

Changes and modifications to the SSHP are permitted and will be made in writing with the knowledge and concurrence of the Corporate Environmental Health and Safety (EHS) Manager and accepted by Clark County Project Manager.

1.1 PROJECT DESCRIPTION

WESTON has been contracted by the Clark County Department of Public Works to support the Cleanup Action Plan effort at the CBMR. The work included under this effort involves conducting a Removal Action of suspected munitions and explosives of concern (MEC), munitions debris (MD), material potentially presenting an explosive hazard (MPPEH) at the Central Valley Floor and Associated Wetlands (CVFAW) to a depth of 14 inches below ground surface.

2. SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

2.1 SITE BACKGROUND/HISTORY

The Army used CBMR for live fire of small arms, assault weapons, artillery, and field and air defense artillery between 1910 and 1995. Since 1947, CBMR has also provided training for a variety of military and nonmilitary units from the National Guard, Reserves, U.S. Air Force, and federal, state, and local law enforcement agencies. In the early 1950s the Defense Department arranged to lease an additional 840 acres from the State of Washington Department of Natural Resources to expand training possibilities of the post. The facility has been used for weekend and summer training by the U.S. Army Reserve units in southern Washington and northern Oregon and is currently a sub-installation of Fort Lewis.

In July of 1995, CBMR was selected for closure under the 1995 Base Realignment and Closure process. Since the CBMR was officially closed, investigations have been conducted by the Army and its consultants in order to characterize the nature and extent of contamination at the site and to develop a plan for potentially transferring ownership. A Local Redevelopment Authority was initially responsible for determining cost-effectiveness and feasibility of land reuse plans for the CBMR. A land reuse plan was developed and submitted to the BOCC (Camp Bonneville Local Redevelopment Authority).

In October 2006, the Army transferred ownership of the property to Clark County via a conservation conveyance for remediation and subsequent development as a regional park. Clark County transferred ownership to the Bonneville Conservation Restoration and Renewal Team, LLC.

2.2 SITE PHYSICAL CHARACTERIZATION

The 3,840-acre CBMR site is located northeast of Vancouver, Washington, in the southeastern region of Clark County. The property is approximately five miles northeast of the corporate limits of the City of Vancouver, Washington and approximately seven miles north of the Columbia River. The CBMR is located along the western foothills of the Cascade Mountain

Range, with Camp Hill and Little Elkhorn Mountain to the northwest, Munsell Hill to the west, and Little Baldy Mountain to the south. Vehicular access to the CBMR is restricted to a single entrance from NE Pluss Road. The entrance is gated and monitored by site security and facility managers. In its last years of service as an active military base, the facility had been used for weekend and summer training by Army Reserve and National Guard components from Southern Washington and Northern Oregon and by the Federal Bureau of Investigation (FBI) and local law enforcement units. Since its closing by the U.S. Army in 1995, CBMR has not been actively used with the exception of training for FBI and local law enforcement personnel conducted at the designated FBI Firing Range.

CBMR is situated between the Cascade Mountains to the east and the Coast Range to the west. These two mountain ranges influence the local climate, which is otherwise a mild marine climate, typical of the region. The Coast Range keeps the area from feeling the full effect of the winter storms from the Pacific Ocean. The Cascade Mountains Protects the area from the strong temperature contrasts between summer and winter that occur in eastern Washington. The summers in this area are warm and dry. The winters are mild and wet, with an average of approximately 6.1 inches of rain per month during the winter months.

CBMR is situated on the margin of the western foothills of the southern Cascades in the transition zone between the Puget Trough and the Willamette Trough Provinces. The geology of this area generally consists of Eocene and Miocene volcanic and sedimentary rock types overlain by unconsolidated clays, silts, sands, and gravels of the Troutdale Formation (Phillips, 1987).

The area surrounding CBMR is sparsely populated with scattered residences and is used primarily for agriculture and livestock grazing. The nearest town is Proebstel, an unincorporated community about 2.5 miles to the southwest of the western entrance to CBMR.

The two cantonments, Camp Killpack and Camp Bonneville, are located on the valley floor. The remainder of CBMR consists of moderately steep, heavily vegetated slopes that have been used primarily as firing ranges. The valley floor is a relatively narrow floodplain, which ranges from an elevation of about 290 feet National Geodetic Vertical Datum on the western end of CBMR to about 360 feet National Geodetic Vertical Datum on the east. The adjoining slopes rise moderately steeply to elevations between approximately 1,000 and 1,500 feet National Geodetic

Vertical Datum along ridge tops within the property boundaries. The entire installation is heavily vegetated.

Former CBMR is a heavily wooded area with Douglas fir, western red cedar, western hemlock, and red alder as the dominant tree species. Depending primarily on moisture gradients, the understory is composed of salal, Oregon grape, viney maple, and sword fern (Larson, 1980 and GeoRecon International, 1981). Special-status species present at or near former CBMR include the Hairy-stemmed checker-mallow (state endangered species) and Small-flowered trillium (state sensitive species).

2.3 CONTAMINATION CHARACTERIZATION

The Final Remedial Action Unit (RAU) 3 Cleanup Action Plan stated that while the Supplemental Remedial Investigation/Feasibility Study was being conducted, numerous MEC and MD findings were reported in areas of the CBMR where such findings were not anticipated, based on the results of the Army's previous site work. These findings lead to the discovery of a number of new target impact areas and waste disposal areas. Analysis of these findings in the Supplemental Remedial Investigation/Feasibility Study led to the conclusion that additional cleanup actions are required for some areas.

Between 1909 and 1995, live and practice munitions including artillery and mortar rounds, shoulder-fired rockets, land mines (practice only), grenades, and small-arms ammunitions were stored and used on the CBMR. The CVFAW was an extensively-used target and training area. The CVFAW includes Stokes Mortar Target Area, MEC Disposal Area (Burial Pit), Open Burn/Open Demolition Area, 37-millimeter (mm) Artillery/Stokes Mortar Target Area, 2.36-inch Rocket Target Area near the former Sewage Lagoons, and Rifle Grenade Target Area. Each of these specific areas is briefly described below:

2.3.1 Stokes Mortar Target Area

The Stokes Mortar Target Area is located just south of the midpoint of the Central Valley Floor (CVF). Throughout the Stokes Mortar investigation area, multiple subsurface anomalies were identified in areas co-located with MEC on the surface that were indicative of this area being used as a target. The MEC and MD findings in the Stokes Mortar investigation area include

numerous 3-inch Stokes mortars (fired, some fuzed and some unfuzed), 2.36-inch rockets (fired, some fuzed and some unfuzed) and one 37-mm projectile (fired and fuzed), a high explosive M-9 Rifle Grenade and numerous MD findings.

2.3.2 MEC Disposal Area (Burial Pit)

The MEC disposal pit is located within a flat-lying open field in the central portion of the CVF, west of Lacamas Creek. Several layers of grenade spoons, rocket parts (some can be identified as HE rocket parts), and miscellaneous munitions-related debris were identified. The pit was not investigated vertically, but has been defined laterally. Lateral delineation of burial pit defines it as a 50 foot x 50 foot area.

The recommended cleanup action in the Final RAU 3 Cleanup Action Plan for the burial pit is complete excavation of the pit contents and proper disposal of the excavated material and implementation of ICs. This alternative was determined to be the most feasible permanent solution for this area and would achieve the RAU 3 remediation standard. The area is about 50 foot by 50 foot with an estimated depth of 10 feet for a total of approximately 4,000 cubic yards of material.

2.3.3 Open Burn/Open Demolition Area

The Open Burn/Open Demolition area is located in the southern part of the CVF on its eastern border and just north of the ESA. This demolition area covers approximately 16.33 acres and was discovered during the CVF Removal Action. Several inert 5-inch rocket warheads were identified on the surface as well as rocket slag from a thermite burn. The recent findings show the area has several subsurface anomalies indicative of additional potential MEC or MD. In addition, the area has several demolition craters indicative of past surface demolition activities. The majority of the area is located within an open flat area of the CVF. MEC and MD findings include 2.36-inch rockets (one fired, fuzed), 3-inch Stokes mortars (fired, unfuzed), a 5-inch rocket warhead, a 37-mm high explosive (unfired and unfuzed), and other miscellaneous items.

2.3.4 37-mm Artillery/Stokes Mortar Target Area

The 37-mm and Stokes mortar target area is located east of the Stokes Mortar Target Area and was identified during investigation of the CVF. The area has several subsurface anomalies co-located with MEC discovered on the surface, indicative of additional potential MEC or MD. The area was also posted with an ”Impact Area” warning sign during the brush cutting as part of the CVF Interim Action and investigation. Numerous MEC and MD items requiring demolition (3-inch Stokes mortars and 2.36-inch rockets (fired, some fuzed and some unfuzed); smoke grenades; 37-mm projectiles (fired, fuzed), were found in this area, some of the items found were high explosive type munitions.

2.3.5 2.36-inch Rocket Target Area Near Former Sewage Lagoons

The 2.36-inch Rocket Target Area is located east of the former sewage lagoon ponds in the northern part of the CVF. Based upon the density and type of findings discovered during MEC surface clearance, conducted as part of the CVF Removal Action, the area was considered a target area. MEC and MD findings included numerous 2.36-inch rockets and a smoke grenade.

2.3.6 Rifle Grenade Target Area

The Rifle Grenade Target Area is located east of former Field Small Arms Ranges 1 and 2 near or in Grid N-17. Based upon the density and type of findings the area was considered a newly discovered target area. A number of M9 rifle grenades (fired, fuzed) and MD items were recovered from an area.

2.3.7 Associated Wetlands

Wetlands extend throughout the CVF along the Lacamas Creek basin and total approximately 120 acres. Although part of the CVF, these wetlands are discussed separately due to the existence of sensitive ecological habitats, easily disturbed soils, flora and fauna, additional regulatory Agency oversight and work safety concerns (i.e. unstable saturated soil conditions and stream banks).

3. HAZARD AND RISK ANALYSIS

Field work is planned to begin in July 2012 and consists of the following project work phases/activities:

Work Phase	Work Description
Activity 1: Mobilization	– Mobilize equipment and personnel to the project site. – Establish an office trailer with utilities including electricity and communication services through the PTA provider.
Activity 2: Geophysical Survey Activities	– Construct instrument verification strip for geophysical instrument testing which includes intrusive work to bury "seed" items. – Use a licensed surveyor to locate and establish site survey control points and mark grid corners with wooden stakes and steel pins. – Perform MEC avoidance using an unexploded ordnance (UXO) Technician II or higher. – Perform digital geophysical mapping and/or analog transect and grid surveys to detect geophysical anomalies and potential MEC within the designated Munition Response Sites.
Activity 3: MEC Intrusive Activities	– Use UXO technicians to perform surface and subsurface MEC removal activities at anomaly locations. – Recover potential MEC (UXO and discarded military munitions), MPPEH, MD, and/or other non-munitions-related metal debris. – Perform subsurface removal activities by the excavation of detected anomalies using hand tools, demolition activities of recovered MEC and MPPEH, and MD and non-munitions-debris inspection and transport to a certified recycling program. – Perform demolition of MEC/MPPEH.
Activity 4: MEC/MPPEH Inspection	– Dispose of the recovered MEC and MPPEH. – Designate and segregate materials documented as safe and scrap metal for PTA turn-in and/or local recycling.
Activity 5: Drum Handling	– Drum materials documented as safe and scrap metal for PTA turn-in and/or local recycling.
Activity 6: Media Sampling	– Perform MEC avoidance using an UXO Technician II or higher. – Collect soil/sediment MC samples in locations potentially impacted by an MEC release using hand tools. – Sampling performed according to sampling plan to characterize the survey areas.
Activity 7: Demobilization	– Demobilize equipment, personnel, and site infrastructure.

3.1 ACTIVITY HAZARD ANALYSIS TABLES

Activity Hazard Analysis (AHA) tables provide a task-specific evaluation of the known or potential hazards associated with performing individual tasks within the scope of work. Each analysis also contains task-specific information related to hazard control and mitigation, including the use of specific engineering control measures, specific standard operating procedures to be implemented, and PPE to be used as required. If site conditions or work activities change, the UXOSO will evaluate the new conditions or task, and will contact the Corporate EHS Manager for assistance in developing amendments to the SSHP. Amendments made to the SSHP will be submitted to Clark County for concurrence, and all field personnel will be made aware of any changes.

Site-specific AHA tables are presented in Section 11 of the Accident Prevention Plan (APP) for each phase/activity associated with the project. Health and safety equipment such as PPE is described in Section 6 of this SSHP.

3.2 PHYSICAL HAZARDS

Exposure to physical hazards may include UXO; manual lifting; slips, trips, falls; heat/cold stress; hand tools (manual and power); terrain or vegetation; uneven walking surfaces; weather hazards, such as snow and ice; and poor visibility. Additional physical hazards common while performing brush removal activities include hands or fingers caught between objects; electrical hazards; caught in/between/struck by or against an object; and traffic.

3.3 MEC HAZARDS

Every effort will be made to identify a suspect MEC item. The MEC item will be visually examined for markings and other external features such as shape, size, and external fittings. If an unknown UXO item is encountered, the U.S. Army Corps of Engineers (USACE) representative will be notified immediately. Under no circumstances will any fused MEC be moved in an attempt to make a definitive identification. As a general rule, all fused UXO will be detonated in the original position found (blown-in-place [BIP]). This is the safest method to effect final disposition of munitions. Any item to be BIP will be sandbagged to mitigate blast effects and fragmentation projection. Only UXO personnel will handle MEC items, and only during daylight

hours. Personnel who will be handling MEC items will not wear outer or inner garments having static-electricity generating characteristics such as nylon.

WESTON and subcontractor personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards associated with MEC items. Field personnel will be under the direct supervision of a UXO Technician III or higher. General UXO safety guidelines are listed below:

- Consider projectiles containing fuses to be armed if the round is fired.
- Secure arming wires and pop out pins on unarmed fuses prior to moving UXO items.
- Do not depress plungers, turn vanes, or rotate spindles, levers, setting rings, or other external fittings on UXO items.
- Do not attempt to remove or dismantle any components of UXO items.
- UXO personnel are not authorized to render inert any UXO items found on-site.
- UXO items will not be taken from the site.
- Consider UXO items, which may have been exposed to fire and detonation, as extremely hazardous.
- Do not rely on the color-coding of UXO items for definitive identification.
- Assume that a practice UXO item contains a live charge until investigation proves otherwise.
- Do not approach a smoking munition.

3.4 CHEMICAL HAZARDS

The use of chemicals on-site during field operations creates a potential exposure of chemical hazards to personnel through inhalation, ingestion, or absorption. Site preparation and related site work may require the use of concentrated chemicals for proper equipment operation. Such chemicals may include the following:

- Diesel fuel
- Gasoline

- Propane
- Oil and grease

Site personnel will comply with the storage, handling, and use requirements stated on the Material Safety Data Sheet (MSDS) for each chemical brought on-site by WESTON or its subcontractors. All chemicals brought on-site will be properly labeled. An inventory of all chemicals brought on-site and an MSDS for each will be maintained at the site. Project subcontractors shall inform WESTON of any chemical materials brought on-site, and the location of their MSDSs. In case of conflicts between American Conference of Governmental Industrial Hygienists and other standards on the MSDS, the more stringent standard will prevail. A site-specific Hazard Communication Plan is presented in Annex 1.

3.5 BIOLOGICAL HAZARDS

Biological hazards associated with the site include mosquitoes, bees, wasps, spiders, ticks, and snakes. Snakes, spiders, ticks, and scorpions represent the highest potential biological hazards that may be encountered during the field activities. The risk of exposure to these hazards may be high during the late spring and summer. Personnel will be briefed regarding the site-specific biological hazards. WESTON Field Operating Procedure (FLD) 043 addresses biological hazards and protective protocols. A copy of this FLD is provided in Annex 2. Site personnel will be instructed to be alert for and avoid wild animals, to wear long pants and shirts while working in brush, and to use insect repellent as well as poison-ivy block and cleanser. Any site worker who is knowingly allergic to insect bites will be required to inform the UXOSO, and to carry an allergy response kit. First-aid providers will also be required to know how to use the response kit.

3.6 RADIATION

Based on review of existing information, exposure to sources or contamination of ionizing radiation is not expected to be encountered.

3.6.1 Non-Ionizing Radiation

The most likely exposure to non-ionizing radiation is the sun. Personnel will receive instruction in using appropriate PPE and/or procedures to follow in the event that non-ionizing radiation creates a concern and requires the use of sunscreen and hats.

4. STAFF ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

WESTON is ultimately responsible for the implementation of the health and safety program, APP and SSHP. Personnel having the potential for exposure to site hazards are subject to the requirements of this SSHP. Work shall not be performed in a manner that conflicts with the health, safety, or environmental precautions outlined in the APP or this SSHP. Personnel violating safety procedures are subject to dismissal from the project site.

Roles and responsibilities for key safety and project personnel are provided in Table 1. The roles and responsibilities for key site-specific personnel are provided in Table 2.

4.1 PERSONNEL ASSIGNED TO THE PROJECT

WESTON and subcontractor personnel, including UXO Technicians I, II, and III, who will perform work on-site, are responsible for the following:

- Taking all reasonable precautions to prevent injury to themselves and to their fellow employees, and being alert to potentially harmful situations.
- Performing only those tasks that they believe they can do safely and have been trained to do.
- Notifying the UXOSO of any special medical conditions (i.e., allergies, contact lenses, diabetes).
- Notifying the UXOSO of any prescription and/or nonprescription medication, which the worker may be taking, that might cause drowsiness, anxiety, or other unfavorable side effects.
- Preventing spillage and splashing of materials to the greatest extent possible.
- Practicing good housekeeping by keeping the work area neat, clean, and orderly.
- Immediately reporting all injuries to the UXOSO.
- Complying with the SSHP and all safety and health recommendations and precautions, and properly using PPE as determined by the SSHP and/or the UXOSO.

4.2 COMPETENT PERSON

According to Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1926.32, site personnel will include a Competent Person**. No work shall be performed without a Competent Person on-site.** A list of competent person requirements and regulatory references is provided in Table 3. Mr.Schneider meets these requirements and has been approved by WESTON's Corporate EHS Manager.

Mr. Schneider is a competent person as stated in OSHA 29 CFR 1926.32. As required by EM 385-1-1, Mr. Schneider has at least 5 years of applicable safety experience and has successfully completed the OSHA 30-hour construction safety course (or equivalent course). Mr. Schneider has performed work on a site(s) of similar hazard, risk, and complexity to the task assignment, and is certified in first aid and cardiopulmonary resuscitation (CPR). Mr. Schneider also has at least five years of experience implementing safety and occupational health procedures and experience conducting exposure monitoring to select and adjust PPE; however, it is unlikely that such adjustments will be needed.

The qualifications of all site-specific personnel will be maintained at the CVFAW project office. The certifications and overall qualifications of all WESTON personnel are maintained in a database supported by WESTON.

4.3 QUALIFIED PERSON

Site personnel will also include a Qualified Person. WESTON will permit only those employees qualified by training or experience to conduct UXO operations, or operate equipment and machinery in compliance with OSHA 29 CFR 1926.20(b)(4). According to OSHA 29 CFR 1926.32, "qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project. Table 4 provides the qualified person's requirement list.

The SUXOS, UXOSO, Unexploded Ordnance Quality Control Supervisor (UXOQCS), and UXO Technicians III, II, and I will meet the requirements of the Department of Defense Explosive Safety Board Technical Paper (TP) 18 for the positions assigned.

The qualifications of all site-specific personnel will be maintained on-site. The certifications and overall qualifications of all WESTON personnel are maintained in a database supported by WESTON. Documentation will be reviewed and maintained by the UXOSO.

4.4 WESTON SUBCONTRACTORS

- B&B Brush Clearing, LLC for brush clearing support;
- PBS Engineering & Environmental for natural resource management support;
- Pioneer Technologies Inc., for consulting regarding lead-impacted soils; and
- Minister & Glaeser Surveying, Inc for all professional survey work.

4.4.1 Controlling and Coordination of Subcontractors and Suppliers

WESTON is ultimately responsible for assuring subcontractor compliance with the health and safety requirements as outlined in the APP and SSHP for CVFAW. Non-compliance with this plan will result in a stop work order, as determined by the UXOSO.

4.4.2 Safety and Responsibilities of Subcontractors and Suppliers

The UXOSO will ensure compliance with this SSHP. Subcontractor employees are expected to comply with this SSHP, the APP, USACE EM 385-1-1, and other applicable regulations governing their safety while on the project. In the event of a conflict, the more stringent requirements will apply. The Site Safety Representative will:

- Attend all health and safety briefings.
- Address worker issues and immediately stop work if unsafe acts/conditions exist or if uncertainty associated with how a task is to be performed exists.
- Coordinate corrective action with the UXOSO prior to resuming operations.
- Participate in any incident investigations.
- Inspect operations and work areas daily, in conjunction with the UXOSO.
- Ensure subcontract workers have the proper PPE.
- Control all hazardous material brought on-site.

4.4.3 Subcontractor Safety Plans

WESTON subcontractors are covered by this APP and SSHP and will be required to sign the Acknowledgement Form in the SSHP indicating that they have read and understand both the APP and the SSHP, and agree to follow all of its requirements.

WESTON will obtain and verify the subcontractor personnel training records prior to work commencing.

5. TRAINING

Personnel assigned to or regularly entering a project site will have received the required training. A record of this training is maintained in the WESTON Corporate (EHS) database. As required by EM 385-1-1 and in accordance with 29 CFR 1910.120, elements of CFR 1926, and other OSHA regulations, applicable required training for all site workers will be in accordance with the following sections. Training certificates for key WESTON safety personnel are included in Attachment G of the APP. If training is not current, employees will not be allowed to work or supervise at the site until they have successfully completed training requirements.

A daily discussion will be conducted to review activities associated with daily tasks. All field personnel will participate in these documented discussions.

5.1 NEW HIRE SAFETY ORIENTATION AND INDOCTRINATION

New employees participate in WESTON's orientation program. All personnel receive training on WESTON's EHS policy including environmental aspects, Behavior-Based Safety, and site-specific/job-specific training. New employees will not be permitted to work at any site until they have received proper project training for their specific role. Training will include the following site- specific topics:

- Accident prevention
- Accident reporting (how and to whom)
- Medical facilities for emergency treatment and/or assistance

- Reporting and correcting unsafe conditions
- Job hazards/hazard control
- Site-specific biological, physical, chemical, and or ionizing/non-ionizing radiation hazards as listed in the Activity Hazard Analyses
- Site-specific UXO and demolition procedures
- Company safety policies
- Site briefings conducted prior to being granted site access
- Site layout
- Hazard control
- Emergency response and notification
- Hearing conservation
- PPE
- Buddy system
- Spills
- Fires
- Hazard communication
- Visitor access
- Any specific training required by regulations

Note: The SSHP will be provided to all employees for review and signature prior to work.

5.2 UXO PERSONNEL TRAINING

All UXO technicians and personnel will meet the minimum training requirements of Department of Defense Explosive Safety Board TP-18.

5.3 OSHA HAZWOPER TRAINING

General site workers will attend the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and have 3 days of field experience under the direct supervision of a trained, experienced supervisor. On-site management personnel (MEC Response and Removal Task Manager and/or UXOSO) will have an additional 8 hours of specialized supervisory training. All workers must have initial training completed or refresher training (8 hours) within the past 12 months. All training is documented.

5.4 OSHA 30-HOUR CONSTRUCTION TRAINING

In compliance with USACE Health and Safety Requirements Manual (EM 385-1-1), 15 September 2008, the UXOSO, at a minimum, will have completed the 30-hour OSHA construction safety class or equivalent training, and complete a minimum of 24 hours of formal safety course work every 4 years.

5.5 FIRST AID AND CPR TRAINING

At least two employees or subcontractors at the site will be currently certified in first aid and CPR. The training shall be equivalent to that provided by the American Red Cross.

5.6 BLOOD-BORNE PATHOGEN TRAINING

Personnel trained in first aid and expected to administer first aid will receive training in controlling exposures to blood-borne pathogens. This training will address the following topics:

- The blood borne pathogen standards
- Requirements of the Exposure Control Plan
- Description of the risks of exposure and how blood-borne pathogens are transmitted
- Management and employee responsibilities
- Protection methods against exposure and decontamination procedures
- Post-exposure procedures
- Labeling and color-coding of infectious waste

5.7 HAZARD COMMUNICATION TRAINING

Hazard communication training will include discussion of the following topics:

- Potential safety/health effects of exposure to chemicals used (e.g., gasoline/diesel)
- Labeling of containers
- Current inventory of hazardous chemicals
- Location/use of MSDS
- Procedures to inform employee when new chemical is brought on-site
- Current quantities of hazardous chemicals
- Location of chemical on-site

5.8 PROJECT SITE-SPECIFIC SAFETY AND HEALTH TRAINING

Project site-specific training will be provided to workers prior to on-site operations. This training will include the following:

- Training specific to other sections of EM 385-1-1 or OSHA standards in 29 CFR 1910 and 29 CFR 1926 that are applicable to site operations.
- Training covering each element in the SSHP.

5.8.1 Chemical and Physical Hazard Training

Site-specific health and safety training will be conducted prior to field activities at the site. In particular, the training will stress emergency response procedures and will cover the chemical and physical hazards of the site and site operations.

The UXOSO will be required to document that personnel have read and thoroughly understand the information contained in the AHA.

5.8.2 Site-Specific UXO Procedures Training

UXO personnel will receive training on the site specific UXO and demolition procedures as described in the Explosive Safety Submission.

5.8.3 Hearing Conservation Training

Site personnel exposed to noise levels exceeding 85 A-weighted decibels over an 8-hour time-weighted average will be provided with training, which addresses the following topics:

- Physical and psychological effects of high noise exposure
- Noise exposure limits
- Elements of the Hearing Conservation Program
- Selection, use, and limitations of hearing protection devices

Sources of noise potentially above 85 A-weighted decibels at the site include chainsaw operations.

5.8.4 Instrument Calibration Training

It is not anticipated that real-time air-monitoring equipment will be used on-site based on the risk assessment and hazard characterization.

UXO technicians will receive training on the use and procedures for functionality and quality control testing of all UXO survey instruments used on-site.

5.8.5 Buddy System Training

All work will be performed using the buddy system. Team members will keep in visual contact with each other at all times. Team members will be made aware of any slip, trip, and lifting hazards along with heat or cold stress, and general hazards within their work area.

5.8.6 Periodic Safety and Health Training

The UXOSO will present daily site safety briefings (i.e., tailgate meetings) to on-site personnel prior to the start of the work shift. The purpose of the briefings is to assist personnel in safely conducting the scheduled work activities. The briefings will include the following:

Tasks to be performed, work method and general description of job scope.

- Work location

- Equipment usage
- Control of hazards
- Weather conditions
- Emergency response review

The briefings provide an opportunity for individuals to share observed safety deficiencies and recognitions. Attendance at these daily safety briefings is mandatory and will be documented by the UXOSO.

In addition to the daily site safety briefing, a formal safety meeting will be conducted at least monthly for all UXOSO within their respective divisions. A safety manager or designee will be invited to lead this monthly meeting.

5.8.7 Emergency Response Training

WESTON provides training by the American Red Cross, or equivalent organization in both Standard First Aid and Adult CPR for all the field staff. At least two WESTON personnel with such training, and also trained in the use of fire extinguishers, will be on-site to provide emergency response. In the event specialized/elevated care is necessary, either WESTON or the on-call emergency medical technician/ambulance service will transport the injured person to the appropriate medical facility.

Outside assistance will be requested as detailed in the Emergency Response Plans included in the SSHP.

All WESTON personnel involved with responding to an on-site emergency will be briefed in their roles and responsibilities as part of the initial indoctrination training discussed above. During this training, personnel will be briefed on the Hazard Communication (HAZCOM) Program, emergency equipment, and first-aid procedures, as described in the SSHP. Personnel will also be briefed on emergency response and contingency procedures presented in Section 10 of the SSHP, which include the following:

- Procedures and tests
- Spill prevention

- Firefighting
- Posting of emergency telephone numbers
- Medical support

5.8.8 Visitor Training

Visitors will receive site-specific training to ensure that potential hazards and risks are identified. This training will consist of a safety briefing by the UXOSO that will include the following:

- Location and description of potential hazards and risks
- Required PPE
- Areas of the site that are closed to visitors
- The site evacuation plan and emergency procedures
- Other topics as deemed appropriate

5.8.9 Utility Vehicle Use and Training

Operators of utility vehicles (UTVs) must receive specific training before being permitted to use UTVs. Training will be conducted in accordance with appropriate manufacturer recommendations and will be documented.

6. PERSONAL PROTECTIVE EQUIPMENT

PPE to be used for this work is described below. Personnel performing operations on-site shall be required to use the appropriate level of protection. The minimum level of protection required to begin each activity of this project is shown in listed below.

The effectiveness of the PPE program will be evaluated by the UXOSO. If additional hazards are identified requiring a higher level of protection and changes to the program are necessary, the UXOSO will inform the Corporate EHS Manager and amend the PPE requirements.

Work Phase	**Level of PPE Protection**
Activity 1: Mobilization	Level D
Activity 2: Geophysical Survey Activities	Level D
Activity 3: MEC Intrusive Activities	Level D
Activity 4: MEC/MPPEH Inspection	Level D
Activity 5: Drum Handling	Level D
Activity 6: Demobilization	Level D

In accordance with OSHA 29 CFR 1910, Subpart I, PPE will be provided, used, and maintained in a sanitary and reliable condition. All PPE will be of the construction, design, and material to provide employees with protection against known or anticipated hazards. PPE will be selected that properly and appropriately fits the employee. WESTON employees have received OSHA-compliant training. Any concerns regarding the use of appropriate PPE will be brought to the attention of the UXOSO, who will contact the Corporate EHS Manager for assistance in evaluation of PPE as necessary.

Level D or Modified Level D PPE is required for this project. The UXOSO will review the following criteria with employees:

- Proper selection

- When PPE is anticipated for use
- Proper uses and limitations of equipment during temperature extremes, heat/cold stress, and employee medical limitations
- Proper donning and doffing, and adjusting
- Maintenance, cleaning, and storage
- Inspection procedures

6.1 LEVEL D PERSONAL PROTECTIVE EQUIPMENT

Level D PPE consists of:

- Work clothes such as coveralls, long pants, and shirts with sleeves
- Clothing under coveralls
- Work gloves—leather or cotton as necessary for physical hazards
- Boots that provide adequate ankle protection
- American National Standard Institute (ANSI) compliant safety glasses, safety goggles and face shields as necessary
- ANSI-compliant hard hat (required when staff are working around heavy equipment)
- Helmets, as necessary (e.g., utility vehicle [UTV] operation)
- Hearing protection, as necessary

6.2 MODIFIED LEVEL D PERSONAL PROTECTION EQUIPMENT

Modified Level D PPE may consist of:

- Work clothes such as coveralls, long pants, and shirts with sleeves
- Gloves, nitrile chemical-resistant
- Safety boots, ANSI-compliant
- Safety glasses, ANSI-compliant or safety goggles (as necessary)

7. MEDICAL SURVEILLANCE

7.1 MEDICAL SUPPORT FUNCTIONS

Since 1980, WESTON has utilized a comprehensive Occupational Health Program (OHP) that complies with all OSHA and USACE requirements. All site personnel and subcontractors who enter the site while operations are being conducted must comply with a comparable OHP. All medical records are maintained in accordance with 29 CFR 1910.1020. If any unforeseen hazard becomes evident during the performance of work, the UXOSO shall bring such hazard information to the attention of the Corporate EHS Manager and the USACE Project Manager both verbally and in writing for resolution as soon as possible. In the interim, the necessary action will be taken to reestablish and maintain safe working conditions.

Medical certifications for site personnel listed in Section 4 are included in the Attachment 7 of the APP. Additional personnel certifications will be maintained on-site and available for review.

7.1.1 Occupational Health Program

To comply with OSHA requirements, WESTON has designated Dr. Peter Greaney of WorkCare to oversee the site-specific medical surveillance and OHP. Dr. Greaney is a board-certified physician in internal and occupational medicine. Dr. Greaney can be reached during regular business hours at (800) 455-6155.

The purpose of the OHP is to ensure suitable job placement of employees, to monitor the health effects of hazards encountered in the workplace, and to maintain and promote good health through preventive measures. Medical examination criteria are established by WorkCare in compliance with 29 CFR 1910.120.

Occupational Health Services

WESTON provides occupational health services (OHS) for its employees, which includes the following:

- Initial and Periodic Medical Testing and Certification—Upon assignment to field work and periodically, generally annually, as appropriate and determined by WESTON's

Medical Director, WESTON employees will be examined by qualified medical facilities and certified as able to work on hazardous sites and to wear respiratory protection. Copies of certifications will be maintained by the UXOSO. Subcontractors are required to provide certifications proving employees have medical clearance to work at a hazardous waste site.

- Termination Examination—Upon termination of employment, WESTON personnel who have worked continuously at a hazardous waste project site for more than 6 months will be given the opportunity to undergo a termination examination equivalent to the baseline health assessment. All personnel who terminate employment within a 6-month period will undergo an examination based upon their exposure at the site. The physician will determine specific examination tests.
- Supplemental Examination—Any worker receiving a potentially harmful level of exposure to hazardous chemical/biological material or exhibiting signs or symptoms of possible exposure will undergo a supplemental examination. The physician will certify in writing that the employee is fit to return to work. If necessary, activity restrictions will also be specified in writing. Additional tests will be conducted if contaminants/potential exposures so dictate and will be determined by the examining physician.

Health Care Administrative Services

Medical records will be established and maintained by WorkCare in support of the WESTON Medical Monitoring Program. These records will be treated as private and confidential information and will be complete enough to provide data for use in health maintenance, treatment, and epidemiologic studies, and in helping WESTON with program evaluation and improvement. The medical record will contain sufficient information to identify the patient, support the diagnosis, justify the treatment, and document additional follow-up treatment or referrals. The physician's written opinion for all medical examinations will be as specified in 29 CFR 1910.120, Subpart (f)(7).

8. EXPOSURE MONITORING/AIR SAMPLING

Based on the hazard/risk assessment of the site, the nature of the work, and previous experience performing UXO operations at the CVFAW site , it is not expected that any airborne contaminants or nuisance dust level exposure limits will be exceeded. As a result, no air monitoring or air sampling will be performed. If conditions change, the AHAs and SSHP will be amended. Subsequently, WESTON would perform required monitoring to evaluate the effectiveness of prescribed PPE and evaluate potential work exposure. Any amendment to the plan will be reviewed and approved by the Corporate ESH Manager and accepted by Clark County.

9. HEAT AND COLD STRESS/WEATHER

9.1 WEATHER HAZARDS

In the event of unseasonably warm weather, personnel should be closely monitored for signs of heat stress or heat stroke, particularly whether PPE is required. During cold weather, it may be necessary to protect personnel from the effects of cold temperatures and wind, as well as wetting from precipitation. The UXOSO is responsible for evaluating the conditions, work tasks, and requirements for PPE, and for implementing the emergency response procedures.

9.2 LIGHTNING

Prior to working in areas or beginning projects when or where there is an increased potential for lightning striking personnel, steps must be taken to predict the occurrence of lightning strikes. Recommendations include the following:

- Check with Clark County Public Works management to determine whether there are any patterns or noted conditions that can help predict lightning or whether there are structures that are prone to lightning strikes.
- Arrange for Clark County Public Works notification when there is the increased potential for lightning activities.
- Ensure that Clark County Public Works includes WESTON workers in lightning contingency plans.
- Monitor weather reports.
- Note weather changes and conditions that produce lightning.
- Stop work in open areas, around structures that may attract lightning, on or in water and in elevated work places when lightning strikes are sighted or thunder is heard near a work site.
- Ensure all personnel are provided with safe areas of refuge. Prevent personnel from standing in open areas or under lone trees.

- Observe the "30-30" Rule. If you see lightning and thunder is heard within 30 seconds (approximately 6 miles), seek shelter. If you hear thunder, but do not see lightning, you can assume that lightning is within 6 miles and you should seek shelter. Remain in the sheltered location for 30 minutes following the last lightning strike.

9.3 HIGH WINDS

- Stay Informed: Keep up-to-date with the latest local weather reports. Visit weatherbug.com or weather.gov to stay informed in case of wind warnings, watches, and advisories. Use daily hazard assessments to determine whether working conditions have changed or will change throughout the day.
- Be Prepared: When you know the weather will be windy, secure loose supplies that could be picked up or torn loose by strong winds and thrown onto surrounding streets, structures, vehicles, or bystanders.
- Know the Limits of Your Equipment: When operating equipment, take time to read the operator's manual and become familiar with the wind specifications. Many manufacturers have high-wind guidelines to prevent you from operating in unsafe weather. You should also check safety equipment to determine whether it is adequate for windy conditions.
- Work Safely: If you will be working on a windy day, you should be alert and protected. Wear eye protection to prevent dust and other particles from entering or striking your eyes.
- To avoid flying debris and to minimize damage during high winds, do the following:
  - Shut down outdoor activities when wind speeds exceed 40 miles per hour or as indicated by Equipment Manufacturer's Instructions; including work with toxic materials that could be dispersed by the winds. Move mobile items stored outside to indoor storage.
  - Secure any items that cannot be moved inside.
  - Be careful opening exterior doors.
  - Increase separation distance from overhead power lines.
  - Be cautious about downed power lines, tree limbs, and debris on roads.

9.4 HEAT STRESS

One of the most common types of stress that can affect field personnel is heat stress. In addition, heat stress can be a serious hazard to workers at waste sites because of the PPE required. Signs and symptoms, monitoring requirements, and prevention and treatment procedures for heat rash, heat cramps, heat exhaustion, and heat stroke are presented below. Monitoring requirements and prevention and treatment procedures will be followed at all times. The UXOSO will conduct heat stress monitoring. Workers shall be briefed and cognizant of heat and cold stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to American Conference of Governmental Industrial Hygienists and National Institute for Occupational Safety and Health guidelines.

9.4.1 Heat Stress Symptoms and Treatment

Heat Rash

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation and is aggravated by chafing clothes. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a worker's performance.

Symptoms—Mild red rash, especially in areas of the body that come into contact with protective gear.

Treatment—Decrease amount of time spent working in protective gear and provide body powder to help absorb moisture and decrease chafing. Heat rash can be prevented by showering, resting in a cool place, and allowing the skin to dry.

Heat Cramps

Heat cramps are caused by inadequate electrolyte intake. The individual may be receiving adequate water; however, if not combined with an adequate supply of electrolytes, the blood can thin to the point where it seeps into the active muscle tissue, causing cramping.

Symptoms—Acute painful spasms of voluntary muscles, most notably the abdomen and extremities.

Treatment—Move the victim to a cool area and loosen clothing. Have the victim drink 1 to 2 cups of cool potable water or diluted commercial electrolyte solution (e.g., Gatorade, Quench) immediately, and then every 20 minutes thereafter until symptoms subside. Electrolyte supplements can enhance recovery; however, it is best to double the amount of water required by the dry mix package directions or add water to the liquid form.

Heat Exhaustion

Heat exhaustion is a state of weakness or exhaustion caused by the loss of fluids from the body. Heat exhaustion is not as dangerous as heat stroke, but if not properly managed in the field, it may lead to heat stroke.

Symptoms—Pale, clammy, and moist skin, profuse perspiring, and extreme weakness. Body temperature is normal, pulse is weak and rapid, and breathing is shallow. The person may have a headache, may vomit, may feel dizzy, and may be irritable or confused.

Treatment—Move the victim to a cool, air-conditioned or temperature-controlled area, loosen clothing, place in a position with the head lower than the feet (shock prevention), and allow the victim to rest. Consult a physician. Ensure that the victim is not nauseated or vomiting. If not nauseated or vomiting, give the victim small sips of cool water or diluted electrolyte replenishment solution (one to one dilution with water, or if mixing from powder, double the water added). If this is tolerated, have the victim drink 1 to 2 cups of fluid immediately, and every 20 minutes thereafter until symptoms subside. Seek medical attention at the advice of the consulting physician.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the body's heat regulating mechanisms, i.e., the individual's temperature control system (sweating) stops working correctly. Body temperature rises so high that brain damage and death may result if the person is not cooled quickly.

Symptoms—Red, hot, dry skin (although the person may have been sweating earlier); nausea, dizziness, confusion, extremely high body temperature (i.e., 104 degree Fahrenheit [°F] or

greater as measured with an oral thermometer), rapid respiratory and pulse rate, seizures or convulsions, unconsciousness or coma.

Treatment—Immediately call for emergency medical assistance. Remove the victim from the source of heat and cool the victim quickly. If the body temperature is not brought down quickly, permanent brain damage or death may result. Remove all PPE and as much personal clothing as decency permits. Fan the person while sponging or spraying with cool or tepid water. Apply ice packs (if available) to the back of the neck, armpits, groin area, or behind the knees. Place the victim flat on their back or with head and shoulders slightly elevated. If conscious, and not nauseated or vomiting, the victim may be provided sips of cool water. Do not give the victim coffee, tea, or alcoholic beverages. Emergency medical personnel will take over treatment when they arrive.

9.4.2 Heat Stress Prevention

The following measures should be followed to prevent heat stress:

- The most important measure to prevent heat-related illness is adequate fluid intake.
- Workers should drink 1/2 to 1 quarts of liquids per hour in high heat conditions. Most of this liquid should be water.
- Provide a shaded area for rest breaks.
- Ensure that adequate shelter is available to protect personnel against heat and direct sunlight. When possible, shade the work area.
- Discourage the intake of caffeinated drinks during working hours.
- Monitor for signs of heat stress.
- Encourage workers to maintain a good diet during these periods. In most cases, a balanced diet and lightly salted foods should help maintain the body's electrolyte balance. Bananas are especially good for maintaining the body's potassium level.
- If utilizing commercial electrolyte mixes, double the amount of water called for in the package directions. Indications are that "full-strength" preparations taken under high heat stress conditions may actually decrease the body's electrolytes.

- Acclimate workers to site work conditions by slowly increasing workloads (i.e., do not begin work activities with extremely demanding tasks).
- Encourage workers to wear lightweight, light-colored, loose-fitting clothing.
- In extremely hot weather, conduct field activities in the early morning and evening.
- Good hygienic standards must be maintained by frequent showering and changes of clothing.
- Clothing should be permitted to dry during rest periods.

9.4.3 Heat Stress Monitoring and Work Cycle Management

When strenuous field activities are part of ongoing site work conducted in hot weather, the following guidelines should be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. These procedures should be instituted when the temperature exceeds 70 ºF and the tasks/risk analysis indicates an increased risk of heat stress problems. Consult the safety professional (e.g., Division and or Corporate Environmental, Health and Safety, and the UXOSO) if questions arise as to the need for specific heat stress monitoring. In all cases, the site personnel must be aware of the signs and symptoms of heat stress and provide adequate rest breaks and proper aid as necessary. The UXOSO will conduct heat stress monitoring. The UXOSO will use a tympanic thermometer as well as a standard thermometer for body and ambient temperature respectively.

NOTE: For purposes of this operating practice, a break is defined as a 15-minute period. A physiological monitoring schedule is determined by following the steps below:

- Measure the air temperature with a standard thermometer.
- Estimate the percent of sunshine by judging what percent the sun is out (refer to Table 5).
- Calculate the adjusted temperature based on the following formula:
- Adjusted Temperature = Actual Temperature + 13 X (where X = sunshine fraction from Table 5)
- Using Table 6, determine the physiological monitoring schedule for fit and acclimated workers for the calculated adjusted temperature.

The length of the work period is governed by the frequency of physiological monitoring (Table 6). The length of the work period is governed by physiological parameters (heart rate and oral temperature). As noted above, the rest period will be set at 15 minute durations. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period. Oral temperature can be checked with a clinical thermometer after work but before the employee drinks water. If the oral temperature taken under the tongue exceeds 99.7 °F, shorten the next work cycle by one third. These adjustments of the work period based on heart rate and oral temperature were recommended in OSHA Technical Manual TED 01-00-015, January 1999, Section III: Chapter 4, Heat Stress.

9.4.4 COLD STRESS

In the planning stages of a project, the potential for cold-related hazards must be considered in the site-specific SSHP and during risk assessment. The UXOSO must make decisions on the proper safety procedures and recommend them to the Site Manager. Each worker must evaluate the risk associated with his or her work and be actively alert to these hazards. Any site worker may stop work if safety procedures are not followed or the risk is too great. Personnel working outdoors are subject to cold stress at temperatures below 40 °F. Exposure to extreme cold can cause skin injury or death if the core body temperature is unchecked and permitted to drop. Chemical-protective clothing does not provide protection against cold stress and may increase susceptibility. Signs and symptoms, monitoring requirements, and prevention and treatment procedures for cold stress are presented below. Monitoring requirements and prevention and treatment procedures will be followed at all times.

Cold Stress Symptoms and Treatment

The UXOSO must make decisions on the proper clothing for the weather. Each worker must evaluate the risk associated with his or her work activity in relation to the weather. Any site worker may stop work if safety procedures are not followed or severe conditions warrant. Personnel working outdoors are subject to cold stress at temperatures below 40 °F. Exposure to extreme cold can cause skin injury or death if the core body temperature is unchecked and permitted to drop. Chemical-protective clothing does not provide protection against cold stress

and may increase susceptibility. The following subsections describe the signs and symptoms, monitoring requirements, prevention and treatment procedures for cold stress. These requirements and procedures will be followed at all times.

Frostbite

Frostbite is the freezing of tissue and most commonly affects the toes, ears, fingers, and face. Frostbite occurs when an extremity loses heat faster than it can be replaced by the circulating blood. Frostbite may result from direct exposure to extreme cold or cool, high wind. Damp socks and shoes may contribute to frostbite of the toes.

Symptoms—Cold, tingling, aching, or stinging feeling followed by numbness; skin color is red, purple, white, or very pale and is cold to the touch; blisters may be present (in severe cases).

Treatment—Call for emergency medical assistance; move the affected person indoors and/or away from additional exposure to cold, wet, and wind. Wrap the affected area in a soft, clean cloth (sterile, if available). Provide a warm beverage such as water or juices (not coffee, tea, or alcohol). Do not allow the person to smoke. Do not rub the frostbitten part (this may cause gangrene). Do not use ice, snow, gasoline, or anything cold on the frostbitten area. Do not use heat lamps or hot water bottles to rewarm the frostbitten area. Do not place the frostbitten area near a hot stove. Do not break blisters. After rewarming, elevate the area and protect it from further injury.

Hypothermia

Hypothermia means “low heat” and is a potentially serious condition. Systemic hypothermia occurs when body heat loss exceeds body heat gain and the body core temperature falls below the normal 98.6 °F. Although some hypothermia cases are caused by extremely cold temperatures, most cases develop in air temperatures between 30 and 50 °F, especially when compounded with water immersion and/or windy conditions. The victim of hypothermia may not know, or refuse to admit, that he or she is experiencing hypothermia. All personnel must be observant for these signs for themselves and for other team members.

Symptoms—Cool, bluish skin; uncontrollable shivering; vague, slow, slurred speech; irritable, irrational, or confused behavior; memory lapses; clumsy movements, fumbling hands; fatigue or drowsiness.

Below the critical body core temperature of 95 °F, the body cannot produce enough heat by itself to recover. At this point, emergency measures must be taken to reverse the drop in core temperature. The victim may slip into unconsciousness and can die in less than two hours after the first signs of hypothermia are detected. Treatment and medical assistance are critical.

Treatment—Call for emergency medical assistance. Do not leave the victim unattended. Prevent further heat loss by moving the person to a warmer location out of the wind, wet, and cold. Remove cold, wet clothing and replace with warm, dry clothing or wrap the victim in blankets. If the victim is conscious, provide warm liquids, candy, or sweetened foods. Carbohydrates are the food most quickly transformed into heat and energy. Do not give the victim alcohol or caffeine. Have the person move his/her arms and legs to create muscle heat. If the person is unable to move, place warm bottles or hot packs in the armpits, groin, neck, and head. Do not rub the arms and legs, and do not place the person in warm water.

9.4.5 Prevention and Protection

The following general guidelines are recommended for preventing or minimizing cold stress:

- Wear loose, layered clothing, masks, woolen scarves, and hats. Wear liners under hard hats (if required).
- Protect hands with gloves or mittens.
- Never touch cold metal with bare hands.
- Wear waterproof, slip-resistant, insulated boots.
- Use chemical foot and hand warmers (commercially available) inside boots and gloves.
- In extreme cold, cover the mouth and nose with wool or fur to “pre-warm” the air you breathe.
- If you are wearing a face protector, remove it periodically to check for frostbite.

- Ensure that clothing remains secure around the body, especially at the neck and waist.
- If required to wear chemical-protective clothing, remember that it generally does not afford protection against cold stress. In many instances, chemical-protective clothing increases susceptibility. Dress carefully if both chemical protection and thermal insulation are required.
- Remove outer layers to avoid overheating and soaking clothing with perspiration; replace layers to avoid becoming chilled.
- Keep clothes dry by wearing water-resistant and wind-resistant clothing and outerwear.
- Wear clothing that will "breathe" or allow water vapor to escape.
- Eat well-balanced meals, ensure adequate intake of liquids, and avoid alcoholic beverages. Eat soup and drink warm, sweetened beverages. Because of their diuretic and circulatory effects, limit beverages containing caffeine.
- Utilize available warm shelters and implement work-rest schedules.
- If warm shelters are not available, use cars/vehicles as shelter from the cold. (Ensure that tailpipes are not covered by heavy snowfall).
- Use radiant heaters to provide warmth (if using propane heaters ensure adequate ventilation to avoid carbon monoxide poisoning).
- Monitor yourself and others for changes in physical and mental condition.
- Use the buddy system or supervision to ensure constant protective observation.
- If heavy work must be done, resulting in sweating/wet clothing, take rest periods in heated shelters and change into dry clothing as necessary.
- New employees should not work full-time in the cold during the first days of employment until they become accustomed to the working conditions and the use of required protective clothing.
- Include the weight and bulkiness of clothing in estimating the required work performance and weights to be lifted by the worker.

- Arrange the work in such a way that sitting or standing still for long periods is minimized.
- Perform work protected from drafts to the greatest extent possible. If possible, shield the work area from wind.

Tables 7 and 8 should be consulted to adjust working schedules for wind chill conditions based on equivalent chill temperature. These tables are guidelines only; ambient temperatures and wind conditions should be monitored frequently and work schedules adjusted as required. If workers show signs or symptoms of cold stress, the work schedule must be adjusted, as required.

9.4.6 Work/Warming Regimen

Work should be performed in the warmest part of the day. If work is performed continuously in the cold or winter conditions or where rain or cool winds are expected, provide heated warming shelters, tents, cabins, or break rooms nearby. Encourage workers to use the shelter at regular intervals depending on the severity of the cold exposure. Table 8, Cold Work/Warmup Schedule for 4-Hour Shifts, provides guidance for working in severe cold weather. The onset of heavy shivering, the feeling of excessive fatigue, drowsiness, irritability, or euphoria is indications to immediately return to the shelter. Pain, numbness, or tingling in the extremities are indications to return immediately to the shelter. When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation, or the worker should change into dry clothing. Never return to work in wet clothing.

10. STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

10.1 SITE RULES/PROHIBITIONS

Using common sense, operating under the "buddy system" (or two-person rule), and following safe practices can reduce hazards due to normal project activities. In addition to the general site safety procedures contained in the WESTON Corporate EHS Program field operating procedures guide (which will be on-site), the following procedures will be used:

- No running or horseplay will be allowed.
- Hot work will be restricted in the work zone without the proper hot-work permit. Equipment will be bonded, grounded, and explosion-resistant, as appropriate.
- UXO technicians will make every effort to identify a suspect UXO item. UXO will be visually examined for markings and other external features such as shape, size, and external fittings. If an unknown UXO item is encountered, the on-site USACE representative will be notified immediately. Under no circumstances will any fuzed UXO be moved in an attempt to make a definitive identification.
- As a general rule, all fuzed UXO will be detonated in the original position found (BIP). This is the safest method to effect final disposition of munitions. Any item to be BIP will be sandbagged to mitigate blast effects and fragmentation projection.
- Only UXO technicians will handle UXO, and only during daylight hours. Personnel who will be handling UXO will not wear outer or inner garments having static-electricity-generating characteristics such as nylon.
- WESTON and subcontractor personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards associated with UXO. All field personnel will be under the supervision of a UXO Technician III or higher.
- General UXO safety guidelines are included below:
  - Projectiles containing base-detonating fuses are to be considered armed if the round is fired.

- Arming wires and pop-out pins on unarmed fuses should be secured prior to moving UXO.
- Do not depress plungers, turn vanes, or rotate spindles, levers, setting rings, or other external fittings on UXO.
- Do not attempt to remove or dismantle any components of UXO.
- UXO personnel are not authorized to render inert any UXO found on-site.
- UXO will not be taken from the site.
- Consider UXO, which may have been exposed to fire and detonation, as extremely hazardous.
- Do not rely on the color-coding of munitions for definitive identification.
- Assume that a practice munitions contains a live charge until investigation proves otherwise.
- Do not approach smoking munitions.

10.1.1 Buddy System

Work at the site will be performed using the buddy system. Team members will keep in visual contact with each other at all times. Team members will be made aware of any slip, trip, and lifting hazards along with any potential exposure to chemical substances, heat or cold stress, and general hazards within their work area.

10.1.2 Designated Eating/Break Areas

Eating/break areas will be located away from the active work area. No food or beverages will be allowed in any toxic work environments.

10.1.3 Designated Smoking Areas

Regulations governing approved areas for smoking and spark generation will be strictly followed. Smoking is prohibited except in designated smoking areas. The UXOSO will identify designated smoking areas. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines.

10.2 WORK PERMITS

No work requiring permits (e.g., radioactive, confined space, hot work) are associated with this project.

10.3 MATERIAL HANDLING PROCEDURES

Employees will not be handling contaminated soils, liquids, or radioactive materials as part of the scope of this project. Work areas and means of access will be maintained safe and orderly. Tools, materials, extension cords, hoses or debris will not cause tripping or other hazards. Storage and construction sites will be kept free from the accumulation of combustible materials. There are no radioactive materials present on-site. Drum, container, and/or tank handling is not anticipated during this project. Spill contingencies are listed in Section 15.

10.4 SPILLS

The following procedures comprise the spill containment program in place for activities at the site. Spill procedures will be reviewed by the UXOSO with team members.

10.5 SPILL CONTROL AND PREVENTION

WESTON anticipates that unleaded gasoline, diesel fuel No. 2, and motor oil will be the only substances with hazardous constituents that may be stored on-site and in quantities less than 5 gallons. To decrease the amount of pollutants to be stored on-site, WESTON plans, to the greatest extent possible, to conduct all fueling and repair of vehicles off-site.

Hazardous liquids that are necessary to conduct the Performance Work Statement will be stored in the smallest quantities possible. Should the storage of hazardous waste, or materials with hazardous constituents be necessary, a storage tank constructed primarily of non-earthen materials, or a stationary device designed to contain an accumulation of hazardous waste would be placed within an approved secondary containment of adequate size to contain a spill (110% of storage tank size). The tank would be managed in accordance with the APP, Clark County PWD Prevention, Control, and Countermeasures (SPCC) Plan, and 40 CFR Subpart I.

10.6 SPILL RESPONSE

Because of the nature of the operations, the potential for a spill of pollutants during operations is low. The highest probability for a spill will occur during re-fueling operations of equipment (e.g., filling a chainsaw's gas and oil tanks). In the event of a spill, WESTON will notify appropriate emergency responders and Greg Johnson, Clark County Munitions Safety Advisor Clark County Public Works Department. Clark County would complete any required notifications to the Washington State Department of Ecology. Additionally, WESTON will be equipped with spill kits on-site for immediate cleanup if a petroleum product is inadvertently spilled. Any spills originating from small containers (e.g., gasoline cans) would be contained using absorbent materials. If fuel or oil is spilled, the following measures will be taken:

- The spill area will be isolated and contained.
- Greg Johnson, Clark County Munitions Safety Advisor and Clark County Public Works Department will be notified during a spill response.
- The liquid and affected soil will be shoveled into a plastic bag and subsequently placed into a U.S. Department of Transportation-approved shipping container.
- Each container will be labeled to identify its contents.
- The container(s) will be shipped off-site and disposed of at a permitted facility in accordance with the CFR 260 – 270.
- Fire-extinguishing equipment meeting 29 CFR Part 1926, Subpart F, shall be on hand and ready for use to control fires.

10.7 NOTIFICATION

In the event of a spill or release, WESTON personnel will immediately dial 911, and will then notify the UXOSO or his designee. The UXOSO or designee will respond in accordance with the seriousness of the injury. The WESTON Project Manager and Corporate EHS will be informed of any injuries, minor or serious. The WESTON UXOSO will file an incident report within 24 hours of the accident.

10.8 DRUM/CONTAINER TANK HANDLING

Drums used for scrap metal containment will be UN approved open-top 55-gallon reconditioned drums. The drums will not be filled beyond the 800 pound weight capacity specific to the drum (1A2/X425/S/02). Personnel will use proper tools, lifting techniques, and mechanical equipment (i.e., drum dolly) while using/moving drums to containerize debris.

10.9 MEC OPERATIONS

The requirements of the approved Explosives Safety Submission and Work Plan will be followed.

10.10 DRUG AWARENESS AND DRUG-FREE WORKPLACE

WESTON fully supports all aspects of the Drug-Free Workplace Act of 1988. As such, WESTON has implemented Operating Practice 05-01-010, Drug-Free Workplace. This practice is in accordance with Federal Acquisition Regulations Subpart 23.500. Strict disciplinary actions are enforced for any violation of WESTON's Drug-Free Workplace policy. All WESTON employees, as a condition of employment, have documented understanding and receipt of this policy.

While on duty, employees will not use or be under the influence of alcohol, narcotics, intoxicants, or similar mind-altering substances. Employees found to be under the influence of or consuming such substances will be immediately removed from the job site. Subcontractors will enforce WESTON's drug-free workplace requirements.

Any employee under a physician's treatment and taking prescribed narcotics or any medication, including over the counter, that may prevent a person from being ready, willing, and able to safely perform his/her duties will provide a medical clearance statement to their supervisor from the attending physician.

WESTON's Operating Practice emphasizes supervisor training, a provision for self-referral to treatment, and maximum respect for individual confidentiality as well as a provision for identifying and dealing with illegal drug users, including testing. WESTON's practice also

provides for education, counseling, rehabilitation, and coordination with available community resources.

10.11 EMPLOYEE DUTY SCHEDULE/BASIC FATIGUE MANAGEMENT PLAN

Personnel will follow WESTON's Employee Schedule. If extended periods of working long hours are required, the UXOSO and/or SUXOS will monitor employees for outward signs of fatigue. Employee rotations may need to be adjusted to allow for individual differences in how fatigue-related stress is handled and for employee-specific role on the project.

While working extended hours, employee travel time to and from work will be minimized to allow for sufficient rest and should be taken into account in determining hours per day and per week limits. Group transportation to and from the work location and lodging will be used to address this situation. Consideration should be given to "awake" time and not just the hours logged on a time sheet.

10.11.1 Fatigue Symptoms

Intrinsic Symptoms

Physical—Frequent, unexplainable headaches, muscle aches and pains, breathing difficulties, blurred/double vision, burning urination.

Mental—Difficulty focusing attention or distracted easily, depression, impaired judgment, and/or poor visual perception.

Extrinsic Symptoms

Physical—Degraded motor skills, tenseness and tremors, intolerant/irritable, increased reaction time, social withdrawal.

Mental—Absentmindedness, poor short-term memory, lack of interest and drive, confusion and fearfulness, slow startle response, worry, and anxiety.

10.12 TRAFFIC

Care must be taken to avoid motor vehicle accidents at all times. Whether on CBMR or off-post, posted speed limits will be obeyed at all times, and seat belts will be worn when driving. Daily review of traffic hazards and work patterns will be discussed. All drivers will be licensed.

10.13 UTILITY VEHICLE USE

UTVs may be utilized at this site to aid in transporting personnel and work materials to physical locations from the trailer area. A copy of the operator's manual will be kept with the vehicle at all times and protected from the elements. UTV operators and passengers will wear seat belts. Operators and passengers shall wear goggles at all times when a utility vehicle, not equipped with a windshield, is in motion. Occupancy in the UTV is limited to manufacturer-designated seating that has built-in seatbelts. Passengers may not ride in the vehicle's back cargo area unless it is manufacturer-equipped with built-in seatbelts. In accordance with EM385-1-1, Section 18.J.14, personnel will also be required to wear gloves and a helmet that conforms to U.S. Department of Transportation-218 standards; such gloves and helmets shall be worn at all times while operating UTVs unequipped with a roll-over protective device.

10.14 HUNTING AWARENESS

Site personnel should be aware of established seasons and authorized hunting areas but realize that hunters could stray outside that area.

10.15 SECURITY PLAN

10.15.1 Site Access

Because of the widespread work zones and site access, UXO personnel will monitor the work areas where UXO operations are in progress to ensure that no unauthorized personnel access the work locations.

Site control procedures will be established to ensure site access to unauthorized personnel is limited. This will prevent persons who may be unaware of site conditions from being exposed to inherent hazards. Munitions debris will be containerized and secured in a central storage area to

prevent unauthorized tampering. Any field equipment that may cause potential injury when left unattended will be removed from the site or otherwise rendered non-dangerous. Field team leaders will be responsible to ensure that the specific work areas are secure during nonworking hours.

10.15.2 Site Control

The work area is located within a fenced reservation which is secured by locked gates during non-working hours. Currently two Clark County employees (Jerry Barnett and Warren Fjeldos) reside on site. In addition there is a strong law enforcement presense from the Clark County Sherriff's Office and the Federal Bureau of Investigation with weekly use of the FBI firing range.

10.15.3 Theft

Although the probability of on-site equipment theft is low, extraordinary efforts will be made to secure equipment. Steel Conex containers with reinforced locks will be used for equipment storage. If it is necessary that equipment remain inside a vehicle, it will be kept out of obvious sight, and the vehicle will be secured with doors locked and all windows closed. Personnel will secure vehicles, even if parking for only brief periods, and will carry vehicle keys with them at all times while off-site.

In the event a theft does occur, local authorities will be promptly notified and appropriate WESTON personnel will be notified. NOITrack information will be completed within 24 hours.

10.15.4 Personal Confrontation

Personnel will be observant of their surroundings. They should ensure their own safety, the safety of their co-workers, and the safety of the public by not confronting or challenging aggressive perpetrators. Authorities should be contacted if they observe any unusual circumstances.

10.16 MOTOR VEHICLE SAFETY

Safety is of utmost importance at WESTON. Employees must act responsibly every day to ensure the safety of themselves and others. This safety commitment also applies when driving vehicles. All employee drivers are required to operate vehicles safely, obeying federal, state, and local laws, and company policies. Driving is a privilege, not a right.

10.16.1 Employee Requirements/Responsibilities

Drivers of WESTON vehicles must possess a current, valid driver's license of the appropriate class required for their driving needs, e.g., class C, or Commercial Driver's License with HAZMAT endorsement. Driving duties and functions are to be performed in a safe, legal, and professional manner. WESTON personnel are to attend periodic defensive driving training and other driver safety meetings as scheduled through their local Health and Safety Officers. Driver orientation program and/or driving evaluation tests may be required of drivers to assess overall driving skills.

Driving requires a high level of skill and alertness. When fatigue, illness, or medication impact alertness, reflexes, and decision-making capabilities, an employee driver should cease driving until the situation improves or is corrected and contact his/her manager to discuss the situation.

Compliance with all federal, state, and local laws is expected. Unsafe vehicles and related equipment will be reported and repaired. Unsafe vehicles are not to be driven on WESTON business.

NOITrack will be used to report any vehicle accident while on the job, or any accident occurring at any time if involving a company-owned or insured "allowance" vehicle.

10.16.2 Compliance Issues/Driving Practices

Speed Limits

Drivers are required to obey posted speed limits and other traffic laws. Fines for any traffic violations are the employee's responsibility.

Seat Belts

WESTON drivers and their passengers are required to wear seat belts at all times while the vehicle is in operation.

Distracted Driving

It is recognized that distracted driving can contribute to accidents. Accordingly, WESTON employees are to exercise caution and good judgment when driving. Reading maps, eating, placing or receiving a call on a cell phone, and other activities may contribute to an accident. Cell phone use while driving, including the use of hands-free devices, creates a distraction and driver inattention. The following basic guidelines should always be observed:

- Make outgoing calls after you have pulled over to a safe area.
- Let incoming calls go to voice mail, or if answering the phone is necessary, make sure the caller knows you are driving and keep the call short.
- At all times, drivers are to operate vehicles in a safe, legal, and professional manner.

Transporting Weapons

Transporting weapons (such as firearms, large knives) or dangerous property (significant or placardable quantities of regulated hazardous materials or substances) is prohibited, unless specifically authorized.

10.17 SANITATION

Employers shall establish and maintain hygienic sanitation provisions for all employees in all places of employment. General housekeeping activities will occur daily.

10.17.1 Drinking Water

An adequate supply of potable water shall be provided in all places of employment, for both drinking and personal cleansing. Non-potable water shall be identified with markings and be kept separate from potable water.

Cool drinking water shall be provided during hot weather. Only approved potable water systems may be used for the distribution of drinking water. Construction trailers and other temporary or semi-permanent facilities shall be properly connected to the local municipal water supply unless the remoteness of the location makes this prohibitive. When unable to connect into the municipal supply, temporary potable water systems shall be utilized, with the services provided by a licensed potable water contractor. “Reclaimed water” (treated wastewater) use in potable systems is strictly prohibited.

10.17.2 Toilets

Toilets are required to be present in all places of employment. The job site shall be provided with chemical toilets. Hand soap or similar cleansing agents shall be provided. The requirements do not apply to mobile crews or to normally unattended work locations if employees working at these locations have transportation readily available to nearby toilet and/or washing facilities. Toilets (port-a-potties) and washing facilities will be located adjacent to the project field office.

10.17.3 Procedures for Vermin Control

The site will be kept clean and organized. Organics such as foods will be wrapped and then discarded to avoid attracting pests.

10.17.4 Waste Disposal

All sweepings, solid or liquid wastes, refuse, and garbage will be removed in a manner that avoids creating a menace to health and should be discarded as often as necessary or appropriate to maintain sanitary conditions in the place of employment. All waste will be disposed in the dumpster on-site

11. SITE CONTROL

The UXOSO coordinates access control and security on-site. Because of the hazardous nature of UXO, the UXOSO will establish an exclusion zone (EZ) during work activities in accordance with the approved Explosive Safety Submission Amendment and procedures detailed in the Work Plan. The EZ is the work site and will encompass an area large enough to prevent personnel injuries from fragmentation resulting from unintentional or intentional detonations. Only essential personnel are allowed in the EZ during UXO operations. Authorized personnel are those who have completed the required training and meet medical requirements.

During on-site operations, the SUXOS will order operations to cease if nonessential personnel are observed within the EZ. To ensure safety, site controls include the following:

- Eating, drinking, and smoking are prohibited except in designated areas.
- UXO operations cease if nonessential personnel are present.
- The SUXOS, UXOSO, or their designee, will escort authorized site visitors.
- All personnel entering the site, including visitors, shall wear the proper PPE and sign in and out on the site visitors' log.
- The UXOSO maintains the Site Control Log to ensure accurate accountability of personnel on-site.
- The UXOSO provides a safety briefing to all personnel entering the site to inform them of potential site hazards. All personnel must acknowledge this briefing by signing the safety log.
- In case of an emergency, personnel will exit the site and move to a designated safe area. The UXOSO will determine the designated safe area that is located upwind of the site outside of the fragmentation area. The SUXOS will notify the Clark County Munitions Safety Advisor and Project Manager if an emergency warrants site evacuation.

The support zone will be established as the area outside the exclusion zone, and is the location of the administrative and other support functions such as material and equipment staging. The support zone includes facilities such as the change area, office spaces, and supply storage areas.

Specific areas within the support zone will be designated for smoking, chewing, eating, and drinking. The potential of cross contamination is not applicable to this project based on the project characterization; therefore, a contamination reduction zone will not be required.

12. PERSONAL HYGIENE AND DECONTAMINATION

12.1 PERSONAL HYGIENE

Appropriate hand-washing facilities with soap will be available at the field office. In addition, hand sanitizer will be available inside the field office. Personnel will practice sound hygiene practices, washing hands, face, and arms at the hygiene station after operations have concluded.

Following Centers for Disease Control guidelines, personnel should wet their hands with clean running water and apply soap. A hygiene station will be located adjacent to the field office. Use warm water if it is available. Rub hands together to form lather and scrub all surfaces. Continue rubbing hands for 20 seconds. Rinse hands well under running water. Dry your hands using a paper towel. If possible, use that same paper towel to turn off the faucet.

13. EQUIPMENT DECONTAMINATION

Instruments and tools will be routinely wiped down with a clean, damp rag or towel to prevent mud and/or debris accumulation. Such accumulations can adversely affect equipment operation.

14. EMERGENCY EQUIPMENT AND FIRST AID

14.1 FIRST AID

Two appropriately trained WESTON or subcontractor personnel will provide on-site first aid/CPR support. In the event specialized/elevated care is necessary, either WESTON or the on-call emergency medical technician/ambulance service will transport the injured person to the appropriate medical facility.

14.1.1 Medical Supplies

Medical supplies required to be on-site are listed in Table 10. The minimum requirements of ANSI Z308.1-1998 and EM 385-1-1, November 2008, Section 03.B, (Table 10), will be met.

14.2 EMERGENCY EQUIPMENT

The emergency equipment listed in Table 9 will be maintained in proper working order and frequently inspected for completeness during site operations. Table 9 lists the minimum equipment necessary.

The size and number of first-aid kits will be sufficient to accommodate the maximum number of people (including visitors) on-site at any given time. The kits will be located at each work site, and all personnel will be informed of their locations. All kit locations will be equipped with adequate water and other supplies necessary to cleanse and decontaminate burns and other wounds. The contents of First Responder kits (6626) are provided in Table 10.

14.3 FIRE EXTINGUISHERS

The field office and each work site will be equipped with a dry-chemical type 4A:20B:C fire extinguisher. Dry-chemical fire extinguishers will be provided at any other site location where flammable materials may present a fire risk. In addition, a fire extinguisher rated at least 2A:10B:C will be located in each vehicle and piece of heavy equipment on-site. The SUXOS, UXOSO, Project Manager, and Division Health and Safety Officer will be notified immediately after any fire incident occurring during site activities. Regulations governing approved areas for smoking and spark generation will be strictly followed.

15. EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

Site topography and prevailing weather conditions are addressed in Section 2 of the SSHP. Emergency response procedures will be rehearsed to permit evaluating the effectiveness of the planned response capabilities. The UXOSO will respond to all emergencies. In the event that the UXOSO is involved in the emergency, a designee will assume responsibility. Specific reporting responsibilities are as follows:

- Notify appropriate individuals, authorities, and/or health-care facilities of the activities and hazards of the emergency.
- To prepare for an emergency and to minimize the impacts, the UXOSO will:
  - Review emergency procedures with affected employees.
  - Conduct a test of the emergency plan in the form of a drill to ensure effectiveness.
  - Ensure the roster of all employees and subcontractors is updated daily.
  - Ensure that an eyewash station, first-aid supplies, and fire extinguishers are available at the site.
  - Have working knowledge of all safety equipment available at the site.
  - Ensure that a map detailing the most direct route to the hospital is prominently posted in the site trailer and a copy in site vehicles, complete with all necessary telephone numbers.

15.1 PRE-EMERGENCY PLANNING

The medical center identified for this project is the PeaceHealth Southwest Medical Center located at 8716 East Mill Plain Boulevard in Vancouver, Washington. The facility is approximately 10 miles southeast of the Site. Travel time is approximately 25 minutes. Maps showing the route to the hospital will be posted near the site telephone and in a Weston vehicle on-site and included as Figure 4 of the APP. The hospital route will be verified prior to work initiation.

An emergency evacuation drill will be performed prior to starting field operations. WESTON has evaluated the emergency medical services. WESTON's form for evaluation and confirmation of these services are provided in Attachment 8 of the APP.

The UXOSO will have a roster of individuals on-site so that they can be accounted for in the event of an emergency.

15.2 PERSONNEL AND LINES OF AUTHORITY FOR EMERGENCY SITUATIONS

This project is located on Clark County land, where local authorities of Clark County have jurisdiction. The UXOSO will be appointed as an Emergency Coordinator (EC) and a system would be implemented to provide a common framework within which people can work together effectively.

15.3 CRITERIA AND PROCEDURES FOR EMERGENCY RECOGNITION AND SITE EVACUATION

15.3.1 Medical Emergency and Personal Injury

The first worker who notices that a medical emergency or personal injury has occurred shall immediately make a subjective decision whether the emergency is life-threatening and/or otherwise serious and will then proceed as described in the following subsections. Because no contaminants of concern exist on-site, emergency decontamination of personnel will not be required.

Life-Threatening and/or Otherwise Serious Incident

If a life-threatening incident occurs, emergency medical assistance will be immediately requested. If an apparent life-threatening and/or otherwise serious incident has occurred, the first person who identifies the situation will summon the UXOSO or SUXOS. The UXOSO or SUXOS, whoever arrives first, will assume the role of EC. The EC shall be apprised of the situation and told where the injured person(s) is/are located. As the EC proceeds to the accident scene, communications channels shall be opened and kept on standby until the EC has surveyed the scene and performed a primary survey of the injured person.

The EC shall then determine whether emergency assistance should be summoned and the information that must be relayed, and shall provide emergency action principles that are consistent with the injury. The EC shall appoint a staff person or persons who will meet the

emergency responders and take them quickly to the injured person. If necessary, decontamination of the individual shall be performed at the direction of the EC.

Non-Life-Threatening Incident

If it is determined that no threat to life is present, the worker shall assist the injured person to a safe location and contact the UXOSO. The injured person will then be treated and monitored in accordance with standard first-aid procedures and the SSHP.

15.3.2 First-Aid Procedures

A first-aid kit will be provided on-site complying with the criteria contained in ANSI Z308.1-2006. A list of items contained in the kit is presented in Table 10.

Trained personnel will use approved measures for treatment. For minor injuries, routine first-aid procedures will be used. For major injuries, an ambulance will be called immediately and the appropriate first aid administered while awaiting the arrival of the ambulance.

15.3.3 Worker Injury or Illness

The UXOSO will be responsible for monitoring the general health of site workers. Site illnesses, conditions, or injuries that can be expected given the working conditions include hypothermia, frostbite, exposure to chemicals found at the site, construction-related injuries, insect bites, and injuries caused by slips, trips, and falls.

These conditions will be prevented by properly training site workers in the appropriate use of health and safety equipment, dressing appropriately, monitoring the breathing zone atmosphere, and maintaining good housekeeping procedures. These activities are discussed in more detail throughout this SSHP.

The specific response to an injury or illness will depend on its type and severity, but in general, first aid will be administered in the field by the UXOSO, who will be trained in first aid and CPR. The worker may then be transported to the hospital designated in this SSHP. General guidelines for first aid are as follows:

- For minor injuries, routine first-aid procedures will be used.

- For major injuries, an ambulance will be called immediately and the appropriate first- aid administered while awaiting arrival of the ambulance.
- Trained personnel will use approved measures to administer treatment.

15.3.4 Emergency Response

During an emergency, the following actions will be taken, with some actions conducted concurrently. No one will attempt emergency response/rescue until the situation has been assessed and the appropriate response outlined. Field activities will cease, personnel will be warned, and the area isolated. The following procedures are for any emergency response:

- Fire or explosion and prevention
- Spills and spill prevention
- Inclement weather
- Evacuation planning

The minimum actions taken will be as follows:

- All work will cease
- All affected employees and subcontractors will be warned/ notified of the emergency
- The area will be isolated
- Appropriate notifications will be made

Rescue/response may include the following:

Assessment: Assess existing and potential hazards to site personnel and the off-site population.

Determine:

- Whether and how to respond
- The need for evacuation of site personnel and off-site population
- The resources needed for evacuation and response

Survey Casualties:

- Locate all injured persons and assess their condition
- Determine resources needed for stabilization and transport

Request Aid—Contact the required off-site/on-site personnel or facilities, such as the ambulance, fire department, and/or police.

Allocate Resources—Allocate on-site personnel and equipment to rescue and initiate incident response operations.

Extricate—Remove or assist injured persons from the area, using appropriate PPE equipment and procedures.

Control—As trained, and as determined safe, assist in bringing the hazardous situation under complete or temporary control and use measures to prevent the spread of the emergency.

Decontaminate—Not necessary.

Stabilize—Administer any medical procedures that are necessary before the injured person(s) can be moved. Stabilize or permanently fix the hazardous condition. Attend to what caused the emergency and anything damaged or endangered by the emergency.

Transport—No one will be transported without being decontaminated or protected from contaminating others. Take measures to minimize chemical contamination of the transport vehicle, ambulance, and hospital personnel.

Casualty Logging—Record who, time, destination, and condition upon transport.

Evacuate:

- Move site personnel to a safe distance upwind of the incident.
- Monitor the incident for significant changes. The hazards may diminish, permitting personnel to reenter the site, or hazards may increase and require public evacuation.

Casualty Tracking—Record disposition, condition, and location.

Notification—Notify appropriate individuals/entities.

Evacuation Routes and Procedures

Personnel shall exit the site by the nearest means of egress during accidents requiring evacuation. Once off-site, personnel shall assemble at the location designated by the UXOSO and be accounted for. Any missing personnel shall be brought to the attention of the responders.

Emergency Alarm Systems

Portable telephones and/or two-way radios will be available for site and emergency communications (WESTON field office, Project Manager, SUXOS, UXOSO, and field staff). In addition, equipment spotters will be provided with emergency air horns to alert all personnel to stop work immediately. Emergency communications and signals are described in the tables below. All field personnel will be trained regarding site emergency signals.

Emergency service personnel (police/fire/ambulance) will be summoned by requesting support from the Department of Emergency Services personnel.

Hand and Emergency Signals Communications

It is essential that workers have a means of communicating rapidly and effectively during heavy equipment operations, construction, hazardous waste operations, and other types of activities. Communication while wearing PPE can be extremely difficult. This establishes guidance for uniform communication protocols to be used, as needed, in field operations.

General Hand Signals

Signal	Meaning
Point index finger toward self	I; me
Point index finger toward object	It; them
Point index finger toward person	You; them
Circle index finger at group	We; us; all of us
Pointed finger on extended arm	Look in that direction
Beckon with index finger	Come here
Point with thumb in a particular direction	Move this way; go this way

Signal	Meaning
Hold index finger up near head	Wait
Slowly ease palm face down	Relax; slow down
Put palm over brow	Scout it out; check it out
Move hand far away from body	Stay away
Hands on top of head	Need assistance
Grip partner's wrist or place both hands around partner's arm	Leave area immediately
Thumbs up	OK; I'm all right
Thumbs down	No; negative; bad; not OK
Hand gripping throat	Cannot breathe; out of air
Wave hands over head from side-to-side	Attention; stand-by for the next signal
Swing hand from direction of person receiving signal to directly overhead and through in circle	Come here
Clenched fist of extended arm	Stop motion/hold position
Draw index finger across front of throat	Shut off engine; cut off power; quit
Place palm face down and rotate from side to side	Unsure; can't decide
Form a circle with thumb and index finger	OK; I understand; agree
Military salute	I understand and will comply

Emergency Signals

Emergency signals are critical for alerting workers of danger and to maintain site control during an emergency. Bullhorns, radios, air horns, and similar devices will be used as described above for emergency communications. Emergency hand signals should be used as a secondary means of communication.

Signal	Meaning
One long sound/blast of the emergency alarm signal, air horn, siren, whistle	Emergency situation, face safety watch and watch or listen for directions
Pause; followed by a number of short	Evacuate to the pre-designated emergency meeting place indicated by the number of

Signal	Meaning
sounds, 1, 2, 3, or 4	sounds
Two long blasts of the emergency alarm signal, air horn, siren, whistle	All clear
Point one arm in direction of evacuation, make a large circling motion with the other arm in direction of evacuation	Evacuate the area
Hand clutching throat	Cannot breathe; out of air
Grip partner's wrist or place both hands around partner's arm	Leave area immediately

Radio Communications

When radio communication is used, personnel will be instructed in the use of the radio, which channel should be used, and in the following radio guidelines. Personnel will use the radio only for necessary work-related communication.

- Speak clearly.
- Call the name or call sign of the individual or unit you are trying to reach and identify yourself (e.g., "Unit One; this is Safety").
- Wait for acknowledgement (e.g., "Safety, this is Unit One") before you continue transmission.
- Proceed with your transmission. When finished, say "Over" when you expect a response. When transmission is complete and no response is expected, say "Out."
- When receiving a radio call, acknowledge the call immediately unless doing so would interfere with safety.
- If a transmission is incomplete or not understood, request clarification.
- Emergency calls should begin with the words "Emergency, Emergency, Emergency." Give absolute priority to emergency communication. Unless answering or aiding the emergency call, do not use the radio until certain it will not interfere with further emergency communication.

- Ensure that radios are charged and tested prior to each work shift and as necessary thereafter.
- Malfunctioning radios must not be used and must be replaced immediately.
- Do not transmit false information or unidentified communication.
- Profanity and indecent language are prohibited. Transmittal of sensitive information over the radio is prohibited.

15.4 DECONTAMINATION AND MEDICAL TREATMENT OF INJURED PERSONNEL

Because there is no known contamination on-site, decontamination of site personnel will not be required.

15.5 EMERGENCY MEDICAL FACILITIES AND PHONE NUMBERS FOR RESPONDERS

PeaceHealth Southwest Medical Center is the closest hospital to the site. It is located at 8716 East Mill Plain Boulevard, Vancouver, WA 98664, Phone Number: (360) 256-2000. Directions to the hospital are as follows:

1. Exit Camp Bonneville from south on NE 232nd Ave.
2. Turn right onto NE Fourth Plain Road (State Road 500).
3. Go west on State Road 500 approximately 3.5 miles and turn left (south) on US Route 205. Continue approximately two miles and turn right on East Mill Plain Boulevard.
4. Travel approximately one mile and PeaceHealth Southwest Medical Center will be on the right. The map on the following page illustrates the medical center's location.

The emergency telephone numbers listed in Table 11 shall be prominently posted in WESTON's field office and vehicles. The emergency telephone numbers, along with the APP, OSHA 300 Log, deficiency tracking system documents, safety and health promotional posters, date of last work day injury, and OSHA Safety and Health poster, will be kept unobstructed and readily available to the workers.

15.6 CRITERIA FOR ALERTING LOCAL COMMUNITY RESPONDERS

In the event of an emergency requiring outside emergency services, WESTON personnel will immediately dial 911 to contact the appropriate organization. Following the phone call, WESTON personnel will contact on-site personnel to inform them that emergency service personnel and equipment will be entering the work area. Subsequent to these notifications, appropriate WESTON personnel will be contacted and informed regarding the situation.

15.7 FIRE PREVENTION, PROTECTION, AND RESPONSE

Potential sources of fuel include diesel, gasoline, and combustible loads such as paper and leaves. Sources of ignition include combustion engines and electrical sources. Flammable liquids will be properly stored in safety cans and/or flammable cabinets. Housekeeping will be performed daily to limit fuel loads. Types of fire suppression systems include multipurpose ABC portable fire extinguishers. In case of fire, evacuate the building or area immediately. Activate fire alarms and/or dial 911 or the established Fire Emergency Number from a safe location. Indicate what is happening, the location of the fire, and whether there are injuries. Comply with requests from the 911 operator for information. Do not hang up until told to do so by the operator, or allow the operator to hang up first. Upon completion of the emergency phase, comply with incident notification procedures.

NOTE: No attempt will be made to fight a fire if UXO may be present. If this occurs, all personnel will evacuate and call the local fire department listed in **Table 11**.

If the fire is small and manageable with fire-extinguishing equipment at hand, and you are trained in the use of this equipment, you may make the decision to use this equipment while waiting for advanced assistance. Never place yourself in danger, always have a plan for escape, and never attempt to fight a fire if there are any doubts about the type of fire or your ability to successfully fight the fire. Never allow the fire to get between you and your escape route.

15.7.1 Wildfires

Prevention

Site personnel should practice smart fire safety habits and watch out for hazardous conditions. If conditions are dry, wildfires can pose a threat—not only because there is plenty of fuel to burn, but also because rural areas and remote locations often do not have easy access for firefighters. There also is a chance that embers from a fire a mile or more away may fall onto nearby vegetation and cause them to catch fire. The following preventive measure will be observed:

- Smoke only in designated areas.
- Avoid driving through high grass or areas where vehicle exhaust or hot engine surfaces could cause fires.
- Keep a fire extinguisher handy.
- Be extra cautious during the dry season and observe warnings and prohibitions established by Forestry Service or other agencies.
- Be aware of wild fires in neighboring areas.

Awareness and Response

Wildfires can spread quickly and without warning. A subtle shift in the wind could send the flames in your direction even though authorities may have deemed your area safe. Make sure you have a plan in place:

- Be aware of wildfires in neighboring areas.
- Do not attempt to fight forest fires. If a fire or smoke is observed, notify all site personnel, initiate evacuation, and report the fire to the designated emergency agencies.
- Designate a place to meet if there is a fire.
- Identify multiple places you could evacuate to, like a motel outside the danger zone.
- It is very easy to panic, but if you remain calm and prepare for emergency situations, you will increase your chances of making a safe evacuation. If you are driving:
- Roll up your windows and close your air vents.

- Drive slowly and turn on your headlights.
- Don't drive through heavy smoke.

15.7.2 Fire Extinguishing Equipment

Fire extinguishing equipment meeting 29 CFR Part 1926, Subpart F, shall be on hand and ready for use to control fires.

- Flammable and Combustible Materials (liquids, gases)
  - Flammable materials must be properly labeled, stored, handled, and used.
  - No smoking or use of open flame-producing devices within 50 feet of flammable and combustible materials.
  - Obtain MSDS for all flammable materials in use and ensure all personnel are aware of hazards.
  - All containers are to be properly labeled with contents, the word “Flammable”, and in accordance with hazard communication requirements.
  - Store materials in well-ventilated areas that are free of ignition sources and flame or sparks.
  - Ensure that incompatible materials are stored in remote locations from each other (e.g., keep flammables from oxidizers).
  - Limit quantities to minimum required.
  - Store cylinders in upright and secure positions.
  - Bond and ground containers as (and where) necessary.
  - Use proper storage cabinets for flammable and combustible materials. Contact EHS Staff for assistance.
  - Use only approved containers.
  - Use and dispense only in well-ventilated areas.
- Combustible Materials (solids)
  - Solid combustible materials include; wood, paper, and cloth. Proper housekeeping reduces concerns for combustion of these materials. Use proper receptacles for disposal and dispose of routinely.
- Oxidizers
  - An oxidizer is a substance that increases the flammability of materials, allowing them to burn easier. Examples include; pure oxygen, chlorine, ammonium nitrate. Store oxidizers in a remote location from flammable and combustible materials.
- Electric Appliances

- Do not use electric appliances near flammable or combustible materials. Never place an appliance on an unstable surface. Use only UL- or FM-approved appliances. Follow the manufacturer's recommendations or requirements for use and maintenance. Obtain approval from EHS staff prior to purchase and use of portable heater units in office settings. Do not leave portable heaters on and unattended.

- Smoking
  - Smoking is prohibited indoors. Smoking is allowed only in outdoor, designated areas. Smokers are to maintain smoking areas in a clean and safe condition. Ensure that receptacles for disposal of cigarettes and other smoking materials are appropriately constructed, free of combustible debris and when necessary, are cool before emptying into waste receptacles.
- Housekeeping
  - Personnel are responsible for keeping work areas free of combustible materials and debris.
  - Weeds and grass must be properly maintained to limit potential fire hazard

16. LOGS, REPORTS, AUDITS, INSPECTIONS, AND RECORDKEEPING

16.1 SAFETY LOG

The UXOSO will maintain a safety log of all safety-related activities. The UXOSO is responsible for ensuring that health and safety activities for the day, as well as safety meeting minutes, are documented in the safety log or filed appropriately. In addition, the UXOSO will maintain a site OSHA 300 log.

16.2 TRAINING LOG

The UXOSO is responsible for ensuring that all training conducted relative to job site activities is documented appropriately.

16.3 SITE CONTROL LOG

A log of all personnel visiting, entering, or working on the site will be maintained. The log will include the following: date, name, agency or company, and the time entering and exiting the site. This information, including dates, will be recorded in the site control log.

16.4 INSPECTION FORMS

Daily safety and health inspections will be conducted by the UXOSO with the results recorded in the safety log. The UXOSO will conduct periodic safety and health audits to ensure site personnel are performing the tasks in accordance with the Work Plan and this SSHP.

TABLES

Table 1
Roles and Responsibilities for Key Safety and Project Personnel

Position	Description of Key Responsibilities
Project Manager George Overby, CHMM	▪ Overall responsibility for the management and completion of the project. ▪ Responsible and accountable for project safety. ▪ Overall responsibility for ensuring that project personnel (including subcontractor personnel) comply with EHS regulations, program requirements, and procedures. ▪ Ensure development and implementation of project SSHPs and indicate concurrence with final plans after required EHS reviews. ▪ Ensure project personnel meet applicable safety certification requirements. ▪ Ensure project support is acquired from appropriately qualified safety personnel such as the Corporate EHS Manager, Division H&S Officer and SSHO/UXOSO. ▪ Ensure project personnel comply with applicable EHS requirements and corporate or client procedures. ▪ Halt any project work activities that represent an imminent hazard. ▪ Ensure appropriate safety equipment and materials are provided to the project. ▪ Ensure timely and accurate reporting and investigation of incidents, accident, or injuries involving project personnel, with support from the risk management department. Ensure corrective actions are implemented completely. ▪ Ensure proper response and internal notification regarding inspections by regulatory agencies. ▪ Ensure all project personnel have met the site-specific experience and training requirements.
Corporate EHS Manager George Crawford, CIH	▪ Approve and ensure the implementation of the WESTON Corporate EHS Program, the APP, SSHP and any amendments. ▪ Conduct field audits to assess the effectiveness and implementation of the APP and SSHP. ▪ Evaluate and authorize changes to the APP and SSHP based on field and occupational exposure, as necessary. ▪ Function as a quality control (QC) staff member.
Project Health and Safety Manager Michael Stuart	▪ Oversee and maintain the WESTON Corporate EHS Program, the APP and SSHP. ▪ Conduct site visits, as necessary, to audit the effectiveness of the APP and SSHP. ▪ Serve as a technical safety advisor and provides technical assistance and support. ▪ Develop the APP and SSHP. ▪ Develop modifications to the APP and SSHP as necessary.
UXOSO Randy Schneider	▪ Responsible for implementing the APP and SSHP by ensuring that all project personnel follow the requirements of the APP and SSHP. ▪ Be present during UXO operations and ensure the implementation of the Explosives Safety Submission (ESS) Amendment. ▪ Directly communicates with the SUXOS/site manager, PM and EHS Manager. ▪ Conduct daily safety meetings for site personnel to discuss the day's activities, associated hazards, and UXO safety. ▪ Review site personnel training and experience documentation to ensure compliance with the APP and SSHP. ▪ Coordinate changes/modifications to the APP with the appropriate site personnel. Conduct or coordinate project-specific training. ▪ Report any incidents that occur on-site to the SUXOS/Site Manager, PM and Division H&S Officer. ▪ Implement safety corrective actions through training and reinforced awareness. ▪ Maintain exposure data. ▪ Has stop-work authority for all safety issues.

Table 2
Roles and Responsibilities of Key Site-Specific Personnel

Position	Description of Key Responsibilities
UXOSO, Randy Schneider	▪ Responsible for implementing the APP and SSHP by ensuring that all project personnel follow the requirements of the APP and SSHP. ▪ Competent person as stated in OSHA 29 CFR 1926.32. ▪ Be present during UXO operations and ensure the implementation of the Explosives Safety Submission (ESS). ▪ Directly communicates with the SUXOS/Site Manager, PM and EHS Manager. ▪ Conduct daily safety meetings for site personnel to discuss the day's activities, associated hazards, and UXO safety. ▪ Review site personnel training and experience documentation to ensure compliance with the APP and SSHP. ▪ Coordinate changes/modifications to the APP with the appropriate site personnel. Conduct or coordinate project-specific training. ▪ Report any incidents that occur on-site to the SUXOS/Site Manager, PM and Division H&S Officer. ▪ Implement safety corrective actions through training and reinforced awareness. ▪ Maintain exposure data. ▪ Has stop-work authority for all safety issues.
MEC Response and Removal Task Manager, Tony Clark.	▪ Plan, coordinate, and supervise field activities in coordination with SUXOS. ▪ Supervise multiple field sampling teams. ▪ Maintain project documentation and report any incidents that occur on-site to the PM.
SUXOS, Bruce Moe	▪ Plan, coordinate, and supervise field activities in coordination with Field Operations Manager and manage all UXO operations. ▪ Supervise multiple teams. ▪ Maintain project documentation, and prepare the Daily SUXOS Site Report. ▪ Report any incidents that occur on-site to the PM. ▪ Fully perform all of the UXO Technician III, II and I functions.
UXO Quality Control Specialist (UXOQCS), Mike Everman	▪ Monitoring all activities during removal activities. ▪ Ensuring that procedures are being carried out in accordance with established requirements and protocols. ▪ Understanding the project's quality-related requirements and the plans and procedures for implementing them. ▪ Performing a QC check of all grids completed by the UXO Teams. ▪ Preparing the Daily Quality Control Report (DQCR). ▪ Directly communicates with the Corporate MEC Operations Manager on UXO operations and QC issues.
UXO Technician III	▪ Supervises the team to which he/she is assigned. ▪ Ensures the team's actions are accomplished safely and efficiently. ▪ Maintains field records related to the team's operations. ▪ Implements the work, safety, and quality plans for this project. ▪ Supervises the conduct of on-site evaluations related to UXO operations. ▪ Is familiar with the duties of all assigned personnel and is able to perform the functions enumerated for UXO Technicians I and II. ▪ Provides subject matter expertise and leadership to ensure the team's safety and the project's quality. ▪ If assigned as Demolition Supervisor, additional responsibilities include: ▪ Trains personnel regarding the nature of the materials, hazards, and precautions. ▪ Coordinates with the /Site Manager and UXOSO to ensure required notifications are completed prior to demolition. ▪ Is present and in direct control during on-site disposal operations.

Table 2
Roles and Responsibilities of Key Site-Specific Personnel

Position	Description of Key Responsibilities
UXO Technicians II and I	▪ Primary and secondary workers on-site and report directly to the UXO Technician III. ▪ Perform MEC operations, mag and dig, reacquisition, removal, and disposal operations. ▪ Will meet the qualifications of a UXO Technician I at a minimum and be under the direct supervision of a UXO Technician III.
Clark County Munitions Specialist Greg Johnson	▪ •Reviews and approves the APP and SSHP. ▪ •Recommends modifications to the APP and SSHP as necessary based on changing site conditions. ▪ •Conducts site visits, as necessary, to audit the effectiveness of the APP and SSHP and ensure compliance with WP. ▪ •Serves as a technical safety advisor and provides technical assistance and support to the project team.

Table 3
Competent Person Requirements

Competent Person Requirement	Regulatory Reference	Person Designated
UXOSO	EM 385-1-1 Sec. 01.A.17; Department of Defense Explosives Safety Board Technical Paper-18	Randy Schneider
Hazardous Waste Operations and Emergency Response	EM 385-1-1.28 29 CFR 1926.65	Randy Schneider
General Inspections of Construction Sites	EM 385-1-1.01.A.12 29 CFR 1926.20	Randy Schneider
Unsanitary Conditions	EM 385-1-1.02 29 CFR 1926.27	Randy Schneider
Hearing Protection	EM 385-1-1.05.C 29 CFR 1926.101	Randy Schneider

Table 4
Qualified Person Requirement

Qualified Person Requirement	Designated Person(s)
Brief Visitors on Site Hazards and PPE	Randy Schneider
Licensed Blaster(s) for the State of WA	Michael Everman

Table 5
Percent Sunshine Factors Heat Stress Prevention and Monitoring

Percent Sunshine (%)	Cloud Cover	Sunshine fraction
100	No cloud cover	1.0
50	50% cloud cover	0.5
0	Full cloud cover	0.0

Table 6
Physiological Monitoring Schedule Heat Stress Prevention and Monitoring

Adjusted Temperature	Level D (Permeable clothing)	Level C, B, or A (Non-permeable clothing)
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°F (30.8° - 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° - 87.5°F (28.1° - 32.2°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° - 77.5°F (22.5° - 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Table 7
Wind Chill Chart

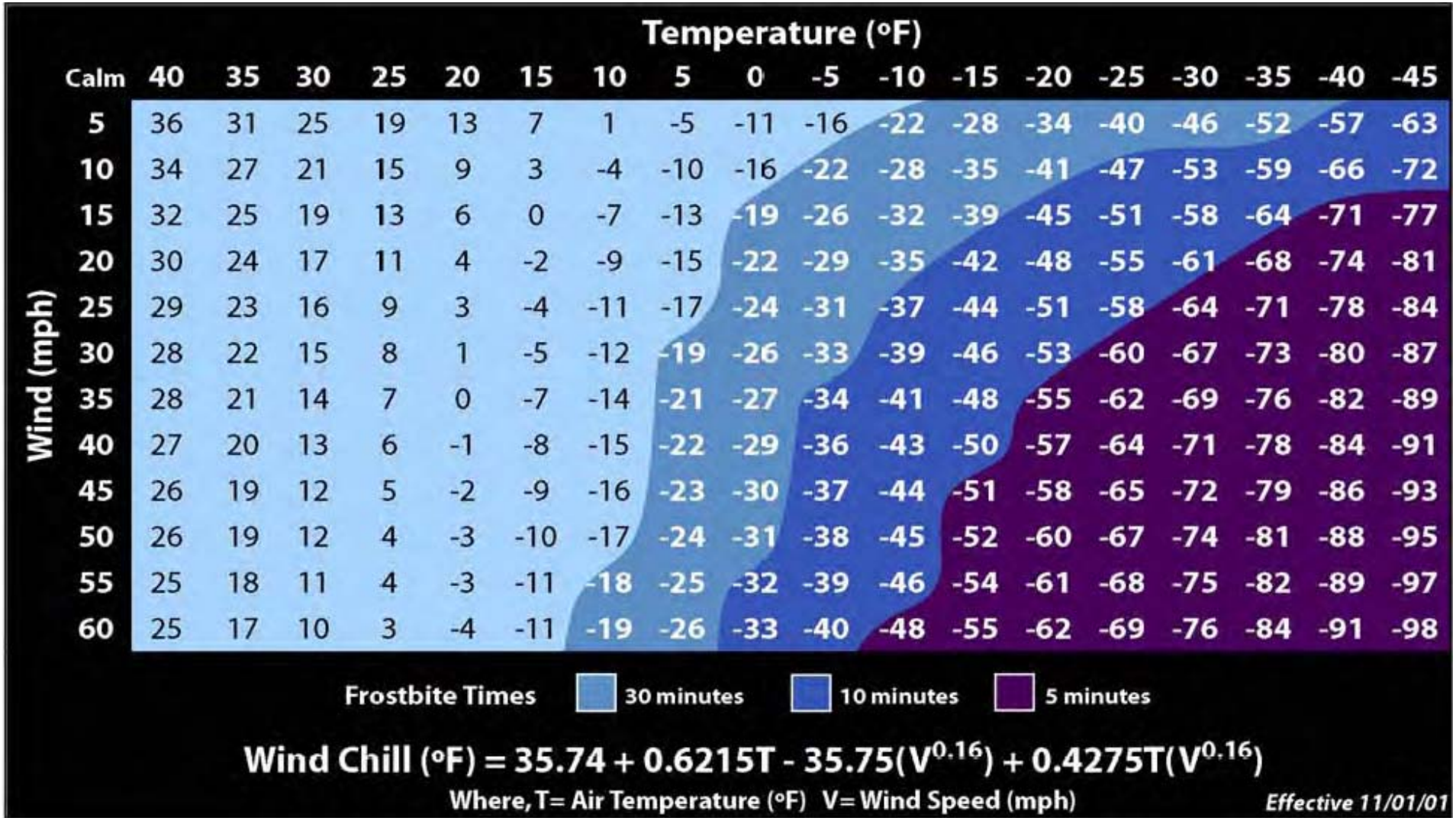

Table 8
Cold Work/Warm up Schedule for 4-Hour Shifts

Equivalent Chill Temperature	Maximum Work Period	No. of Breaks
≥ -24 °F	Normal	1
-25 to -30 °F	75 minutes	2
-31 to -35 °F	55 minutes	3
-36 to -40 °F	40 minutes	4
-41 to -45 °F	30 minutes	5
≤ -46 °F	Stop work	Stop work

Table 9
Emergency Equipment

Equipment	Location	Operation
First-aid kit	Support vehicle(s)	All operations
BBP kit	Support vehicle(s)	All operations
Eye wash	Support vehicle(s)	All operations
Air horn	Support vehicle(s)	All operations
Spill kit	Support vehicle(s)	All operations
10-lb fire extinguisher	Support vehicle(s)	All operations
Allergy response kit	Support vehicle(s)	All operations

Table 10
Contents for First Responder Kit 6626

Description	Qty	Description	Qty Max/Min
Ammonia Inhalants 10/Un	1 ea	Adhesive Strip, 7/8”x 3”	50/20
Bandage, Elastic, 3” x 5 yds	2 ea	Adhesive Strip, 7/8”x 1-1/2”	50/10
Bandage, Kerlix, Sterile, 4-1/2” x 4-1/2 yds	4 ea	Adhesive 1”	2/1
Bandage, Triangular 40” N/S 1/Un	3 ea	Gauze (Roll type - Kerlix), 2” and 4”	2/1
Clean Wipes, Alcohol Swabs 10/Un	1 ea	ACE Bandage	2/1
Cmprs, Multi Trauma Ster 10”x 30”	2 ea	3”x 3”	20/10
Disposable Plastic Emergency Blanket	1 ea	Goggles (Uvex Ultraspec 1000 or similar) pair	1/1
Elastic Roller Gauze N/S 3” x 4.5 Yd	3 ea	Antiseptic Swabs and/or Betadine Swabs, Box/10	2/1
Emergency First-Aid Pocket Guide	1 ea	Sterile Eyewash Solution	1/0
Eye Pads w/Adhesive Strips, 4/Unit	2 ea	Eye	20/10
Gauze Pads 4” x 4”, 10/Bx (Zee)	2 bx	Burn Gel	10/5
Ice Pack, Deluxe, Small (Zee)	2 ea	Water-Jel Burn Jel 6/Bx	1 ea
Nitrile Gloves, Large, 2 pairs	1 ea	Ammonia Ampules	5/2
PAM (Protective Airway Mask)	1 ea	Gloves, Surgical (Pr.)	5/2
Penlight, Medical Disposable	1 ea	CPR Shield	2/1
Scissors, Emergency	1 ea	Non-Aspirin	25/10
Sheer Strip 1”, 100/Box	1 bx	Insect Sting Kit (crushable ampules)	2/1
Sheer Strip Bandages XLG, 25/Box	1 bx	Alcohol-Foam Scrub - can	1/1
Sterile Dressing 5” x 9”	5 ea	Tape, 1” x 10 Yd. Spool (Zee)	2 ea
Tape, 2” x 5 Yd. 3 Cut Spool (Zee)	2 ea		

Table 11
Emergency Contact Numbers

Organization/Point of Contact	Telephone Number	Comment(s)
Ambulance Police/Security Med Evac Fire	911	
PeaceHealth Southwest Medical Center	(360) 256-2000	8716 East Mill Plain Boulevard Vancouver, WA 98664
Weston 24-hr Medical Emergency & Toxicological	1-800-874-4676 (bus. hours) 410-507-3325 or 770-826-6517 (after hours)	Will reach answering service; leave number to call back.
Spill Response- CHEMTREC	(800) 424-9300	
National Response Center	(800) 424-8802	
Poison Control Center	(800) 962-1253	
Clark County, WA POC – Greg Johnson	(360) 229-0529	
WESTON Medical Director: Dr. Peter Greaney WESTON Program Director: Michelle Bui	From 06:00 to 16:30 Pacific Time, call 800-455-6155, dial 0, or extension 175, to request the on-call clinician	Both at WorkCare
After-Business Hours Contact (Emergency Only)	16:31 to 05:59 PST, weekends/ holidays: (800) 455-6155; dial 3, to reach the after-hours answering service. Ask service to connect with on-call clinician or have clinician return call within 30 minutes.	
WESTON Emergency (24 hour) (West Chester)	(610) 701-3720	
EPA Region 10 Environmental Emergency Response	(800) 424-4372	
Call-Down: after 911, call ASAP		
Weston PM – *George Overby*	(864) 320-3409 (cell) (864) 399-9902	
Weston CSO – George Crawford	(484) 437-5976	
Weston Risk Management – Susan Hipp-Ludwick	(610) 701-3046	West Chester Office
Weston Health and Safety 24-hr Health & Safety	(610) 701-3000	or call Owen Douglass (610) 506-5392 cell

Table 12 Activity Hazard Analysis

Date Prepared: 5/11/2012

Prepared By: Michael Stuart

Reviewed By: George Crawford, CIH

Activity 1: **Pre-Mobilization**

***Overall Risk Assessment Code (RAC):**

RAC Matrix

Hazard Severity	Accident Probability A	B	C	D	E
I	E	E	H	H	M
II	E	H	H	M	L
III	H	M	M	L	L
IV	M	L	L	L	L

Task	Hazards	Hazard Control	RAC*
Repair of existing access road, Archaeological Assessment, and Layout of new access paths.	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex2, maintained on-site by the UXOSO.	L
	Biological Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP).	M
	Radiation Hazards:	Sun block will be provided to field personnel.	
	(non-ionizing only) Sun	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	M
	Physical Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	UXOSO will monitor temperature and adjust the work/rest cycle accordingly during field operations. Personnel will have access to radios and to vehicles with air conditioning. Plenty of drinking water will be present on site and personnel will be alert to heat stress symptoms in fellow workers. .	M
	Inclement weather, heat stress	UXOSO will monitor the temperature and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	M
	Hand tools, manual and power	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. All power circuits used for hand tools will be protected by a ground fault circuit interrupter (GFCI). All personnel will be trained on the proper use of all power tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where MEC is known to exist will be vacated. Any small fire (non-MEC) may be extinguished using a properly rated extinguisher. All storage, handling and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L

Table 12 Activity Hazard Analysis

Activity 2: Mobilization

Task	Hazards	Hazard Control	RAC*
Mobilization of manpower and equipment, establishment of work zone	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP Section 3.3 and Annex 2, maintained on-site by the UXOSO.	L
	Biological Hazards:	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.		M
	Radiation Hazards:	Sun block will be provided to field personnel. Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	
	(non-ionizing only) Sun		M
	Physical Hazards:	Personnel will have access to radios and to vehicles. Plenty of drinking water will be present on site and personnel will be alert to heat stress symptoms in fellow workers. .	
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.		M
	Inclement weather, heat stress	UXOSO will monitor the temperature and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	L
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Verify the path of travel is clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges and appropriate precautions shall be taken to avoid contact with rough or sharp edges. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual and power	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. All power circuits used for hand tools will be protected by a ground fault circuit interrupter (GFCI). All personnel will be trained on the proper use of all power tools.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where MEC is known to exist will be vacated. Any small fire (non-MEC) may be extinguished using a properly rated extinguisher. All storage, handling and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Electrical	Electrical installations for the trailer will be made by qualified electricians. The office trailer will be properly grounded.	L

Equipment	PPE	Inspection	Training
Hand tools Utility vehicles	Level D. If snakes are encountered, snake chaps will be provided to field personnel.	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers and first-aid kits will be inspected by the UXOSO.	First Aid/CPR and utility vehicle training. A minimum of a UXO Technician II will provide anomaly avoidance and UXO awareness training to non-UXO personnel.

Table 12 Activity Hazard Analysis

Activity 3: **Site Preparation Activities**

Task	Hazards	Hazard Control	RAC*
Site Preparation	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex 2, maintained on-site by the UXOSO.	L
	Biological Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	M
	Radiation Hazards:		
	(non-ionizing only) Sun	Sun block will be provided to field personnel. Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	M
	Physical Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work will be completed in adequate natural light or sufficient artificial illumination maintained. The “buddy system” will be implemented.	M
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel will be verified clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Hand tools, manual	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose.	L
	Inclement weather, heat stress	UXOSO will monitor the temperature and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH (American Conference of Governmental Industrial Hygienists), National Institute for Occupational Safety and Health (NIOSH) guidelines. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	M
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage or equipment refueling area, and strategically in the work areas.	L

Equipment	PPE	Inspection	Training
Vehicles Water Truck Utility vehicles GPS Radios	Safety boots Safety glasses Hearing protection High visibility safety vest	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer’s recommendations. Records of inspection will be maintained on-site. Fire extinguishers, first-aid kits and utility vehicles will be inspected by the UXOSO.	First Aid/CPR; and utility vehicle training. A minimum of a UXO Technician II will provide anomaly avoidance and UXO awareness training to non-UXO personnel.

Table 12 Activity Hazard Analysis

Activity 4: UXO Removal Activities

Task	Hazards	Hazard Control	RAC*
UXO technicians will conduct removal and transport of any and all potential visible MEC/MD/metallic items visible at the surface, including items protruding through the surface of the soil	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex 2, maintained on-site by the UXOSO.	L
	Explosives Hazards: Unintentional detonation of MEC including rocket motors and warheads, firebomb igniters, 20mm projectiles, and .50-caliber projectiles.	Establish exclusion zones (EZ) around intrusive work for nonessential personnel based on minimum separation distances identified in the approved ESS. Maintain exclusion zones during all intrusive activities. Munitions will be positively identified prior to movement. Positively identify any fuzing associated with the munitions. If found fuzed, do not handle. If unfuzed, it may be moved to central location with approval of UXOSO and concurrence from the USACE Ordnance and Explosives Safety Specialist (OESS). UXO operations will be conducted during daylight hours only. If unknown munitions or suspected CWM is found that cannot be positively identified, the USACE OESS will be notified, the detonation will be reassessed, and the course of action verified before proceeding. Approved ESS Amendment and EM 385-1-97 will be adhered to at all times. During transport of MEC/MPPEH/MD, Paragraph I.2.E of EM 385-1-97 “TRANSPORTATION OF MM ON-SITE” will be followed to ensure safe transport. Munitions with the greatest fragmentation distance (MGFD): **Stokes Mortar Target Area:** The MGFD is the 3-inch Stokes Mortars and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 225’, the MFD for intentional detonations is 1379’ and the Team Separation Distance (K40) is 52’. **MEC Disposal Area (Burial Pit):** The MGFD is the 75mm HE Mk I projectile and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 239’, the MFD for intentional detonations is 1873’ and the Team Separation Distance (K40) is 47’. **Open Burn/Open Detonation Area:** The MGFD is the 75mm HE Mk I projectile and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 239’, the MFD for intentional detonations is 1873’ and the Team Separation Distance (K40) is 47’. **37mm Artillery/Stokes Mortar Target Area:** The MGFD is the 3 inch Stokes Mortar and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 225’, the MFD for intentional detonations is 1379’ and the Team Separation Distance (K40) is 52’. **2.36-inch Rocket Target Area near Former Sewage Lagoons:** The MGFD is the 2.36-inch rocket and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 142’, the MFD for intentional detonations is790’ and the Team Separation Distance (K40) is 37’. **Rifle Grenade Area:** The MGFD is the M9A1 Rifle Grenade and based on the Fragmentation Database (4/2/12) the MFD for unintentional detonations is 113’, the MFD for intentional detonations is 709’ and the Team Separation Distance (K40) is 28’. **Associated Wetlands Area:** The MGFD is the 75mm HE Mk I projectile and based on the Fragmentation Database (4/12/12) the MFD for unintentional detonations is 239’, the MFD for intentional detonations is 1873’ and the Team Separation Distance (K40) is 47’. In the event that a different ordnance item of greater hazard is found, the MGFD will be recalculated and documentation will be updated.	H
	Explosives Hazards from Demolition Operations: Intentional detonation of MEC including rocket motors and warheads, firebomb igniters, 20mm projectiles, and .50-caliber projectiles.	Before any demolition operations commence, UXO technicians assigned to or working with demolition teams will attend a site-specific orientation and training. The purpose of the orientation will be to review UXO demolition and emergency response procedures. The topics to be covered during the orientation will include, but are not limited to: review of the ESS, APP and SSHP (as applicable), sandbag mitigation requirements, review of demolition firing systems and components, review of disposal charge placement, review of explosives, transportation, site munitions brief, type and condition of UXO, EZ requirements and control, emergency response equipment, emergency procedures, two person rule, team assignments. Engineering controls will be used as prescribed in the approved ESS. Demolition notifications will be made in accordance with the work plan. Demolition Supervisor will have current WA Blasters License. Approved ESS Amendment and EM 385-1-97 will be adhered to at all times.	H
	Biological Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	M
	Radiation Hazards:	Sun block will be provided.	
	(non-ionizing only) Sun	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	M

Table 12 Activity Hazard Analysis

Activity 4: UXO Removal Activities

Task	Hazards	Hazard Control	RAC*
UXO technicians will conduct removal and transport of any and all potential visible MEC/MD/metallic items visible at the surface, including items protruding through the surface of the soil	**Physical Hazards:**		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared from steps to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination maintained. The "buddy system" will be implemented.	M
	Manual lifting	Use proper lifting techniques such as keeping straight back, lifting with legs; avoid twisting back; use mechanical equipment or get help from others whenever possible. Heavy loads will be split into smaller loads and/or assistance sought. The path of travel will be verified clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations.	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges, and appropriate precautions shall be taken to avoid contact. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Inclement weather, heat stress	UXOSO will monitor the temperature and adjust the work rest schedule accordingly during field operations. Personnel shall be dressed according to weather conditions. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers. Work rest periods will be established according to ACGIH, NIOSH guidelines. Personnel will be monitored. Salt will be applied to walkway and roadway surfaces where ice is a problem. As determined by the UXOSO, operations are to cease during severe weather conditions. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning strikes are within 10 miles of the site.The UXOSO will monitor thunder and lightning activity with a hand held lightning detector. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather FLD05 – Heat Stress FLD11 – Rough Terrain FLD15 – Working in a Remote Area FLD21 – Explosives	M
	Noise exposure	High noise activities will be identified. Hearing protection will be provided as appropriate. The latest ACGIH threshold limit values (TLVs) will be used. Personnel operating chainsaws will use hearing protection. Hearing control program, which consists of audiometric examination; training; use of hearing protection; and sound level pressure monitoring when and where necessary.	L
	Fire	Flammable liquids will be stored in safety containers and flammable storage cabinets. Properly rated fire extinguishers will be placed within 50 ft of the fuel storage or equipment refueling area, and strategically in the work areas.	L

Equipment	PPE	Inspection	Training
Vehicles Water Truck Hand tools Utility vehicles	Safety boots High visibility vests Gloves Safety glasses.	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's requirements. Records of inspections will be maintained onsite. Fire extinguishers, first aid kits, and utility vehicles will be inspected by the UXOSO.	UXO/EOD certification, qualified in accordance with DDESB TP18, 40 hr-OSHA, 8-hr refresher, First Aid/CPR (at least 2 personnel); utility vehicle training.

Table 12 Activity Hazard Analysis

Activity 5: **Demobilization**

Task	Hazards	Hazard Control	RAC*
All equipment, materials, and personnel and temporary facilities will be removed from the site.	**Chemical Hazards:**	No chemical hazards are associated with this activity. However, fuels including gasoline and diesel will be utilized during fieldwork. Hazardous Materials brought on site for this work will be managed and used according to the Site Specific Hazard Communication Plan in the SSHP, Section 3.3 and Annex 2, maintained on-site by the UXOSO.	L
	Biological Hazards:	Use appropriate insect repellants. Personnel will be briefed regarding the site-specific biological hazards. If snakes are encountered, snake chaps will be provided to field personnel. The hazards and procedures for handling these hazards will be discussed prior to initiating the field activities. FLD43 – Biological Hazards, FLD44 – Blood borne Pathogens (BBP)	
	The risk level is expected to be moderate for this task given the location of the work area. Insects and snakes represent the most likely potential for biological hazards at the site.		M
	Radiation Hazards:	Use sun block as appropriate. Avoid direct exposure to sun for long periods of time.	
	(non-ionizing only) Sun		M
	Physical Hazards:		
	The risk level is expected to be moderate for this task given the location of the work area. Physical hazards of concern are those hazards associated with heat stress and most commonly associated with working in a rough terrain.	Slip, trip, and fall hazards shall be either removed or marked and barricaded. Materials will be stored to prevent intrusion into the work areas. Work areas will be kept organized; ice, snow, and mud will be cleared from steps to reduce slip hazards. Work will be completed in adequate natural light or sufficient artificial illumination will be maintained. Site personnel shall conduct an initial walkthrough, and the "buddy system" will be implemented.	M
	Manual lifting	Use proper lifting techniques—keep back straight, lift with legs, avoid twisting back, use mechanical equipment, or get help from others whenever possible. Split heavy loads into smaller loads and/or seek assistance. Verify the path of travel is clear prior to the lift.	M
	Hands or fingers caught between objects; abrasions and lacerations	Personnel shall be made aware of the hazard and asked to coordinate carefully the handling and placement of heavy objects. Materials and objects being handled will be inspected for rough or sharp edges and appropriate precautions shall be taken to avoid contact with rough or sharp edges. Personnel shall wear work gloves and avoid placing hands between objects.	L
	Fire	Fire prevention will be a priority through awareness. In the event of a fire, areas where UXO is known to exist will be vacated. Any small fire in an area that UXO is not present may be extinguished using a properly rated extinguisher. Storage, handling and use of flammables and combustible liquids will be in accordance with NFPA 30, 30A. Only labeled/listed containers will be used to store flammables and/or combustibles. Properly rated fire extinguishers will be strategically placed in the work area.	L
	Inclement weather, heat stress	UXOSO will monitor the temperature and adjust the work/rest cycle accordingly during field operations. Personnel shall be dressed according to weather conditions. Local weather will be monitored on a daily basis at a minimum or more frequently if storms threaten. Workers shall be briefed and cognizant of heat stress symptoms. Electrolyte/fluids replacement will be available to workers as needed. Work/rest periods will be established according to ACGIH and NIOSH guidelines. Personnel will be monitored. It is likely that ambient temperatures will exceed 100ºF based on the time of year. Personnel will dress accordingly and will have access to radios and vehicles with air conditioning. Plenty of drinking water will be on site and personnel will be alert to heat stress symptoms in fellow workers. No fieldwork will be performed if lightning or thunder are seen or heard within 10 miles of the site. Safety briefings will remind personnel of appropriate action for weather conditions. FLD02 – Inclement Weather, FLD05 – Heat Stress, FLD11 – Rough Terrain, FLD15 – Working in a Remote Area, FLD21 – Explosives	L
	Hand tools, manual and power	Tools shall be inspected prior to use. Damaged tools will be tagged out of service until repair can be performed by a qualified person. Tools will be used properly and for their intended purpose. All power circuits used for hand tools will be protected by a GFCI. All personnel will be trained on the proper use of all power tools.	L

Equipment	PPE	Inspection	Training
Hand tools Utility vehicles	Safety boots Gloves Safety glasses	All equipment will be properly stored, inspected, and/or maintained on a daily basis, or according to manufacturer's recommendations. Records of inspection will be maintained on-site. Fire extinguishers, first-aid kits, and vehicles utility will be inspected by the UXOSO.	First aid/CPR and utility vehicle training.

ATTACHMENT 1
SITE-SPECIFIC HAZARD COMMUNICATION PLAN/CHECKLIST

SITE-SPECIFIC HAZARD COMMUNICATION PLAN/CHECKLIST

To ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will utilize this checklist/document (or similar document) in conjunction with the WESTON Written Hazard Communication Program as a means of meeting site- or location-specific requirements.

While responsibilities for activities within this document are the primary responsibility of the WESTON Unexploded Ordnance Safety Officer (UXOSO), it is the responsibility of all WESTON and subcontractor personnel to ensure compliance. Responsibilities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON is known by all affected employees, the following hazard communication program has been established. All affected personnel will participate in the hazard communication program. This written program, as well as WESTON's Corporate Hazard Communication Program, will be available for review by any employee, employee representative, representative of Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH), or any affected employer/employee on a multi-employer site.

☐ Site or other location name/address: *Former Camp Bonneville Military Reservation*

☐ Project Manager: George Overby

☐ UXO Safety Officer: *Steve Bebow*

☐ List of chemicals compiled, format: HASP: ⊗ Other: _____

☐ Location of MSDS Files: Site Office

☐ Training Conducted by: Name: _____ Date: _____

☐ Indicate format of training documentation: Field Log: ☒ Other: Follow-up meetings

☐ Client briefing conducted regarding hazard communication: Entry

☐ If multi-employer site (client, subcontractor, agency), indicate name of affected companies:

_____

☐ Other employer(s) notified of chemicals, labeling, and MSDS information: All subs and vendors:

☐ Has WESTON been notified of other employer's or client's hazard communication program(s) as necessary?

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON and subcontractor personnel must be prepared and attached to this document or in a centrally identified location with the Material Safety Data Sheet (MSDS). Further information on each chemical may be obtained by reviewing the appropriate MSDS. The list will be arranged to enable cross-reference with the MSDS file and the label on the container. WESTON is responsible for ensuring the list of chemicals is current. Anticipated chemicals that will be used by WESTON on the CSE Phase II Surface Clearance include diesel fuel and gasoline.

Container Labeling

The UXOSO will verify that all containers received from the chemical manufacturer, importer, or distributor for uses on-site are clearly labeled.

The UXOSO is responsible for ensuring that labels are placed where required and for comparing MSDS and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDSs)

MSDSs will be obtained by WESTON for all hazardous materials to be used in performance of this contract in accordance with Federal Acquisition Regulation (FAR) 52.223-3. These MSDSs and an inventory of hazardous material will be compiled prior to bringing the material on-site. MSDSs will be maintained at the job site and available to all employees and inspectors. The subcontractor must have an active Hazardous Communication Program in place for all employees as required by Code of Federal Regulations (CFR) 29 CFR 1910.1200. To assist this effort, the UXOSO is responsible for establishing and monitoring WESTON's MSDS program for the location. The UXOSO will ensure procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. He/she will inform affected employees of any new information. If an MSDS is not received at the time of initial shipment, the UXOSO will contact the manufacturer and request delivery of an MSDS for that product, in accordance with the requirements of WESTON's Written Hazard Communication Program.

WESTON will maintain an MSDS file that contains a log of, and copies of, MSDSs for all hazardous chemicals in use at the site, and inform all site workers of the file's location. MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON UXOSO or designated alternate. When a revised MSDS is received, the UXOSO will immediately replace the old MSDS.

Employee Training and Information

The UXOSO is responsible for the WESTON site-specific personnel training program. The UXOSO will ensure that the following program information is supplied to all affected employees.

At the time of initial assignment for employees to the work site or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below:

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- Signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and written hazard communication program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.

- How to read labels and review MSDSs to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, and PPE.
- Hazardous, non-routine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Non-Routine Tasks

When employees are required to perform hazardous non-routine tasks, the UXOSO will provide affected employee(s) with information about the hazardous chemicals he or she may be using during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Multi-Employer Worksites

The UXOSO is responsible for providing other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. The UXOSO and the Site Manager are responsible for obtaining information about hazardous chemicals used by other employers and that WESTON employees may be exposed to. WESTON's chemical list will be made available to other employers upon request. MSDSs will be provided as necessary.

The location, format, and/or procedures for accessing MSDS information must be relayed to affected employees.

ATTACHMENT 2
HAZARDOUS CHEMICAL LIST/MATERIAL SAFETY DATA SHEETS

Hazardous Chemicals
Potentially Brought to Site

The hazardous materials that may be used on-site are presented in the following list, and Material Safety Data Sheets (MSDSs) for all reagent type chemicals, solutions, or other identified materials will be available on-site. All subcontractors and other parties working nearby will be informed of the presence of these chemicals and the location of the MSDSs.

Chemical Name	Quantity
Hand Sanitizer	24 16-oz bottles
Gasoline	2 gallons
Lubricating oil	1 bottle
Lead Acid Marine Battery	1 Battery
Air Horn	1 each

MATERIAL SAFETY DATA SHEETS

ATTACHMENT 2
RESUMES FOR IDENTIFIED SAFETY PERSONNEL

GEORGE CRAWFORD, CIH

Qualifications Summary

- 30 years of overall experience managing H&S on environmental projects, which have included spill response, uncontrolled site investigations, and remediation (surface-water treatment for multiple VOCs, excavation and transportation of pesticides, and surface soil contaminated with dioxin).
- 27 years managing and implementing program/ project-level H&S under OSHA, EM 385-1-1, and related safety regulations. Presented more than 80 OSHA 40-hour hazardous waste site training courses, and 200 refresher/site supervisor courses.
- CIH of Record on 220+ DOD TOs involving HTRW investigation, study, design, and remedial action activities. Responsible for more than 2 million hours for DOD projects with no lost time. CIH of Record for Region 5 START and H&S Manager for the Region 3 START contracts.
- Member of the OSHA EPA National Response Team H&S Committee for 15 years, and received EPA's Bronze Medal for commendable service.
- Directs corporate air-monitoring program and reviews air-monitoring data and accident reports weekly. 29 years of experience with air-monitoring techniques and in development of respiratory protection and PPE programs for working in potentially toxic atmospheres.

Roles and Responsibilities

- Corporate Health and Safety. Ensures all planning and execution is conducted according to Weston safety policies and procedures. Provides support to the safety oversight team.

Registration

Certified in the Comprehensive Practice of Industrial Hygiene, American Board of Industrial Hygiene (#4207; 1989); Recertified (1996; 2002)

Education

B.A., Business Management—University of Maryland (Ongoing)
EOD School, U.S. Navy (1988)
Dive School, U.S. Navy (1987)
B.S., Biology—Juniata College (1967)
40-Hour Hazardous Waste Operations & Emergency Response (1994); 8-Hour Refresher (2011)

Credentials

40-Hour Hazardous Waste Site Training Course, OSHA 29 CFR 1910.120(e)(3), WESTON (1987)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (1999)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29 CFR 1910.120(e)(4), WESTON (1999)
10-Hour Construction Safety Training, OSHA 29 CFR 1926, WESTON (1997)
American Industrial Hygienists Association (AIHA)
Special Interest Group, Engineering Industry, AIHA
AIHA Confined Space Entry Committee
OSWER and Labor, Health, and Safety Joint Task Force

Employment History

1982-Present WESTON [11-83 to Present; West Chester, PA; Technical Director, Division EHS Manager]
1980-1982 Rollins Environmental Services [10-80 to 11-83; NJ]
1969-1980 Pennsylvania Department of Environmental Resources [9-69 to 10-80]
1967-1969 Columbia University Medical Ctr [6-67 to 8-69; NY]

Key Projects

H&S Management, EPA Regions 3 and 5 START Contract, HSM/CIH. Provides technical direction for implementation of Regions 3 and 5 START H&S program, including development and review of air-monitoring strategies, as well as training in use

Key Projects (Continued)

of air-monitoring instruments and air sampling; and development and review of respiratory protection programs, including training in use of respiratory protection. Reviews and approves all HASPs.

Housatonic River Project, Pittsfield, MA, EPA Region 1 and USACE New England District, CIH. Developed and implemented the H&S program for this 5-year, $150M PCB removal action; performed initial site-specific training; directed air-monitoring program; assists project superintendents in implementing the H&S program. Supervised the activities of the SSHO, who reports directly to him. Reviewed and approved all SSHPs and amendments. Performed reviews of safety program with Program Manager. Instituted self-safety audits with no safety incidents recorded. WESTON received USACE's Safety Contractor of the Year Award.

H&S Management, Spill Prevention and Emergency Response (ER) Technical Assistance Team (TAT) Multimillion Dollar Contract, New Jersey, EPA, Division Safety Officer. As the H&S Manager for the cost-reimbursable, cradle-to-grave TAT contract, implemented the H&S program, trained personnel for ER and hazardous materials site safety, audited conformance with the program, and assisted with management of the Corporate H&S Program. Supervised 17 Safety Officers at various offices nationwide for 3 years (Safety Levels A, B, C, D).

4 Navy Contracts – U.S. Navy, ESCA, Former Mare Island Naval Shipyard, City of Vallejo, CA; 2 NAVFAC SW EMACs; and NAVSEA Quick Response Contract, ESH Manager. Developed EHS Program SSHPs, including submittals approved by Cal OSHA for $55M ESCA. All projects were safely performed in NAVFAC SW AOR. Achieved 300,000 work hours without a lost-time incident.

RANDY SCHNEIDER

Qualifications Summary

- Randy Schneider has 15 years of experience as a UXO safety officer, and will ensure a safe work environment at Camp Bonneville. His participation in developing a zero-incident culture corporate-wide within Weston has resulted in a ***perfect record of zero MEC-related safety incidents.***

Roles and Responsibilities

- **Accountable for development and implementation of approved UXO and explosives safety in compliance with all DOD, federal/state/local statutes/codes.**
- Develops/executes APP/SSHP per USACE EM 385-1-1/Weston SOPs.
- OESS liaison.
- Trains/works with team to meet all H&S goals; conveys H&S hazards at daily tailgate meetings, inspects site, gives feedback to PM/SUXOS.
- Enforces staff limits/safety exclusion zones for MEC operations; conducts safety inspections to ensure compliance with UXO and safety codes.
- **Stops work if necessary to resolve technical, quality, safety, or regulatory issues.**

Registration

UXO Certification No. 1149, USACE Huntsville Center
Certified Safety Trained Supervisor (STS), Board of Certified Safety Professionals
Field Safety Officer Certification (2009)

Education

Explosives Ordnance Disposal Training, U.S. Naval School (1996)
Advanced Access and Disablement Course (1999)
40-Hour HAZWOPER Training Course (2001); 8-Hour Hazardous Waste Refresher (2011)
8-Hour Managers and Supervisors Course, (2009)
30-Hour Construction Industry Outreach Training Program (2009) Explosive Drivers Course, (2011) ASNT Level II Radiographer, Joint Nuclear EOD Course (1999)

Credentials

U.S. Naval School Explosive Ordnance Disposal, Phase I/II(1996)
U.S. Army Explosive Ordnance Disposal, Phase III (1996)
Advanced Access and Disablement Course, (1999)
40-Hour HAZWOPER Training Course, OSHA 29 CFR 1910.120(e)(3), North Pacific EOD, (2001)
8-Hour Hazardous Waste Refresher On-Line Course (2012)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29 CFR 1910.120(e)(4), USA Environmental, Inc. (2009)
Behavior Based Safety, Phase 1 Training, WESTON (2012)
Joint Nuclear EOD Training, Sandia National Laboratories (1999)
Rigging Safety, Bristol Environmental (2012)
First Aid/CPR, American Red Cross (2012)
Emergency Medical Technician (2002)

Employment History

Present	Weston Solutions, Inc., UXO Safety Officer
2011-2012	Bristol Environmental and Restoration, UXOQCS
2009-2011	USA Environmental, Inc., UXOQCS
2007-2009	PIKA International, Inc., Site Manager

UXO Safety Officer, Camp Bonneville Military Reservation, WA. Conducts safety audits of Weston's current project. Inspected all facets of project execution to ensure compliance with work plan, and federal and state regulations.

UXO Quality Control Specialist, Training Area 6 Joint Base Lewis McChord, WA. Responsible for oversight of all activities, including tree and vegetation removal, MEC intrusive investigations, and UXO removal and disposal operations. Conducted frequent audits to ensure compliance with applicable work and quality control plans.

UXO Quality Control Specialist, Vieques Naval Training Range, PR. Performed quality control audits on all definable features of work. Ensured that all work was in accordance with the work plan and Explosive Safety Submission. Conducted QC audits of over thirty percent of all subsurface targets investigated in the Munitions Response Area.

Site Manager, Camp Bonneville Military Reservation, WA. Responsible for all field activities and personnel during execution of the Roads and Trails and the Central Valley Floor surface clearance tasks. Managed all logistics for the project to include explosive management, vehicle acquisition and staffing.

MICHAEL STUART

Qualifications Summary

- Certified as Site Health & Safety Coordinator, OSHA 29 CFR 1910.120(e)(4).
- Has over 12 years of experience providing H&S oversight, safety training, conducting safety audits, and assisting with mitigation plans.

Roles and Responsibilities

- **Accountable for assuring safety planning, execution, and reporting conform to corporate standards**.
- Provides project H&S oversight.
- Internal authority with independent reporting line to address safety concerns and take corrective action.
- Performs safety audits to ensure compliance with OSHA and Weston safety requirements.
- **Stops work if necessary to resolve technical, quality, safety, or regulatory issues.**

Education

B.S., Business Management—University of Maryland (1994)
OSHA 40-Hour HAZWOPER (1998); 8-Hour Refresher (2009)
40-Hour Safety Course and Jumpstart Course, EM 385-1-1, USACE
Defense Special Weapons Agency Hazard Analysis and Risk Assessment (1997)
30-Hour OSHA Construction Course
Material Safety Data Sheets Training for the Non-Chemist (1997)
RCRA Awareness Training (1996)
OSHA Competent Person Training for Excavation/Trenching; Fall Protection; Confined Space Entry Rescue & Non-Entry Rescue (2001)
DOT/IATA Hazardous Materials Training; Hazardous Waste Management and Shipping for Environmental Professionals (2001)

Credentials

40-Hour Safety Course, EM 385-1-1, USACE
10-Hour Jumpstart Course, EM 385-1-1, USACE
30-Hour OSHA Construction Course
OSHA 500 Trainer Course for the Construction Industry
OSHA Competent Person Training for Excavation/Trenching
Hazardous Waste Management and Shipping for Environmental Professionals, 40 CFR 265.16, Eduwhere (2001)
Taproot Accident Investigation Course, WESTON (2001)
DOT/IATA Hazardous Materials Training, 49 CFR 172 Subpart H, Renchem (2001)
Ergonomic Evaluation Certification Program, Roy Matheson (2000)
OSHA 500 Occupational Safety for the Construction Industry Course, (2000)
8-Hour Hazardous Waste Refresher Course, OSHA 29 CFR 1910.120(e)(8), WESTON (2009)
8-Hour Managers and Supervisors Course (SHSC), OSHA 29 CFR 1910.120(e)(4), WESTON (2000)
Adult First Aid and CPR, WESTON (1999)
Bloodborne Pathogens Training, OSHA 29 CFR 1910.1030, WESTON (2003)
40-Hour EPA HAZWOPER Course, OSHA 29 CFR 1910.120(e)(8), TetraTech (1998)

Material Safety Data Sheets Training for the Non-Chemist, (1997)
OSHA 600 Collateral Duty Course, (1997)
Situation Leadership Awareness Training (1996)
Advanced Leadership/Management, Senior NCO Officer Academy (1994)
FEMA Hazardous Materials Contingency Planning, Emergency Management Institute (1994)
Hazardous Materials and Waste Control (1992)
Facilities Manager Course (1992)

Employment History

1999-Present	WESTON [5-99 to Present; Albuquerque, NM; Division Environmental Health and Safety Manager]
1991-1999	Defense Threat Reduction Agency/U.S. Air Force
1975-1991	U.S. Air Force

Key Projects

Site H&S Manager, MEC Remediation, Environmental Services, and Site Closure, Fort Ord, CA. Responsible for H&S planning, oversight, and reporting during MEC remediation. This NPL site is in proximity to residential properties; all operations require sensitivity to noise, dust, and safety. All work complied with the work plan, and federal and state regulations. Safely completed >124,485 work-hours to date.

H&S Manager, Time Critical Removal Action, Marine Corps Firing Range, Mare Island, CA. Responsible for H&S planning and oversight of remediation projects at multiple locations. Oversaw H&S during hazardous waste removal, installing groundwater treatment system, and capping 72-acre 1A H1 containment area with >600K yd^3 of soil and geosynthetic liner. Conducted H&S audits; supported site Behavior Based Safety Program.

H&S Manager, Pier A West Interim Source Removal. Long Beach, CA. Assessed and addressed potential contaminants, dust, and noise exposure of team, site visitors, workers, and the community during excavation of 400,000 tons of contaminated material; transportation and disposal of material to landfills; and treatment of 2.7M gallons of contaminated groundwater. Provided H&S audits for the 123-acre site. Despite ≤ 600 trucks accessing site daily, performed 288,000 man-hours without one lost-time or reportable incident.

H&S Manager, Treatment of Metals-Contaminated Soils, Campbell Shipyard, San Diego, CA, Port of San Diego. Responsible to ensure personnel were H&S trained, and had proper tools and equipment to perform work. Implemented extensive daily air sampling and direct-read monitoring at three separate locations along the site boundary due to the proximity of adjacent client buildings and the San Diego Convention Center.

ATTACHMENT 3
ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

Project Name: _____

Inspector: _____

Submit to: _____

Date: _____

THE WESTON SITE APPEARANCE

YES	NO		COMMENT
		Is the site secured to prevent inadvertent, unnecessary, or unauthorized access? Are gates closed and locked at any time that the access point is not occupied or visible to site workers?	
		Are access points posted with signs to indicate client and end-user client name, WESTON's name and logo, names of other contractors and sub-contractors, project name and location, and appropriate safety messages?	
		Are required postings in place (e.g., Labor Poster, Emergency Phone Numbers, Site Map, etc.)?	
		Are site trailers tied down per local code and provided with stairs that have a landing platform with guard and stair railings?	
		Is a Site Safety file system established in the office to maintain records required by applicable safety regulations	
		Is the Health and Safety Plan (HASP) or Accident Prevention Plan (APP) amended as scope of work changes, hazards are discovered or eliminated or if risk change?	
		Is the Site Safety Plan and the Safety Officers Field Manual on site?	
		Is new employee indoctrination provided?	
		Have site Rules been provided, discussed and signed off on by all employees	
		Incident Reporting procedure explained to all?	
		Is site management trained in the WESTON (and client as applicable) Incident Reporting system?	
		Are NOI and Supplemental Report forms and OSHA 300 Log available on site?	
		Is Site Management aware of the Case Management and Incident Investigation Procedures?	
		Is there a list of preferred provider medical facilities available?	
		Has the "Inspection By A Regulatory Agency" procedure been reviewed by all site management?	
		Will Competent Persons be required because of activities to be performed, equipment to be used or hazards to be encountered?	

POLICIES

YES	NO		COMMENT
		Each individual employee is aware that he or she responsible for complying with applicable safety requirements, wearing prescribed safety equipment and preventing avoidable accidents.	
		Do employees understand that they will wear clothing suitable for existing weather and work conditions and the minimum work uniform will include long pants, sleeved work shirts, protective footwear, hard hat, and safety glasses unless otherwise specified via the HASP.	
		Are employees provided safety and health training to enable them to perform their work safely ? Is all training documented to indicate the date of the session, topics covered, and names of participants?	
		Safety meetings are conducted daily. The purpose of the meetings are to review past activities, review pertinent tailgate safety topics and establish safe working procedures for anticipated hazards encountered during the day.	
		Training has been provided to all personnel regarding handling of emergency situations that may arise from the activity or use of equipment on the project.	
		Employees/contractors are informed and understand that they may not be under the influence of alcohol, narcotics, intoxicants or similar mind-altering substances at any time. Employees found under the influence of or consuming such substances will be immediately removed from the job site.	
		Site workers and operators of any equipment or vehicles are able to read and understand the signs, signals and operating instructions of their use.	
		Have contractors performing work provided copies of relevant documentation (such as medical fit-for-duty, training certificates, fit-tests, etc.) prior to initiation of the project?	

SANITATION
29 CFR 1926 Subparts C, D. EM 385-1-1, Section 2

YES	NO		COMMENT
		Is an adequate supply of drinking water provided. Is potable/drinking water labeled as such? Are there sufficient drinking cups provided?	
		Is there a sufficient number of toilets?	
		Are washing facilities readily available and appropriate for the cleaning needs?	
		Are washing facilities kept sanitary with adequate cleansing and drying materials?	
		Waste is secured so as not to attract rodents, insects or other vermin?	
		Is an effective housekeeping program established and implemented?	

ACCIDENT PREVENTION SIGNS, TAGS, LABELS, SIGNALS, AND PIPING SYSTEM IDENTIFICATION
29 CFR 1926 Subpart G. EM 385-1-1, Section 8

YES	NO		COMMENT
		Are signs, tags, and labels provided to give adequate warning and caution of hazards and instruction/directions to workers and the public?	
		Are all employees informed as to the meaning of the various signs, tags and labels used in the workplace and what special precautions are required?.	
		Are construction areas posted with legible traffic signs at points of hazard?	
		Are signs required to be seen at night lighted or reflectorized?	
		Tags contain a signal word (“danger” or “caution”) and a major message to indicate the specific hazardous condition or the instruction to be communicated to the employee. Tags follow requirements as outlined in 29 CFR 1926.200.	

MEDICAL SERVICES AND FIRST AID
29 CFR 1926 Subparts C, D. EM 385-1-1, Section 3

YES	NO		COMMENT
		Is a local medical emergency facility (LMEF) identified in the HASP or APP?	
		Has the LMEF been visited to verify the directions and establish contacts?	
		Has site management reviewed WESTON’s incident management procedures?	
		Have clinics and specialists that will help WESTON manage injuries and illnesses been identified?	
		Is there at least two (2) people certified in First Aid and CPR?	
		Are first aid kits available at the command post and appropriate remote locations?	
		Are first Aid Kits and Eyewash/Safety Showers inspected weekly?	
		Are 15 minute eyewash/safety showers in place if required.	

FIRE PREVENTION AND PROTECTION
29 CFR 1926 Subpart F. EM 385-1-1, Section 9

YES	NO		COMMENT
		Is an Emergency Response and Contingency Plan in place?	
		Are emergency phone numbers posted?	
		Are fire extinguishers selected and provided based on the types of materials and potential fire classes in each area.	
		Are fire extinguishers provided in each administrative and storage trailer, within 50 ft but no closer than 25 ft of any fuel or flammable liquids storage, on welding and cutting equipment, on mechanical equipment?	
		Are fire extinguishers checked daily and inspected monthly?	
		Do site personnel know the location of fire extinguishers and how to use them?	
		Are flammable and combustible liquids stored in approved containers?	
		Safety cans are used for dispensing flammable or combustible liquids in 5 gallon or less volumes.	
		Are flammable and combustible liquids stored in flammable storage cabinets or appropriate storage areas?	
		Are flammable materials separated from oxidizers by at least 20 feet (or 5 foot tall, ½ -hour rated fire wall) when in storage?	
		Are fuel storage tanks double walled or placed in a lined berm?	
		Spills are cleaned up immediately and wastes are disposed of properly.	
		Combustible scrap, debris and waste material (oily rags) are stored in closed metal containers and disposed of promptly.	
		Vehicle fueling tanks are grounded and bonding between the tank and vehicle being fueled is provided?	
		LPG is stored, handled and used according to OSHA regulations 29 CFR 1926.	
		LPG cylinders are not stored indoors.	
		Is a hot work permit program in place? See WESTON FLD-36	
		Is smoking limited to specific areas, prohibited in flammable storage areas and are signs posted to this effect?	

HAZARDOUS SUBSTANCES, AGENTS AND ENVIRONMENTS
29 CFR 1926 Subparts D, Z. EM 385-1-1, Sections 6, 28

YES	NO		COMMENT
		Are operations, materials and equipment evaluated to determine the presence of hazardous contaminants or if hazardous agents could be released in the work environment?	
		Are MSDS for substances made available at the work-site when any hazardous substance is procured, used, or stored?.	
		Are all containers and piping containing hazardous substances labeled appropriately?	
		Is there an inventory of hazardous substances?	
		Is there a site Specific Hazard Communication Program?	
		Spill kits appropriate for the hazardous materials present are on site and their location is known to spill responders.	
		Is disposal of excess hazardous chemicals performed according to WESTON's guidelines and RCRA regulations.	
		Before initiation of activities where there is an identified asbestos or lead hazard, is there a written plan detailing compliance with OSHA and EPA asbestos or lead abatement requirements? Does the plan comply with state and local authority, and USACE requirements, as applicable?	
		Are personnel trained and provided with protection against hazards from animals, poisonous plants and insects?	

PERSONAL PROTECTIVE AND SAFETY EQUIPMENT, RESPIRATORY AND FALL PROTECTION
29 CFR 1926 Subparts D, E, M. EM 385-1-1, Section 5

YES	NO		COMMENT
		Do employees understand that the minimum PPE is hard hat, safety glasses with side shields and safety shoes or boots and that long pants and a sleeved shirt are required?	
		Has the SSHC reviewed the PPE requirements in the HASP against actual site conditions and certified that the PPE is appropriate? (see Field Manual, PPE Program)	
		PPE is inspected, tested and maintained in serviceable and sanitary condition as recommended by the manufacturer. Is defective or damaged equipment taken out of service and repaired or replaced?	
		Are workers trained in the use of the PPE required?	
		Are personnel exposed to vehicular or equipment traffic, including signal persons, spotters or inspectors required to vests or apparel marked with a reflective or high visibility material?	
		Is there a noise hazard? If yes, hearing protection will be required.	
		Is there a splash or splatter hazard? Face shields or goggles will be required.	
		Will personnel be working in or over water? Personnel Floatation devices will be required.	
		Is there a welding hazard? Welding helmet and leathers will be required. Is there a cutting torch hazard? Goggles and protective clothing will be required.	
		Is each person on a walking/working surface with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level protected from falling by the use of guardrail systems, safety net systems or personal fall arrest systems? See WESTON FLD 25 (Note General Industry standard is four feet).	
		Guardrail systems are used as primary protection whenever feasible. Guardrail construction meets criteria in 29 CFR 1926.502(b).	
		Personal fall arrest systems (PFAS) are inspected and appropriate for use.	
		Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses are from synthetic fibers.	
		Safety nets and safety net installations are constructed, tested and used according to 29 CFR 1926.502.c	
		Is respirator use required? See WESTON Respiratory Protection Program	
		Persons using respiratory protection have been successfully medically cleared, trained and fit tested.	
		Respirators are used according to the manufacturer's instructions, regulatory requirements, selection criteria and health and safety plan provisions.	
		For Level C operations with organic vapor contamination, is the cartridge change-out schedule documented?	
		Is breathing certified as Grade D, or better, and certification available on-site?	

MACHINERY AND MECHANIZED EQUIPMENT
29 CFR 1926 Subparts N, O. EM 385-1-1, Sections 16, 17, 18

YES	NO		COMMENT
		Are inspections of machinery by a competent person established?	
		Is equipment inspected daily before its next use?	
		Equipment inspection reports are reviewed, followed-up on negative findings and records of inspections are maintained?	
		Machinery or equipment found to be unsafe is taken out of service until the unsafe condition has been corrected.	
		Is there a preventive maintenance program established?	
		Are operators of equipment qualified and authorized to operate?	
		Is all self-propelled construction and industrial equipment equipped with a reverse signal alarm?	
		Are seats or equal protection provided for each person required to ride on equipment. Are seatbelts installed and worn on motor vehicles, as appropriate.	
		All equipment with windshields is equipped with powered wipers. If fogging or frosting is possible, operable defogging or defrosting devices are required.	
		Internal combustion engines are not operated in enclosed areas unless adequate ventilation are made. Air monitoring is conducted to assure safe working conditions.	
		Is each bulldozer, scraper, dragline, crane, motor grader, front-end loader, mechanical shovel, backhoe, or similar equipment equipped with at least one dry chemical or carbon dioxide fire extinguisher with a minimum rating of 5-B:C?	
		Will cranes or other lifting devices be used? If so, are the following documents available on site: 1) a copy of the operating manual, 2) load rating chart, 3) log book, 4) a copy of the last annual inspection and 5) the initial on-site inspection?	
		Do operators have certificates of training to operate the type of crane(s) to be used?	
		Is a signal person provided when the point of operation is not in full view of the vehicle, machine or equipment operator? When manual (hand) signals are used, is only one person designated to give signals to the operator?	
		Signal persons back one vehicle at a time. While under the control of a signal person, drivers do not back or maneuver until directed. Drivers stop if contact with the signal person is lost.	
		Is a critical lift plan prepared by a competent person whenever: a lift is not routine, or a lift exceeds 75% of a crane's capacity, a lift results in the load being out of the operator's line of sight, or a lift involves more than one crane, a man basket is used, or the operator believes there is a need for a critical lift plan.	
		Fork Lifts (Powered Industrial Trucks) - Will forklifts be used on site?	
		All fork lifts meet the requirements of design, construction, stability, inspection, testing, maintenance and operation as indicated in ANSI/ASME B56.1 Safety Standards for Low Lift and High Lift Trucks.	
		Do forklift operators have certificates of training?	
		Are pile driving operations conducted according to EM 385-1-1, Section 16.L?	
		Is drilling equipment operated, inspected, and maintained as specified in the manufacturer's operating manual? Is a copy of the manual available at the work-site? See also the Drilling Safety Guide in the Safety Officers Field Manual.	
		Are flag persons provided when operations or equipment on or near a highway expose workers to traffic hazards? Do flag persons and persons working in proximity to a road wear high visibility vests? Are persons exposed to highway vehicle traffic protected by signs in all directions warning of the presence of the flag persons and the work? Do signs and distances from the work zone conform to federal and local regulations?	

MOTOR VEHICLES
29 CFR 1926 Subpart O. EM 385-1-1, Section 18

YES	NO		COMMENT
		Motor vehicle operators have a valid permit, license, or certification of ability for the equipment being operated.	
		Inspection, maintenance and repair is according to manufacturer's requirements by qualified persons.	
		Vehicles are inspected on a scheduled maintenance program.	
		Vehicles not in safe operating condition are removed from service until defects are corrected.	
		Glass in windshields, windows, and doors is safety glass. Any cracked or broken glass is replaced.	
		Seatbelts are installed and worn.	
		The number of passengers in passenger-type vehicles does not exceed the number which can be seated.	
		Trucks used to transport personnel have securely anchored seating, a rear endgate, and a guardrail.	
		No person is permitted to ride with arms or legs outside of a vehicle body; in a standing position on the body; on running boards; seated on side fenders, cabs, cab shields, rear of the truck or on the load.	
		ATV operators possess valid state drivers license, have completed an ATV training course prior to operation of the vehicle, and wear appropriate protective equipment such as helmets, boots, and gloves.	

EXCAVATING AND TRENCHING
29 CFR 1926 Subpart P. EM 385-1-1, Section 25

YES	NO		COMMENT
		Has the known or estimated location of utility installations such as sewer, telephone, fuel, electric, water lines, or any other underground installations that may be expected to be encountered during excavation been determined before excavation? Have utility locations been verified by designated state services according to state regulations? Has the client provided clearance where state jurisdiction doesn't apply?	
		Have overhead utilities in excavation areas been identified and either de-energized, shielded or barricaded so excavating equipment will not come within 10 feet?	
		Are inspections of the excavation, the adjacent areas, and protective systems made daily and as necessary by a competent person?	
		Are Protective systems in place as prescribed by the competent person?	
		Is material removed from excavations managed so it will not overwhelm the protective systems?	
		Are barriers provided between excavations and walkways?	
		Are excavations by roadways barricaded to warn vehicles of presence or to prevent them from falling in?	
		Is there a means of exit from the excavation every 25 feet?	
		Is air monitoring required? If yes, Is it performed?	

CONFINED SPACES
29 CFR 1910 Subpart J. EM 385-1-1, Section 6

YES	NO		COMMENT
		Is there a Confined Space Entry Program in place?	
		Are the confined Spaces identified and labeled?	
		Will the Confined Spaces be entered?	
		Is appropriate entry documentation used and on-file?	

ELECTRICAL
29 CFR 1926 Subpart K. EM 385-1-1, Section 11

YES	NO		COMMENT
		Are electrical installations made according to the National Electrical Code and applicable local codes?	
		Qualified electricians make all connections and perform all work within 10 feet of live electric equipment.	
		Location of underground, overhead, under floor, behind wall electrical lines is known and communicated. Lines are documented by qualified person as de-energized where necessary.	
		Workers understand they must not work near live parts of electric circuits, unless they are qualified as required by OSHA or are protected by de-energizing and grounding the parts, guarding the parts by insulation, or other effective means?	
		Employees who regularly work on or around energized electrical equipment or lines are instructed in the cardiopulmonary resuscitation (CPR) methods.	
		Workers are prohibited from working alone on energized lines or equipment over 600 volts.	
		Are Ground-fault circuit interrupters (GFCI's) or is ground fault circuit protection provided to protect employees from ground-fault hazards for all 115 – 120 Volt, 15 and 20 amp receptacle outlets which are not a part of the permanent wiring of a building or structure at construction sites?	
		Circuit breakers are labeled.	
		Circuit breaker and all cabinets with exposed electric conductors are kept tightly closed.	
		Unused openings (including conduit knockouts) in electrical enclosures and fittings are closed with appropriate covers, plugs or plates.	
		Sufficient access and working space is provided and maintained about all electrical equipment to permit ready and safe operations and maintenance.	
		Motors are located within sight of their controllers or controller disconnecting means are capable of being locked in the pen position or is a separate disconnecting means installed in the circuit within sight of the motor.	
		Are visual inspections of extension cords and cord-and plug-connected equipment conducted daily? Is equipment found damaged or defective tagged and removed from service, and not used until repaired?	
		Wet Areas - Is portable lighting used in wet or conductive locations, such as tanks or boilers operated at no more than 12 volts and protected by GFCIs.	
		Are electrical installations in hazardous areas to NEC?	
		Metal ladders and tools including tape measures or fabric with metal thread are prohibited where contact with energized electrically parts is possible.	
		All extension cords are the three-wire type, designed and rated for hard or extra hard usage?	
		Worn or frayed electrical cords or cables are taken out of service. Fastening with staples, hanging from nails or suspending extension cords by wire is prohibited.	
		Electric wire/flexible cord passing through work areas is protected from damage such as foot traffic, vehicles, sharp corners, projections and pinching? Flexible cords and cables passing through holes are protected by bushings or fittings?	
		Before an employee or contractor performs any service or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system is to be isolated. Only authorized persons may apply and remove lockouts and tags.	
		Contractors planning to use hazardous energy control procedures submit their hazardous energy control plan to the WESTON site safety officer or designee before implementing lockout/tagout procedures.	
		There is a site specific hazardous energy control plan that clearly and specifically outlines the scope, purpose, authorization, rules and techniques to be used for the control of hazardous energy.	
		Workers possess the knowledge and skills required for the safe application, usage and removal of energy controls.	

WELDING AND CUTTING
29 CFR 1926 Subpart J. EM 385-1-1, Section 10

YES	NO		COMMENT
		Prior to performing welding, cutting or any other heat or spark producing activity, an assessment of the area is made by a competent person to identify combustible materials and potential sources of flammable atmospheres.	
		Welders, cutters and their supervisors are trained in the safe operation of their equipment, safe welding and cutting practices, hot work permit requirements, and fire protection.	
		Welding and cutting equipment is inspected daily before use. Unsafe equipment is taken out of use, replaced or repaired.	
		Workers and the public is shielded from welding rays, flashes, sparks, molten metal and slag.	
		Employees performing welding, cutting or heating are protected by PPE appropriate for the hazards (e.g., respiratory, vision and skin protection).	
		Compatible fire extinguishing equipment is provided in the immediate vicinity of welding or cutting operations.	
		Drums, tanks, or other containers and equipment which have contained hazardous materials shall be thoroughly cleaned before welding or cutting. Cleaning shall be performed in accordance with NFPA 327, Cleaning or Safeguarding Small Tanks and Containers, ANSI/AWS F4.1, Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, and applicable health and safety plan requirements.	

HAND AND POWER TOOL SAFETY
29 CFR 1926 Subpart I. EM 385-1-1, Section 13

YES	NO		COMMENT
		Power tools are from a manufacturer listed by a nationally recognized testing laboratory for the specific application for which they are to be used.	
		Hand & power tools are inspected, maintained, tested and determined to be in safe operating condition before use.	
		Tools found to be unsafe are not used, tagged and repaired or destroyed.	
		Users of tools are trained in safe use.	
		Electrical tools have cords and plug connections in good repair.	
		Electrical tools are effectively grounded or approved double insulated.	
		Reciprocating, rotating, and moving parts of equipment are guarded if they may be accessed by employees or they otherwise create a hazard.	
		Safety clips/retainers are installed and maintained on pneumatic impact tool connections.	
		Chain saws have an automatic chain brake or anti-kickback device.	
		Pneumatic and hydraulic hoses and fittings are inspected regularly.	
		Employees who operate powder actuated tools are trained and carry valid operators cards.	
		Powder activated tools are stored in individual locked containers, when not in use and are not loaded until ready to use.	
		Powder actuated tools are inspected for obstructions or defects daily before use.	
		Powder actuated tool operators have appropriate PPE.	

RIGGING
29 CFR 1926 Subpart H. EM 385-1-1, Section 15

YES	NO		COMMENT
		Rigging equipment is inspected as specified by the manufacturer, by a qualified person, before use on each shift and as necessary to assure that it is safe.	
		Defective equipment is removed from service.	
		Rigging not in use is removed from the work area, properly stored, and maintained in good condition.	
		Wire rope removed from service for defects is cut up or plainly marked as unfit for use as rigging.	
		The number of saddle clips used to form eyes in wire rope conforms with Table H-20, are spaced evenly and the saddles are on the live side.	
		Chain rigging has a tag clearly indicating load limits, is inspected before initial use, then weekly, and is of alloyed metal.	
		Fiber rope rigging is not used if it is frozen or has been subject to acids or excessive heat.	
		Slings and their fittings and fastenings are inspected before use on each shift and as needed during use.	
		Drums, sheaves, and pulleys on rigging hardware are smooth and free of surface defects that can damage rigging.	

MATERIAL HANDLING, STORAGE, AND DISPOSAL
29 CFR 1926 Subpart H. EM 385-1-1, Section 14

YES	NO		COMMENT
		Employees are trained in and use safe lifting techniques.	
		Materials are not moved or suspended over workers unless positive precautions have been taken to protect workers.	
		Conveyors are constructed, inspected, & maintained by qualified persons according to manufacturer's recommendations.	
		All conveyors are to be equipped with emergency stopping devices.	
		Hazardous exposed moving machine parts are guarded mechanically, electrically or by location.	
		Controls are clearly marked and/or labeled to indicate the function controlled.	
		Taglines are used for suspended loads where the movement may be hazardous to persons.	
		Material in storage is protected from falling or collapse by effective stacking, blocking, cribbing, etc.	
		Walkways and aisles are to be kept clear.	
		Materials are not stored on scaffolds or runways in excess of normal placement or in excess of safe load limits.	
		Work areas and means of access are maintained safe and orderly.	
		Tools, materials, extension cords, hoses or debris do not cause tripping or other hazards.	
		Storage and construction sites are kept free from the accumulation of combustible materials.	
		Waste materials and rubbish are placed in containers or, if appropriate, in piles. Waste materials are disposed of in accord with applicable local, state, or federal requirements.	

WORK PLATFORMS/SCAFFOLDS
29 CFR 1926 Subparts L, M, N. EM 385-1-1 Sections 21, 22

YES	NO		COMMENT
		Work platforms are erected, used, inspected, tested, maintained and repaired according to manufacturer's requirements.	
		Construction, inspection, and disassembly of scaffolds is under the direction of a competent person.	
		Workers on scaffolding have been trained by a qualified person.	
		Scaffolds are erected on a firm and level surface and are square and plumb.	
		Scaffolds are not loaded in excess of rated capacity.	
		Working levels of work platforms are fully planked or decked.	
		Planks are in good condition and free from obvious defects.	
		Fabricated frame scaffolding four times higher than the base width is secured to building/structure according to manufacturer's instruction and/or OSHA requirements.	
		Working platforms of scaffolding over ten feet in height have guard rails meeting OSHA specifications. Fall protection is suggested at four feet or greater.	
		Scaffolding/work platforms are accessed by means of a properly secured ladder or equivalent. Built on ladders conform to scaffold ladder requirements. Climbing of braces is not allowed.	
		Crane supported work platforms are designed and used in accordance with OSHA standards.	
		Elevating work platforms are operated, inspected and maintained according to the equipment operations manual.	
		Employees working in aerial lifts remain firmly on the floor of the basket. Employees use fall protection while in an aerial lift basket.	

WALKING AND WORKING SURFACES AND STAIRS
29 CFR 1926 Subparts L, M, X. EM 385-1-1, Sections 21, 22, 24

YES	NO		COMMENT
		Work areas are clean, sanitary, and orderly	
		Work surfaces are kept dry or appropriate means are taken to assure the surfaces are slip-resistant	
		Accumulations of combustible dust are routinely removed.	
		Aisles and passageways are kept clear and marked as appropriate.	
		There is safe clearance for walking in aisles where motorized or mechanical handling equipment is operating.	
		Materials or equipment is stored in such a way that sharp projections will not interfere with the walkway.	
		Changes of direction or elevation are readily identifiable.	
		Aisles or walkways that pass near moving or operating machinery, welding operations or similar operations are arranged so employees will not be subjected to potential hazards.	
		Standard guardrails are provided wherever aisle or walkway surfaces are elevated more than 30 inches above any adjacent floor or the ground and bridges provided where workers must cross over conveyors and similar hazards.	
		There are standard stair rails or handrails on all stairways having four or more risers or with an elevation of 30 or more inches.	
		Stairways are at least 22 inches wide. (General Industry Standard)	
		Stairs angle no more than 50 and no less than 30 degrees, risers are uniform from top to bottom (plus or minus 1/4 inch) and are provided with a surface that renders them slip resistant.	
		Stairway handrails are not less than 36 inches above the leading edge of stair treads and have at least 3 inches of clearance between the handrails and the wall or surface they are mounted on.	
		Where doors or gates open directly on a stairway, there is a platform provided so the swing of the door does not reduce the width of the platform to less than 20 inches.	
		Where stairs or stairways exit directly into any area where vehicles may be operated, there are adequate barriers and warnings provided to prevent employees stepping into the path of traffic.	
		Signs are posted showing the load capacity of elevated storage areas.	
		An appropriate means of access and egress is provided for surfaces with 19 or more inches of elevation change.	
		Material on elevated surfaces is minimized, with that necessary for immediate work requriements piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading.	

LADDERS
29 CFR 1926 Subpart X. EM 385-1-1, Section 21

YES	NO		COMMENT
		Portable ladders are used for their designed purpose only.	
		Portable ladders are examined for defects prior to, and after use.	
		Ladders found to be defective are clearly tagged to indicate "DO NOT USE" if repairable, or destroyed immediately if no repair is possible.	
		Workers are trained in hazards associated with ladder use and how to inspect ladders.	
		Ladders have secure footing provided by a combination of safety feet, top of ladder tie-offs and mud cills or a person holding the ladder to prevent slipping.	
		The handrails of a straight ladder used to get from one level to another extend at least 36 inches above the landing.	
		Ladders conform to construction criteria of ANSI Standards A-14.1 and A-14.2.	
		Wooden ladders are not painted with an opaque covering such that signs of flaws, cracks or drying are obscured.	
		Fixed ladders are constructed and used according to OSHA Standards, 29 CFR 1910.27 and ANSI A-14.3.	
		Rungs, cleats or steps, and side rails that may be used for handholds when climbing, offer adequate gripping surface and are free of splinters, slivers or burrs, and substances that could cause slipping.	
		Fixed ladders of greater than 24 feet have cages or other approved fall protection devices. (note General Industry is 20 feet).	
		Where fall protection is provided by ladder safety systems (body belts or harnesses, lanyards and braking devices with safety lines or rails), systems meet the requirements of and are used in accordance with WESTON Fall Protection Standard Practices and are compatible with construction of the ladder system.	

DEMOLITION
29 CFR 1926 Subpart T. EM 385-1-1, Section 23

YES	NO		COMMENT
		Prior to initiating demolition activities an engineering survey (by a competent person) and a demolition plan (by a competent person) is completed.	
		All employees engaged in demolition activities are instructed in the demolition plan.	
		It has been determined through the engineering survey and outlined in the plan, if any hazardous materials, or conditions (e.g., asbestos, lead, utility connections, etc.) exist. Such hazards are controlled or eliminated before demolition is started.	
		Continued inspections, by a competent person, are conducted to ensure safe employee working conditions.	

TREE MAINTENANCE AND REMOVAL
29 CFR 1910 Subpart R. EM 385-1-1, Section 31

YES	NO		COMMENT
		Tree maintenance or removal is done is under the direction of a qualified person.	
		Tree work, in the vicinity of charged electric lines, is by trained persons qualified to work with electricity and tree work. Appropriate distances are maintained for all workers who are not qualified.	
		Equipment is inspected, maintained, repaired and used in accordance with the manufacture's directions.	
		Prior to felling actions are planned to include clearing of the area to permit safe working conditions and escape.	
		Employees must be trained in the safe operation of all equipment.	
		All equipment and machinery is inspected and determined safe prior to use.	
		Work is performed under requirements of FLD 43.	

BLASTING
29 CFR 1926 Subpart U. EM 385-1-1, Section 29

YES	NO		COMMENT
		A blasting safety plan is developed prior to bringing explosives on-site.	
		The transportation, handling, storage, and use of explosives, blasting agents, and blasting equipment must be directed and supervised by a person with proven experience and ability in blasting operations. Licensing of person is verified.	
		Blasting operations in or adjacent to cofferdams, piers, underwater structures, buildings, structures, or other facilities must be carefully planned with full consideration to potential vibration and damage.	

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE AND UNDERGROUND STORAGE TANK (UST) ACTIVITIES
29 CFR 1926 Subpart D. EM 385-1-1, Section 28

YES	NO		COMMENT
		All construction activities performed with known or potential exposure to hazardous waste are conducted in accordance with Hazardous Waste Operations and Emergency Response requirements.	

ATTACHMENT 4
DEFICIENCY TRACKING FORM

MASTER DISCREPANCY LIST

#	Description	Risk Rating	Date Identified	Status / Date	Reference	Comments	Corrective Action/ Date to be Completed	Responsible Party
1								
2								
3								
4								
5								
6								
7								
8								
9								

Notes:
I – Catastrophic
II – Serious
III – Severe
IV – Moderate
V – Minor
BMP – Best Management Practice

ATTACHMENT 5
USACE FORM 3394
ACCIDENT INVESTIGATION REPORT

(For Safety Staff only)	REPORT NO.	EROC CODE	**UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT** *(For Use of this Form See Help Menu and USACE Suppl to AR 385-40)*	**REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)**

1. **ACCIDENT CLASSIFICATION**

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC ☐ FATAL ☐ OTHER			☐	

2. **PERSONAL DATA**

a. Name *(Last, First, MI)*	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER *(Specify)*

3. **GENERAL INFORMATION**

a. DATE OF ACCIDENT *(month/day/year)*	b. TIME OF ACCIDENT *(Military time)* hrs	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME: (2) SUBCONTRACTOR:

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE ACTIVITY
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER *(Specify)*	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER *(Specify)*	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER *(Specify)*

4. **CONSTRUCTION ACTIVITIES ONLY** *(Fill in line and corresponding code number in box from list - see help menu)*

a. CONSTRUCTION ACTIVITY	(CODE) #	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE) #

5. INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see help menu)*

a. SEVERITY OF ILLNESS/INJURY	(CODE) #	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS RESTRICTED DUTY

e. BODY PART AFFECTED	(CODE) #	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE) #
PRIMARY		TYPE	
SECONDARY		SOURCE	
f. NATURE OF ILLNESS/INJURY			

6. PUBLIC FATALITY *(Fill in line and correspondence code number in box - see help menu)*

a. ACTIVITY AT TIME OF ACCIDENT	(CODE) #	b. PERSONAL FLOATATION DEVICE USED?
		☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER *(Specify)*	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER *(Specify)*	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT *(Fill in line and correspondence code number in box from list - see help menu)*

a. TYPE OF VESSEL/FLOATING PLANT	(CODE) #	b. TYPE OF COLLISION/MISHAP	(CODE) #

10. ACCIDENT DESCRIPTION *(Use additional paper, if necessary)*

11. **CAUSAL FACTOR(S)** *(Read Instruction Before Completing)*

a. (Explain YES answers in item 13)	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. *(CONTINUED)*	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. **TRAINING**

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAINING.
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	(Month) (Day) (Year)

13. **FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES** *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a. DIRECT CAUSE

b. INDIRECT CAUSE(S)

14. **ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).**

DESCRIBE FULLY:

15. **DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.**

a. BEGINNING (Month/Day/Year)	b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT CORPS _____ CONTRACTOR _____	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*	f. OFFICE SYMBOL

16. **MANAGEMENT REVIEW** *(1st)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. **MANAGEMENT REVIEW** *(2nd - Chief Operations, Construction, Engineering, etc.)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. **SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW**

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE

19. **COMMAND APPROVAL**

COMMENTS

COMMANDER SIGNATURE	DATE

*U.S. GOVERNMENT PRINTING OFFICE: 1993-0-791-757

10. ACCIDENT DESCRIPTION ***(Continuation)***

13a. DIRECT CAUSE ***(Continuation)***

13b. INDIRECT CAUSES *(Continuation)*

14. ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S) *(Continuation)*

ATTACHMENT 6
HAZARD ASSESSMENT FORM

ATTACHMENT 6

HAZARD ASSESSMENT CERTIFICATION FORM

Date: **Location:**

Assessment Conducted By:

Specific Tasks Performed at this Location:

I. Overhead Hazards Identified (Check all that apply):

☐ Suspended loads that could fall
☐ Overhead beams or loads that could be hit against
☐ Energized wires or equipment that could be near enough to arc or hit against
☐ Employees work at elevated site who could drop objects on others below
☐ Sharp objects or corners at head level
☐ Other (Describe/List) _____

Head Protection

Hard Hat: ☐ Yes ☐ No

II. Eye and Face Hazards Identified (Check all that apply):

☐ Chemical splashes
☐ Dust
☐ Smoke and fumes
☐ Welding operations
☐ Lasers/optical radiation
☐ Projectiles
☐ Other (Describe/List) _____

Eye Protection

Safety glasses: ☐ Yes ☐ No
Goggles: ☐ Yes ☐ No
Face Shield: ☐ Yes ☐ No
Tinted Lens: ☐ Yes ☐ No
(If yes, Degree of Filtering: _____)

III. Hand Hazards Identified (Check all that apply):

☐ Chemicals
☐ Sharp edges, splinters, etc.
☐ Temperature extremes
☐ Biological agents
☐ Exposed electrical wires
☐ Sharp tools, machine parts, etc.
☐ Other (Describe/List) _____

Hand Protection

Gloves: ☐ Yes ☐ No
☐ Chemical resistant
☐ Temperature resistant
☐ Abrasion resistant
☐ Electrical protective
☐ Other (Describe/List)

IV. Foot Hazards Identified (Check all that apply):

☐ **Heavy materials handled by employees**
☐ **Sharp edges or points (puncture risk)**
☐ **Exposed electrical wires**
☐ **Unusually slippery conditions**
☐ **Wet conditions**
☐ **Construction/demolition**
☐ **Other (Describe/List) _____**

Foot Protection

Safety Shoes: ☐ Yes ☐ No
Types: ☐ Toe protection
☐ **Metatarsal protection**
☐ **Puncture resistant**
☐ **Electrical insulation**
☐ **Non-static**
Other (Describe/List)

V. Hazards to Body Identified (Check all that apply):

☐ **Chemical contact**
☐ **Fire or flash**
☐ **Temperature extremes**
☐ **UXO**
☐ **Radiation (Ionizing)**
☐ **Radiation (Non-Ionizing)**
☐ **Other (Describe/List) _____**

Body Protection

☐ **Chemical-resistant coveralls**
☐ **Thermal protection**
☐ **Welding —Leathers‖**
☐ **Ballistic shields for UXO operations**
☐ **Flash protection (e.g., Nomex or equivalent)**
☐ **Ballistic or cut-resistant chaps**

VI. Noise Hazards Identified: Noise Source(s):

Noise Protection (List):

VII. Other Identified Safety and/or Health Hazards (list):

Recommended Protection (List):

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards present on (date)_____ .

_____

Signature

ATTACHMENT 7
CERTIFICATIONS FOR SITE PERSONNEL

Certifications of UXO Techs will be maintained on site in the field office

Former Camp Bonneville Site Personnel

Certifications are kept on file on site and available for inspection at any time.

George Overby	Project Manager
Tony Clark	MEC Task Manager
Bruce Moe	SUXOS
Michael Everman	UXOSO
Randy Schneider	UXOQCS
Drew Caldwell	UXO TECH 3
Pete Grubb	UXO TECH 3
Rex Andreasen	UXO TECH 2 ½
Glenn Haupt	UXO TECH 2 ½
Nicholas Clark	UXO TECH 2
Ian Wiekamp	UXO TECH 2
Greg Cook	UXO TECH 2
Butch Mendez	UXO TECH 2
James Koch[3]	UXO TECH 2
Karl Christiansen	UXO TECH 2
Wes Bain	UXO TECH 2
Kristen Mendez	UXO TECH 2
Kacy Cameron	UXO TECH 2
Jennifer Chester	UXO TECH 1
Reida Johnson	UXO TECH 1
Tiffany Dana	UXO TECH 1
Cecilia Flores	UXO TECH 1

ATTACHMENT 8
EMS/RESCUE CONFIRMATION AND EVALUATIONS

EVALUATION OF EMS PROVIDERS Date: 05/21/12

Name of Responding Group or Agency: American Medical Response

Contacted: American Medical Response

Confirmation of Authority to commit to supporting Weston: Camp Bonneville is contracted to Vancouver 911 for fire and ambulance service.

Contact information:

Emergency Phone Number: 911
American Medical Response
Non-Emergency Telephone Number: (360) 750-4679

Distance in miles and time from EMS provider to Camp Bonneville Military Reserve, 23201 NE Pluss Road, Vancouver WA 98682: Miles: varies depending on call volume Time: Generally less than 9 minutes .

Note: Time to be able to institute rescue operation must be determined and documented based on known or perceived hazards. In the event of hazardous atmospheres typical response times should be 5 minutes or less.

Hours of availability: AM to PM or 24 Hours X

Staffing: Volunteer Full-time X

Confirmation of services and other specialized rescues that may be associated with field work such as:

Type of service: Basic Life Support X Advanced Life Support X

High Angle Rescue (Rescue at elevation): Yes ; NO X ;

Excavation Rescue: Yes ; NO X ;

Fall Arrest System Rescue: Yes ; NO X ;

Confined Space Rescue: Yes ; NO X ;

Ability to respond to more than one emergency at a time: Yes X ; NO

If "NO", provisions must be made for other rescue options or entry operations must cease until responders are available again.

If "NO" what mechanism(s) will be in place to verify when responders are both unavailable and when they are available to respond again (e.g., phone call, radio to responder channel, etc.).

EVALUATION OF FIRE/RESCUE PROVIDERS Date: 05/21/12

Name of Responding Group or Agency: Clark County Fire District Number 3

Name of Individual(s) Contacted: N/A

Confirmation of Authority to commit to supporting Weston:

Contact information:

Emergency Phone Number: 911
Non-Emergency Telephone Number: (360) 687-6968
Address: 18209 NE 259th St.
Vancouver, WA 98604

Distance in miles and time from EMS provider to site(s): Miles: 5.1 Time: 15

Note: Time to be able to institute rescue operation must be determined and documented based on known or perceived hazards. In the event of hazardous atmospheres typical response times should be 5 minutes or less.

Hours of availability: _____AM to _____PM or 24 Hours X

Staffing: Volunteer _____ Full-time X

Confirmation of services and other specialized rescues that may be associated with field work such as:

Type of service: Basic Life Support X Advanced Life Support X

High Angle Rescue (Rescue at elevation): Yes ____; NO X;

Excavation Rescue: Yes ____; NO X;

Fall Arrest System Rescue: Yes ____; NO X;

Confined Space Rescue: Yes _____; NO X;

Ability to respond to more than one emergency at a time: Yes X; NO _____

If "NO", provisions must be made for other rescue options or entry operations must cease until responders are available again.

If "NO" what mechanism(s) will be in place to verify when responders are both unavailable and when they are available to respond again (e.g., phone call, radio to responder channel, etc.).

MEDICAL FACILITY

Date: 05/21/12

Name of Responding Group or Agency: Southwest Washington Medical Center

Name of Individual(s) Contacted: N/A

Confirmation of Authority to commit to supporting Weston:

Contact information:

Emergency Phone Number: 911
Non-Emergency Telephone Number: (360) 256-2000
Address: 400 NE Mother Joseph Pl
Vancouver, WA 98664

Distance in miles and time to Medical Facility from site(s): Miles: 12.3 Time: 27

Hours of availability: _____AM to _____PM or 24 Hours X

Does the Facility have capabilities to deal with:

Chemical Exposure Yes X No _____
Trauma: Yes X No _____ If yes, Level: 2
If no, nearest Trauma Center: _____

APPENDIX E
GEOPHYSICAL INVESTIGATION PLAN

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ABBREVIATIONS AND ACRONYMS

ATV	all-terrain vehicle
bgs	below ground surface
CAP	Cleanup Action Plan
CAR	Corrective Action Report
CBMR	Camp Bonneville Military Reservation
CFR	Code of Federal Regulations
CVFAW	Central Valley Floor and Associated Wetlands
DGM	Digital Geophysical Mapping
DID	Data Item Description
EZ	Exclusion Zone
GPS	global positioning system
ID	identification
ISO	industry standard objects
IVS	instrument verification strip
LUU	illuminating unit
m	meter
mm	millimeter
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
mV	mill volt
NAD	North American Datum
PDA	personal digital assistant
QA	quality assurance
QC	quality control
RAU	Remedial Action Unit
RTK	Real-Time Kinematics
SOP	Standard Operating Procedure
SUXOS	Senior Unexploded Ordnance Supervisor
U.S.	United States
USACE	United States Army Corps of Engineers
UTM	Universal Transverse Mercator

ABBREVIATIONS AND ACRONYMS (Continued)

UXO	Unexploded Ordnance
UXOSO	UXO Safety Officer
UXOQCS	UXO Quality Control Specialist
WESTON	Weston Solutions, Inc.

1. GEOPHYSICAL INVESTIGATION PLAN

1.1 SCOPE OF GEOPHYSICAL INVESTIGATION

The objective of the Removal Action (RA) is 100% clearance of surface and subsurface MEC/MPPEH/MD to a depth of 14 inches bgs by physical removal or detonation in the Central Valley Floor and Associated Wetlands (CVFAW) and Step-outs. Application of geophysical methods will vary dependent on terrain. Digital geophysical mapping (DGM) will generally be conducted in open accessible areas. Analog investigations will be conducted in areas where terrain is not amenable to DGM data collection.

The overall geophysical investigation approach at the CVFAW and Step-outs include the following phases of work:

- Develop project data quality objectives (DQOs) through consultation with stakeholders including the Washington Department of Ecology (WDOE) and Clark County.
- Perform surveying and vegetation removal with UXO support.
- Implement the Geophysical System Verification and conduct geophysical surveys using both analog and digital instruments to detect potential MEC.
- Intrusively investigate and remove all sources of anomalies to a depth of 14-inches below ground surface (bgs).
- Map anomalies detected below 14 inches bgs.
- Conduct surface clearance step-out grids.
- Include the results of the geophysical investigations in an After Action Report.

1.1.1 Removal Action Goals

The goal of the removal action (RA) at the CVFAW is to conduct digital geophysical mapping (DGM) and analog magnetometer surveys to remove possible MEC, MD, MPPEH, and other metallic items great than 2 inches square located on the ground surface and to a depth of 14 inches bgs.

1.1.2 Data Quality Objectives

To achieve these goals, data quality objectives were developed using the U.S. Environmental Protection Agency (EPA) QA/G-4HW guidance (EPA, 2006). The DQOs are qualitative and quantitative statements that define the type, quantity, and quality of data necessary to support the decision-making process during the removal action. The DQOs are developed using a seven-step process that includes the following:

1. **State the problem:** Provide a concise description of the problem.
2. **Identify the decisions**: Develop decision statements to solve the problem.
3. **Identify inputs to the decision:** Identify information and measurements needed to make the decisions.
4. **Define study boundaries:** Identify conditions such as spatial and temporal boundaries.
5. **Develop a decision rule:** Qualify the decisions to understand data needs.
6. **Specify tolerable limits on decision errors:** Develop performance criteria.
7. **Optimize the design:** Design an effective data collection strategy based on the previous steps.

Development of the DQOs for the CVFAW is presented in the following section.

Central Valley Floor and Associated Wetlands (CVFAW)

1. **State the problem:** This is a 432-acre area that was extensively used for target and training operations. Several target and/or waste disposal areas identified from previous Interim Actions and include:
   - Stokes Mortar Target Area
   - MEC Disposal Area (Burial Pit)
   - 37 millimeter (mm) Artillery/Stokes Mortar Target Area
   - Rifle Grenade Target Area
   - 2.36-inch Rocket Target Area near the Former Sewage Lagoons

MEC and MD items have been documented and removed during previous investigations and included 2.36-inch rockets, 3-inch Stokes mortars, rifle grenades, smoke grenades, practice hand grenades, M73 practice 35mm rockets, and M49 trip flares.

Approximately 120 acres of the CVFAW consists of wetlands where there is a moderate to high probably that MEC and MD are present based on previous reports that surface clearance may not have been conducted within the wetlands.

Based on the Clark County Reuse Plan, the CVFAW contains most of the proposed Regional Park improvements and will be the primary activity area within the park, making it accessible to recreational visitors.

2. **Identify the decisions:** The primary decisions for the CVFAW include:
   - Use Digital Geophysical Mapping or analog anomaly detection
   - If DGM use RTK-GPS or Line and Fiducial Positioning
   - If DGM set the anomaly selection methodology
   - Decide to pursue step-out methodology
3. **Identify the inputs to the decision:**
   - Terrain, tree density and size, wetlands morphology
   - Tree cover
   - Type and size of expected and proven MEC
   - MEC and MD identification in a boundary grid
4. **Define study boundaries:** Decision rules are identified specific to the geophysical clearances.
   - Each 100- by 100-foot grid will be evaluated to determine the most appropriate anomaly location method.
     - If the terrain is such that it is unfeasible or unsafe to conduct DGM then analog methods will be used.
     - If the density of tree trunks is such that it will severely disrupt the execution of a DGM survey (approximately 2 to 3 trunks in a 100 foot line), then analog methods will be used.
   - Each 100- by 100-foot sub grid selected for DGM will be evaluated based on the type and extent of tree canopy. If GPS lock cannot be maintained then an alternate positioning system will be used such as line and fiducial or laser (robotic total station).
   - Each 100- by 100-foot sub grid will be evaluated for MEC potential. Based on empirical historical data and data from the instrument aided near surface clearance and consultations with the Clark County representatives, a methodology will be proposed to accurately locate a specific size of MEC at a specific depth. The Geophysical System Verification/ Instrument Verification System process will be used to verify system ability to meet the proposed detection standard

- Step-out clearance will be used when MEC/MD is found within a boundary grid of a designated clearance by adding a new sub grid adjacent to the grid of concern and investigated. The step-out procedures will stop or be modified if the grid extends beyond the property perimeter fence line; if the new grid extends to an adjacent clean-up area requiring clearance or if in a previously cleared area; or if worker safety is compromised.

5. **Specify tolerable limits on decision errors:**
   - The proper detection instrumentation will be used to detect potential MEC/MPPEH/MD items.
   - Intrusive investigations will identify the anomalies.
   - Measurement Quality Objectives (MQO) for the DGM surveys will be achieved to ensure equipment is functioning to specification and the surveys are achieving survey design requirements.
6. **Optimize the design:** The technical design of the CVFAW project is a continuous and iterative process. A successful design requires constant monitoring, innovation to adapt to site conditions and robust performance verification. The design is flexible to adapt to site conditions yet rigid enough in performance criteria to ensure absolute compliance with established clean-up criteria.

1.1.3 Data Incorporation into the After Action Report

All information generated during the MEC clearance will be entered into the project GIS database. The database will be continually updated and managed as new data become available over the course of the project. Ultimately, the data will be incorporated into the After Action Report.

2. GEOPHYSICAL SYSTEM VERIFICATION

The geophysical system verification (GSV) approach will be used to monitor and verify DGM sensor functionality and establish survey metrics during the Removal Action (RA) geophysical mapping activities at the Central Valley Floor and Associated Wetlands (CVFAW) and Step-outs. The GSV approach uses an instrument verification strip (IVS) and is a USACE-accepted alternative to the traditional Geophysical Prove-Out (GPO). The GSV approach capitalizes on the known performance of the geophysical sensors (Naval Research Laboratory [NRL], 2009). It provides the advantage of reallocating resources traditionally devoted to a GPO to support a simplified, yet more rigorous, verification method for geophysical system operations. In addition, it incorporates a seeding program to continually monitor production mapping work within the CVFAW. The GSV is designed to:

- Select an IVS location that represents, as closely as possible, actual site conditions (e.g., terrain, vegetation, background noise, geology, infrastructure, etc.);
- Seed the IVS with expected inert MEC and their approved Industry Standard Objects (ISO) QC surrogates;
- Capture and document various analog and digital geophysical instrument operations, and associated navigation systems, under actual site conditions, by acquiring background and response data over the IVS;
- Establish each sensor and positioning system's capabilities and limitations in detecting the seeded MEC and QC simulants;
- Demonstrate data transfer, processing, analysis and reacquisition;
- And establish site-specific performance metrics or DQOs for background noise, sample density, MEC detection, positioning accuracy, reacquisition, anomaly selection, and data management.

2.1.1 Instrument Verification Strip

The IVS provides a means to verify that the geophysical detection system is operating properly. The seed items placed within the IVS should be observed in the geophysical data with signals

consistent with the physics-based instrument response curves developed for the EM61-MK II. The analog mag and dig survey instrumentation will also be tested at the IVS each day.

For the EM61-MK II, ambient site noise will be measured and evaluated against the instrument response curves to determine the detection depths for the items of interest anticipated at CVFAW. In addition, this methodology provides on ongoing monitoring of system performance, as well as an additional QC of production work by using a blind seeding program.

Instrument Verification Strip Design

The seeds will be placed in the IVS to effectively distribute all items sufficiently to prevent overlapping signals. The ISOs will be buried horizontally (least favorable orientation) with the long axis aligned parallel to the ground surface, and at a depth near the noise and least favorable orientation response curve intersection. The inert 20mm projectiles will be buried at 7 inches below ground surface (bgs). The 20 mm projectiles will be tagged as “inert test target”. The IVS will also contain two 6-inch survey nails used to check the daily latency of the system. An additional four 6-inch survey nails will be installed at the corners of the IVS. The items will be placed at the discretion of the Site Geophysicist based on site conditions. Item types will be confirmed with Anomaly Selection Board (ASB) prior to mobilization. Seed locations and the IVS corners will be surveyed to a horizontal accuracy of 3 centimeters and a vertical accuracy of 5 centimeters by using a Trimble Real-Time Kinematic (RTK) Global Positioning System by a qualified RTK-operator or a Professional Land Surveyor (PLS). Item parameters (i.e., surveyed location, size, depth, orientation) will be recorded and entered into the database. Each seed item will be documented with a digital photograph.

The IVS(s) will be maintained for the project duration for geophysical QC purposes and to qualify any new or replacement equipment or personnel. The seeded IVS targets will be removed at the completion of the project and the plot restored to its original condition.

The exact IVS design is not finalized as it is a process of consultation and site specific MEC conditions. Figure 1 is a sample design based on a 20 mm detection standard.

The test strip is designed so the sled runners drop into shallow excavated trenches along the length of the IVS. This ensures passes are consistent from one run to the next in terms of coils passing

directly over each item. This ensures we have data to day repeatability on successive passes which fulfills the repeatability DQO.

Instrument Verification Strip Procedures

Prior to the burial of any seed items, the IVS area will be cleared of metallic surface debris. If MEC or MEC items are discovered during the surface clearance, the IVS will be relocated. A background survey will be conducted within the proposed IVS area to determine the suitability of the site and to assist the site geophysicist in placement of the seed items. Following the background survey, the seed items will be buried in accordance with the proposed IVS layout each at a depth between ground surface and the anticipated detection depth (to be determined based on background noise). At each seed location, the area will be screened by qualified UXO Technicians using anomaly avoidance techniques to ensure the placement locations for the seed items and corner markers are clear of metallic anomalies. The location and depths of the seed items will be surveyed and recorded. Each seed item, as well as the start and end points of the IVS, will be marked with PVC pin flags or wooden stakes.

A DGM survey will be performed over the IVS using the EM61-MK II towed array. The data collected will then be evaluated to determine a seed item response baseline to compare against production surveys. WESTON will perform a DGM survey with the EM61-MK II single sensor man-portable cart over the IVS as well. The cart is modified to drop the coils to a height similar to the coil height used for the towed array so a single picking methodology may be used.

The IVS will also be used to demonstrate the UXO Teams ability to use analog geophysical locators to support UXO escort and anomaly avoidance operations. UXO Technicians will perform analog surveys to detect and flag IVS seed items, using standard sweep lanes. The IVS will also be used to determine the best performing analog sensor and settings for use during search, UXO escort, and anomaly avoidance activities.

2.1.2 Blind Seeding

The production grids will be seeded with small ISOs as indicated in Table 1, buried at depths consistent with the IVS to validate detection results within the production area. The locations of the blind seed items will be recorded by the UXO Quality Control Officer/staff using the RTK

GPS, and kept confidential from the DGM and UXO teams. Known seeds consisting of the 6-inch metallic spikes will be placed on grid corners to check the daily latency of the towed array system during the DGM field survey effort. The objective of the seed program will be to provide ongoing monitoring of the quality of the geophysical data collection and the target selection process related to the production survey at CVFAW. At least one ISO seed per acre will be emplaced.

After each data set is collected, the Site Geophysicist will overlay the locations of the blind seeds on the processed data and verify that the detection and navigation DQOs are met in the data set. The response of each ISO will be compared in relation to the IVS results and the instrument response curves.

2.1.3 GSV Procedures

The IVS will be visited daily before and after DGM surveys. Analog mag and dig instrumentation will be tested each day at the IVS before performing surveys. The data will be processed similarly to the production mapping data.

2.1.4 GSV Results

WESTON's Project Geophysicist will work with the Clark County to validate and finalize the initial DGM project metrics based on the IVS results and identify the planned anomaly selection process based on a combination of anomaly peak amplitude, anomaly size and morphology and exclusion of any known site feature or noise selections where abnormal sensor response results in an initial anomaly selection, but the normal decay response is not maintained (e.g., noise from power lines and geology). The peak responses from the IVS seed items will be plotted against their respective instrument response curves. The blind seed items will also be monitored for positional accuracy and response and compared to the IVS results. All seed item responses should plot higher than the calculated response curve for the least favorable orientation response curve. The average noise values across the unseeded portions of the test strip and the geophysical grids will be calculated and monitored during the life of the project. The seed items detected during the mag and dig surveys will be cataloged and tracked via RespondFast—UXO

Investigation in the project GIS database. The GSV results will be included for the digital geophysical data packages. The IVS results will include the following:

- As-built drawing of the IVS including depth and orientation of seeded items
- Representative photographs of the surrogate ISO seed items (initial results)
- Color plots of the DGM data
- Instrument response curves
- Seed target list showing comprehensive results

The analog results will be reviewed and the best performing analog sensor configuration will be selected for production use.

2.2 LOCATION SURVEYING AND MAPPING

A location survey will be conducted by a Washington Professional Licensed Surveyor, and will use the existing 500-ft x 500-ft grid system previously established over the CVFAW. Each 500 foot grid will be further divided into 25 100x100 foot sub grids. A Trimble Pro-XRT Global Positioning System (GPS) or an instrument with equivalent accuracy will be used to perform the location survey. In areas where the topography or tree canopy prevents the use of GPS, traditional line-of-site survey methods will be used. Each 100 foot corner will be staked in the field.

A UXO Technician II or higher will escort archeological and survey personnel to provide anomaly avoidance support as needed for intrusive work throughout the project. Pertinent information related to items recovered during the MEC clearance will be entered into the GIS database and included in the After Action Report.

The surveyor will establish control monuments or survey markers with a minimum of third order accuracy. Horizontal control Class I, third order will be established for all new primary control monuments. Horizontal control is referenced to the Universal Transverse Mercator (UTM), North American Datum (NAD) 83, with units of U.S. Survey feet. Staking of all control points, and points of interest will be accomplished by driving wooden stakes for temporary markers. Six-inch steel spikes will also be used to mark 100-ft x 100-ft sub grids and temporary survey points for relocation purposes. The surveyed geographic position and UTM coordinates will be

accurate to +/-1 ft and will be referenced to the primary control monuments established for the project. Vertical control or topography will not be surveyed.

If large, prominent cultural features are observed in a grid during surveyor activities, the location of the object will be recorded. Other cultural features that are observed during MEC clearance operations will be logged by the UXO Team and presented on the grid contour maps for evaluation during target selection processes.

2.3 GEOPHYSICAL EQUIPMENT

The Subsurface Instruments ML-3 Magnetic Locator and the Minelabs F3 UXO all-metals detector will be used for analog surveys. The Geonics EM61-MK II all-metals detector in a variety of configurations will be used for DGM surveys. Standard operating procedures for the geophysical instrumentation are provided in Appendix G.

2.3.1 Geonics EM61-MK II

The Geonics EM61-MK II is a high-resolution time domain electromagnetic induction sensor capable of detecting both ferrous and non-ferrous metallic objects. The EM61-MK II sensor is battery-powered and operates at a maximum output of 10,000milliVolts (mV). The EM61-MK II sensor is a 1 x 0.5 meter (m) air-cored coil that acts as both a transmitter and receiver. The transmitter generates a pulsed magnetic field that induces eddy currents in conductive objects within the subsurface. These currents are proportional to the conductive nature of the material below the instrument. When conductive objects are present below the instrument, the amplitude and decay time of the induced eddy currents vary in response to the size, mass, and orientation of the objects. The receiver measures the amplitude of these eddy currents at 216, 366, 600, and 1260 micro-second intervals or time gates during the decay period. Only the bottom coil will be utilized and all four time gates will be recorded at a frequency of 10 Hertz (Hz) rate. Descriptions of the EM61-MK II configurations are provided in Table 2. The instruments used for the configurations listed in Table 2 are depicted in the following photographs: Photograph 1 shows the four coil EM61 MK II Towed-Array. Photograph 2 shows the single coil EM61 MK II Modified Cart. Photograph 3 shows the EM61 MK II Hand Held unit. Photograph 4 shows the single coil EM61 MK II Modified Cart with the Electronic Hip Chain.

2.3.2 Subsurface Instruments ML-3

The Subsurface Instruments® ML-3 Magnetic Locator will be the primary analog sensor used by UXO Technicians. The handheld unit detects changes in the Earth's ambient magnetic field caused by ferrous metal. The system contains two flux-gate sensors mounted approximately 20 inches apart and aligned in gradiometer configuration to eliminate a response to the Earth's ambient field. The magnetic locators generate an audible response when either of the two sensors detects a disturbance of the Earth's ambient field associated with a ferrous target and/or the presence of a permanent field associated with a ferrous target. The instrument sensitivity can be adjusted to increase or decrease the capability to detect small, metallic materials. The instrument's sensitivity will be adjusted as needed to achieve the IVS requirements.

2.3.3 Minelabs F3 UXO All-Metals Detector

The Minelabs F3 UXO® all-metals detector consists of a handheld, two-coil design that utilizes the electromagnetic method to detect ferrous and non-ferrous metals. An audible signal sounds when the sensors are swept over conductive material. The volume and frequency of the signal changes as the sensor pinpoints the center of the source body. The instrument sensitivity can be adjusted to increase or decrease the capability to detect small, metallic materials. The instrument's sensitivity will be adjusted as needed to achieve the IVS requirements.

2.4 NAVIGATION AND POSITIONING EQUIPMENT

The following sections provide details of the navigation and positioning systems to be used by the project team during the RA at the CVFAW.

2.4.1 Trimble Real Time Kinematic Global Positioning System

A Trimble 5800 RTK-DGPS will be used to position geophysical data and for reacquisition of targets in all open areas with usable access to the DGPS satellite network. The RTK consists of a mobile or roving DGPS antenna/receiver located above the sensor and a base station antenna/receiver. Real time corrections from the base station are broadcast to the roving unit via a radio link using a TRIMMARK 3 base station radio and the 5800's internal radio. This system

provides positional updates at a rate of 1 Hz, with an accuracy capability of 3 cm horizontal and 5 cm vertical, with five or more satellites in use.

The RTK will be checked each morning at a known point (reoccupation test) with day-today location offsets within 6-inches (15cm) of the known location (e.g., and IVS corner).

2.4.2 Local Navigation Methodology (Line and Fiducial)

For line and fiducial DGM surveying under tree canopy cover, (using Cartesian X, Y grid system), geo-referencing the geophysical data will be accomplished using information recorded on a personal digital assistant (PDA) or in a logbook (e.g., start and end line stations, lane spacing, and fiducial mark intervals) and information digitally recorded in each geophysical survey data file. Weston also employs an electronic hip chain system whereby a real-time GIS on the cart (Photograph 1) is combined with an electronic hip chain that measures distance along a line such that geophysical data is combined real-time with real world coordinates as if the system were receiving coordinates form a GPS unit. Figure 2 shows output of real-time GIS on EM61 MK II cart. Photograph 4 shows the electronic hip chain (red box) on the EM61 MK II cart.

The procedure for collecting geophysical data using the line and fiducial method will include the following:

- The geodetic coordinates of the grid system will be used to geo-reference the geophysical data after data collection.
- Surveyor's tape (or graduated static ropes) will be laid out in east-west or north-south direction as the terrain allows. Typically the southwestern corner of the grid surveyed is assigned a relative coordinate of 0E, 0N.
- Range markers (traffic cones or flags) are then placed along the line to be surveyed and provide the geophysical operator with a navigation aid allowing him or her to traverse the line in a linear manner.
- Perform the survey using the electronic hip-chain.

The geodetic coordinates of the grid corners will be used to transform or "warp" the Cartesian coordinates and associated geophysical data to UTM coordinates in the post-processing step.

2.5 ANALOG SURVEYS

Analog surveys will be performed by UXO Technicians in areas inaccessible to DGM instruments. The UXO Teams will divide the grid into search lanes that are suitable for the equipment and terrain. The search lanes will be optimized based on site conditions and lanes will be delineated with line, flags, marking paint and/or marking tape. The teams will traverse across the grids using the analog locators listed above to detect subsurface anomalies. Anomalies will be investigated as they are detected for potential MEC. Details of anomaly counts and MEC and MD information obtained will be logged into RespondFast-UXO Investigation and added to the project GIS.

2.6 DIGITAL GEOPHYSICAL MAPPING SURVEYS

DGM surveys will be used in areas where quality measurement criteria can be achieved and will be performed based on the DQOs presented in **Section 1.1.2 Data Quality Objectives**.

2.6.1 Instrument Standardization

To verify instrument accuracy, the EM61-MK II will be checked at the beginning and end of each workday following the QC criteria (i.e., equipment warm-up, sensor nulling, static, static spike, and cable shake). Additional function checks may be performed throughout the day, as the operator deems necessary. The data from each system test will be compared with data collected on previous days. If there is a significant change in results, the instrument will be rechecked. If the difference in the data cannot be accounted for, the instrument will be taken out of service until repaired.

To facilitate the detection of buried munitions, USACE has defined standard equipment tests and data quality criteria. Table 3 identifies the DGM QC Test Frequency and Acceptance Criteria for the EM61-MK II.

Instrument Function Checks

Prior to conducting QC function tests, spot measurements will be taken at various locations around the proposed DGM survey area to identify the most suitable area to establish a QC station. Static background, static response/spike, and vibration/cable connection tests will be

performed daily before and after surveying at the fixed QC station identified from the spot measurements. QC test statistics will be entered and saved to a database, which will be electronically submitted with each data package.

The purpose of the static test is to determine the ability of the EM61-MK II to collect stable readings consistently throughout the survey. Instrument functionality and ambient electromagnetic (EM) cultural noise are likely sources of non-repeatable readings.

The static spike test demonstrates the sensor's sensitivity to a chosen test object. A conductive spike item of appropriate size will be used for the EM tests to quantify the instrument response and to document its ability to collect stable readings.

The cable connection test is used to identify mechanical and electrical problems with EM61-MK II instrumentation. Large anomalous spikes within the test data indicate poor connectivity between cables and the field data logger.

The personnel test is performed as part of the static test to ensure operators are sufficiently metal-free when using the man-portable unit.

All QC test data will be reviewed real-time prior to and subsequent to data collection and then placed in a database. Each piece of equipment will be monitored over the life of the project for deviations. This ensures that the geophysical equipment is functioning properly. The data will be reviewed by the Site Geophysicist and approved by the Project Geophysicist. If the data reveal a problem with a piece of equipment or a field operation, the data will be reevaluated and, if necessary, the problem will be corrected or the equipment will be replaced.

2.6.2 DGM Measurement Quality Objectives

The geophysical performance criteria provided in Table 4 are based on EM1110-1-4009 (USACE, 2007) and the most recent version of the RI/FS Performance Requirements for Geophysical Instrumentation (USACE, 2009c). The geophysical quality measurement criteria establish the specific metrics concerning sensor performance, navigation accuracy, data density, data processing standard, and anomaly selection criteria to meet the minimum goals for the investigation. WESTON's Project Geophysicist and Geophysical Manager will work with the

Clark County's Geophysicist Representative to validate and finalize the DGM project metrics based on the GSV results while satisfying DQO requirements in the PWS. Metrics will be confirmed or appropriately adjusted based on results of the GSV.

False Positives

False positives result when an anomaly is detected at a given location, declared as a significant anomaly to be intrusively investigated, or otherwise posted to a dig sheet, and no basis for the anomaly is identified in the field. False positives can be a result of low threshold selection of anomalies (i.e., conservative anomaly picking), spikes in the data not successfully removed during processing, instrument jolts resulting from terrain, and heterogeneities in the subsurface. False positives are unavoidable and do not affect the data quality in terms of removing MEC items from the subsurface. The performance goal with respect to false positives is to minimize their occurrences while maintaining the same MEC identification rates.

For the DGM surveys at CVFAW, a false positive goal of no more than 15% is established for this project, in accordance with USACE DID MMRP-09-004 (USACE, 2009d). False positives will be minimized to the extent possible through the use of the best available geophysical practices executed by the geophysical field team and data analyst. False positives will be documented in the database so that the 15% false positive metric can be monitored.

False positive rates will be calculated and tracked for each transect or grid. Exceeding 15% false positives (calculated as a running average for each transect or grid) will result in a re-evaluation of the detection methods, data, and project QC. QA targets chosen below the selection criteria will not be considered a false positive. A Corrective Action Report (CAR), if appropriate, will be provided to explain the root cause for the excessive false positive rate. Additional corrective actions may be performed as deemed necessary for false positives less than 15%.

2.6.3 Geophysical Mapping Data

Records Management

Data related to DGM surveys will be managed using Geosoft Oasis Montaj software. Descriptive attribute information about the field surveys, targets, and dig lists will be stored and maintained in a centralized, project master database in Microsoft® format. This database will contain the QC

statistics and processing parameters collected, performed, and calculated on the DGM data. Spatial data will be managed using GIS, and will be stored in Environmental Systems Research Institute (ESRI)-compatible GIS file formats, primarily ArcInfo coverages and ArcView shape files.

Data will be stored in site-specific folders that indicate individual field efforts, data type, and file extension. DGM data will be submitted in accordance to MMRP-09-004 (USACE, 2009). Data will be provided electronically to Clark County and stake holders via the WESTON TeamLink® Website and will be backed up on WESTON's internal network and project workstation.

Data Storage and Preliminary Processing

Digital geophysical data will be downloaded directly from the data-logger to a work station for processing. Sensor manufacture software (NavMaker61MK II,Dat61, Maglog) will be used to review and edit the data as necessary, normalize the data to the fiducial control marks, generate profile lines, and convert the DGM data to (x,y) coordinates for contouring, map generation, and interpretation.

2.6.4 Data Processing

Standard Data Analysis

The geophysical teams will provide the raw digital data, digital records, and field notes to the Site Geophysicist after completion of the day's field activities. The digital data will be submitted in an ASCII-delimited file (XYZ) suitable for input into the *Geosoft*™ analysis software.

Advanced Data Processing, Corrections, Digital Filtering, and Enhancement

Once the initial data processing procedures are complete, Geosoft's UX-Analyze and QC Geophysical Mapping modules will be used to further reduce the data. The following data processes will be performed where appropriate:

- **Instrument Latency:** Instrument latency will be corrected based on the lags or time differences observed in anomaly peak positions, from the latency test. Corrections will be applied using an appropriate correction routine that accounts for instrument latency time

and sensor velocity. Chevron effects should not be visible in the data maps when plotted at the scales used to detect the smallest amplitude signal for a given MEC item.

- **Instrument Drift Correction:** A drift correction process will be applied to the EM61-MK II geophysical data to remove any unwanted signal indicative of instrument drift.

In addition to the standard geophysical data processing procedures, the following statistics will be calculated for each dataset to ensure data collection is meeting MQOs:

- **Background Noise:** Calculate standard deviation in areas free of anomalous responses to identify background noise levels.
- **Average Speed:** Data acquisition rates should be <3 mph or consistent with speeds demonstrated on the IVS that achieve along-track sample-separation metrics.
- **Along-Track Sampling:** Along-track sampling will be evaluated with respect to mean speed. For the EM61-MK II, average along-track sampling will not exceed 0.66 foot between data points. It is anticipated that along-track sampling will average approximately 0.35 foot based on sampling frequency.
- **Across-Track Sampling:** Across-track sampling for the EM61-MK II grid survey will not exceed 2 feet. Minor data gaps may occur if obstructions exist in the DGM grid. Data gaps due to obstructions will be excluded from this metric; however, data gaps will be cumulatively tracked.

Anomaly Selection Criteria

The Project Geophysicist will use the UX-Detect Blakely Test to perform an initial automatic anomaly selection, using parameters determined from the initial IVS results for EM61-MK II data. GX parameters will be refined to produce anomaly selections of all signals above the mean plus 2.5 to 3 times the standard deviation of the background data. Alternative levels may be required for some datasets and will be documented on a case-by-case basis. A review of EM61-MK II decay profiles (for the 4 channels) at all suspect and/or low-amplitude anomalies will be performed to remove from the list anomalies not exhibiting response characteristics typical of buried metallic objects. This step may be performed using a scripted routine that will automatically find the nearest peak and compare the values for all associated channels in order to

compute, identify, and flag negative time constants. Flagged anomalies, not having decay characteristics of buried metallic objects, will be removed. Additionally, anomalies that were not selected by UX-Detect, yet deemed to represent a potential MEC target, are manually selected. A manual review of the remaining anomalies will be conducted to center the anomaly response as needed.

Figure 3 is an EM61 MK II Geophysical Representation of Historical GPO at Camp Bonneville. The left side shows raw data and the right side shows advanced representation.

The threshold developed anomalies will be laid over an advanced representation of the geophysical data. Anomalies that are identified as geological noise will be identified and eliminated from the dig list and any additional discernible anomalies that are below the pick threshold will be added. Figure 4 demonstrates the effectiveness of this advanced process as a 37 mm fuze buried at 7 inches bgs (7 mV) is clearly in the geological noise realm (1-20 mV) and would normally not be picked but is easily selectable in the advanced representation. Figure 5 shows a smaller item buried over a larger deeper item, and Figure 6 shows a likely discrete larger item buried in a fragmentation pit. Figure 7 is a likely burial pit surrounded by discrete targets.

All corrected geophysical data and anomaly locations will be exported to a database. Throughout the geophysical survey, field personnel will use logbooks to record observations such as variances in the background interference/noise when collecting data, and/or note changes in soil characteristics. Such observations will provide valuable insight during the selection of anomalies in areas where significant variations in background interference/noise exist.

Dig Sheet Development

Following the identification of potential target anomalies from the geophysical data evaluation listed above, the anomaly locations will be digitized based on the position of the target in UTM Zone 10T, NAD 83 coordinates in U.S. Survey Feet on a Target Dig Sheet and Target History Database Form or similar (Appendix F). The Site Geophysicists will assign each anomaly a unique target identifier and will enter the corresponding information for the target into the database. The Dig Sheet will also include QC target anomalies. At a minimum, the following information will be included in the database for each target anomaly:

- Unique Target ID including grid ID (A19-01, [grid ID-target number])
- Easting and northing position
- Channel ID
- Response amplitude of the peak response

2.6.5 Anomaly Reacquisition and Marking

Anomaly reacquisition will be performed once the geophysical and location data are processed. The selected targets will be located in the field using an RTK GPS system. In areas where topography or tree canopy prevents the use of GPS, alternative reacquisition methods, such as Total Station or tape measures, will be used. The geophysical target location will be marked with a PVC pin flag. A UXO Technician will refine the location prior to excavation using the peak response detected by the handheld analog detector. Offsets between the reacquired location and the excavated location will be entered into the database. In the event that the handheld analog detector is unable to resolve the DGM anomaly location, the handheld EM61-MK II will be used as an alternative in this situation.

2.6.6 Anomaly Excavation and Reporting

WESTON will maintain records of all MEC/MPPEH recovered on the project. These records will be kept using the RespondFastSM electronic data entry program on a hand-held PDA. Data entered into the PDA will be transferred to a computer and project database each day and subsequently loaded into the project GIS so that all anomaly information is contained in the project GIS.

3. GEOPHYSICAL SYSTEM QUALITY CONTROL

Overall project QC procedures are provided in the Quality Control Plan and the Senior Geophysicist or his designee will 'back check' post dig (intrusive) results against the DGM target database as part of the anomaly resolution. Specific elements affecting the digital and analog geophysical surveys are provided in the following sections.

3.1 SEEDING PROGRAM

As discussed in Section 2, a seeding program will be initiated as part of the GSV process. The seeding program will consist of know and blind seed items. Known seed items will be used by the DGM teams for navigation, detection, and processing evaluations. Blind seeds will be used by project QC and QA personnel to ensure individual related MQOs are being achieved. The known and blind seeds are described below.

3.1.1 Known Seed Items

Instrument functionality will be monitored at the IVS daily throughout the life of the project. In addition, QC seed items consisting of 6-inch nails or spikes inserted vertically into the ground will be used during the production data collection to quantify positional accuracy of each dataset. The geophysicist will quantify positional accuracy by measuring the anomaly target locations versus the actual geo-referenced location of the QC item (nail/spike) on record from the grid survey. Offset distance between the anomaly target selection and the actual seed location will not exceed the reacquisition metric.

3.1.2 Blind Seed Items

The geophysical grids will be seeded with medium ISOs. The seed locations will be surveyed by a RTK-GPS or equivalent by the UXOQCS or designee and will be blind to the DGM data collection team and UXO Teams. The objective of the seed program will be to provide ongoing monitoring of the quality of the geophysical data collection and target selection process related to the production survey. Each grid or digital dataset will include at least one medium ISO seed item, similar to the items used within the IVS. Seeds will also be place where Mag and Dig survey will take place to ensure MQOs are being achieved.

The blind seeds will be detected within the positional metric of the seed survey location. The location of the seed items will be recorded in the QC log based on XY position and grid identification. The seed item location will be revisited by the UXOQCS during re-collection surveys in each seeded grid to ensure the seed item was detected and removed by the UXO Teams.

If any seed item is not picked and/or recovered during investigation, a Corrective Action Report will be initiated. The report must be resolved with a root cause analysis and a proposed solution so as to avoid a repeat of the error. In the event that the seed item did not present as a distinct anomaly that could be separated out through any means available, then it will be noted as such.

3.1.3 Post-Dig Verification Process

Following anomaly resolution, a post-dig verification process will be performed to determine confidence levels for the removal of MEC from CVFAW. An anomaly is resolved when:

1. There is no geophysical signal remaining at the location;
2. A signal remains but is too low or too small to be associated with the MEC item of interest;
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.

The Senior Geophysicist or designee will review the RespondFastSM database to assess that the physical characteristics of the item(s) found are consistent or appropriate relative to the size and amplitude of detected geophysical anomaly. If it is determined that the item was likely not the entire source of the anomaly, the anomaly location will be reinvestigated using the instrument utilized during the initial survey. Anomalies of this type will be tracked separately in the database in the event that future analysis is required. In addition, information derived from the feedback process of comparing the dig results to the predicted results will be continually evaluated to identify improvements that can be incorporated into the anomaly selection process.

4. GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS

At the close of the project, all GIS data shall be submitted in non-proprietary Spatial Data Transfer Standard format, as well as in the proprietary format used for the execution of the project, specifically AutoCAD and/or Environmental Systems Research Institute (ESRI) ArcGIS geodatabases. Final surface clearance geospatial data will be submitted in accordance with DID MMRP-09-004 (USACE, 2009) in electronic format on DVD. Daily or weekly submittals will be performed via the WESTON TeamLink® project website. Pertinent in-progress and field GIS data, design drawings, survey data, relational databases, and other related data will be made available online to Clark County on the project's TeamLink® Website. All formal GIS data submittals will be made on PC-compatible CD or DVD. Each submittal shall be accompanied by a freeware viewer application appropriate for reviewing the proprietary formatted GIS data (e.g., ArcExplorer for ESRI format geodatabases). Instructions will be included with each submittal for loading the data and viewer application. No other additional software shall be required, and no data modification shall be required for viewing the submittal.

4.1 CONTROL POINTS

The surveyor will establish horizontal control Class I, third order monuments or survey markers used to locate grid corners. The WESTON Team will utilize a Trimble RTK instrument or similar GPS to mark the locations of the grid corners. Staking of all control points and points of interest will be accomplished by driving wooden stakes for temporary markers.

4.2 GIS INCORPORATION

MEC 14-inch clearance results will be referenced to the geographic coordinates and the grid where the item was recovered. All results will be logged using WESTON's RespondFastSM – UXO Investigation field data software for seamless integration into a GIS database. RespondFastSM is WESTON's personal digital assistant (PDA)-based data logging software program which allows for the recording of dig information into a central database.

4.3 PLOTTING

The X/Y location and description of all MEC and MEC-related items identified during the course of the clearance will be recorded electronically on a PDA utilizing RespondFastSM. All locations will be compiled, tracked, and plotted in a GIS database. In addition to MEC locations, grid corners and inaccessible areas will be stored in the GIS database. Maps will be generated as applicable. Information overlays on base maps will include, at a minimum, a point referencing the location of the MEC and grid identification (ID). Because of the extensive number of points anticipated, all other data (such as northing, easting, anomaly ID, anomaly description, etc.) will be recorded in RespondFastSM. The collected data will be imported into a geodatabase utilizing ArcGIS. Metadata will be created for all GIS layers managed by WESTON on this project, and conform to Federal Geographic Data Committee metadata standards..

4.4 MAPPING

GIS data are stored and managed using ESRI ArcGIS software, and are spatially referenced to the UTM Zone 10T projection, NAD 83 datum, and U.S. Survey Feet Units. Metadata are created for all GIS layers managed by WESTON on this project and conform to Federal Geographic Data Committee metadata standards.

5. REFERENCES

EPA (U.S. Environmental Protection Agency). 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4. February 2006. http://www.epa.gov/quality/qs-docs/g4-final.pdf

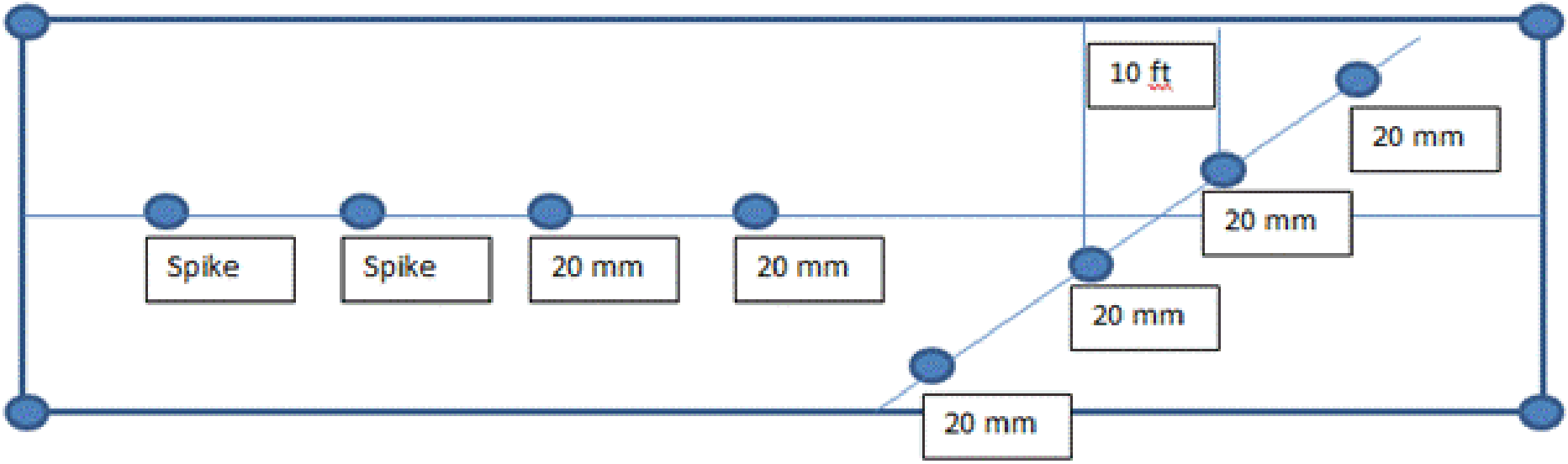
Naval Research Laboratory (NRL), 2009. MR/6110_09_99183 – EM61-MK II Response of Three Munitions Surrogates, 15 p.

USACE (U.S. Army Corps of Engineers). 2009. Performance Requirements for RI/FS Using DGM and Analog Methods, U.S. Army Corps of Engineers, Engineering and Support Center, Huntsville, November 12, 2009.

USACE (U.S. Army Corps of Engineers). 2009. DID MMRP-09-004, Geophysics.

USACE (U.S. Army Corps of Engineers). 2007. Engineer Manual (EM) 1110-1-4009, Engineering and Design – Ordnance and Explosives Response, June 2007.

FIGURES

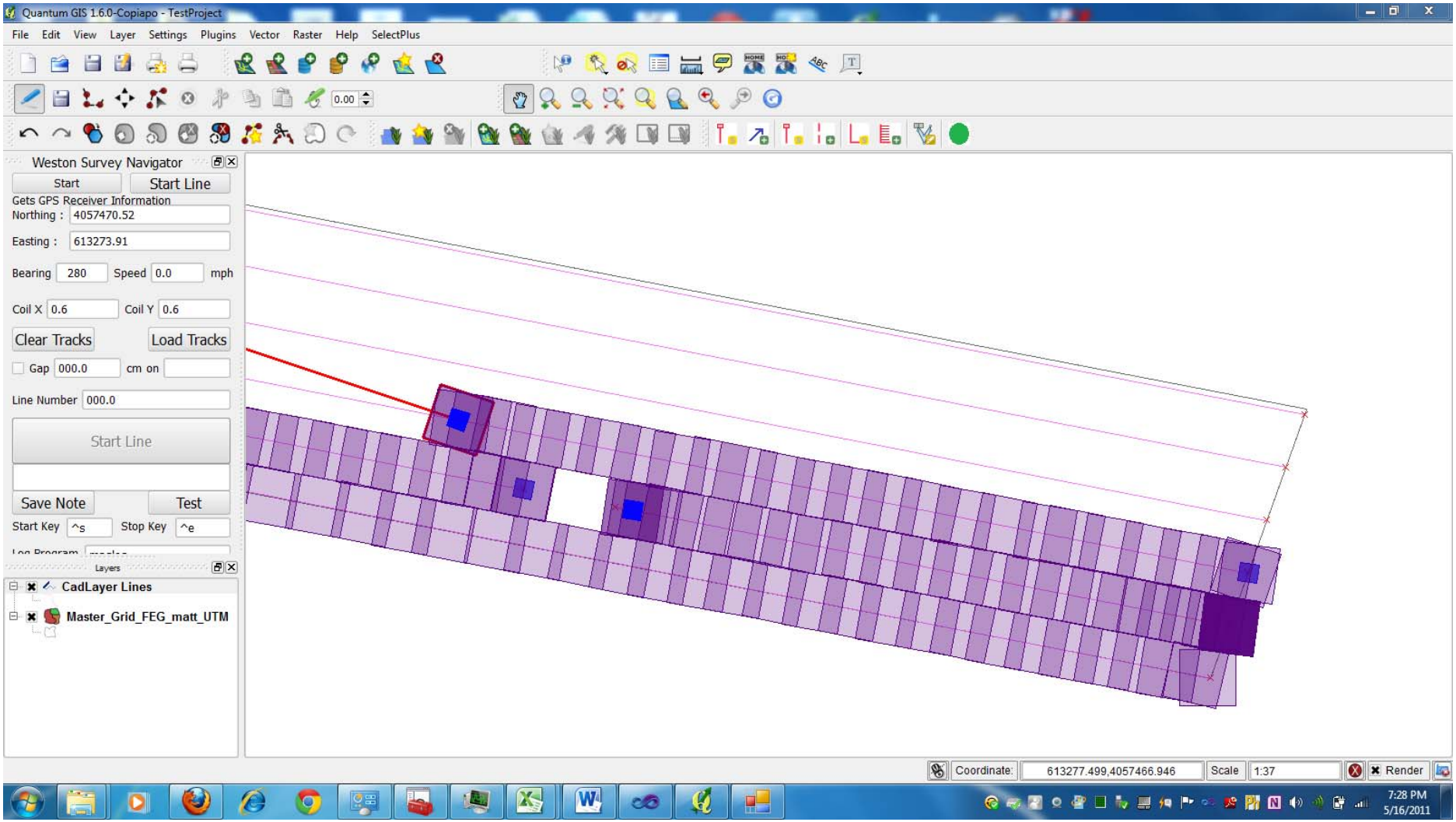


Clark County Public Works

FIGURE 1
EXAMPLE IVS LAYOUT

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

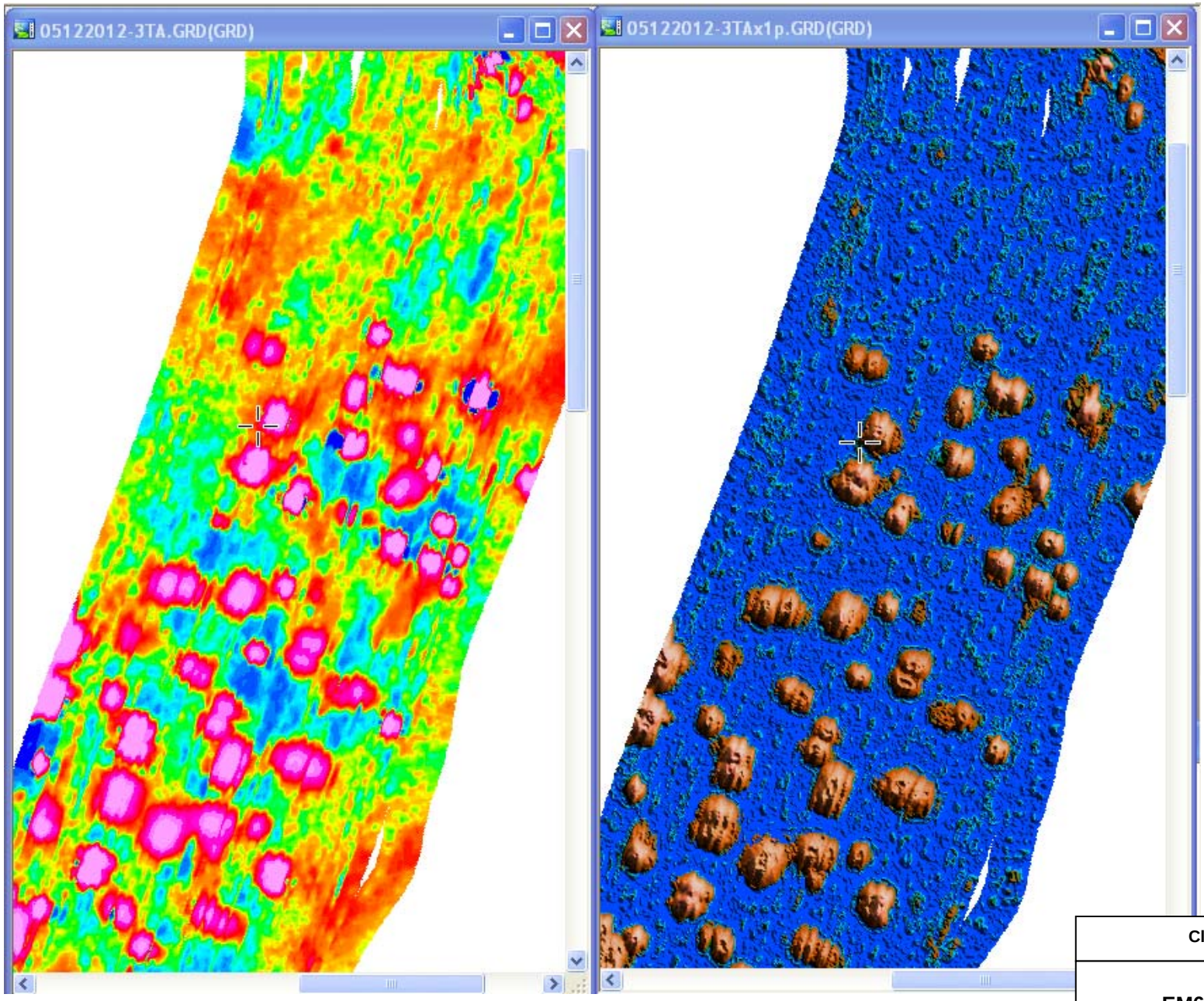


Clark County Public Works

FIGURE 2
DATA OUTPUT OF REAL-TIME GIS ON EM61 MK II CART

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



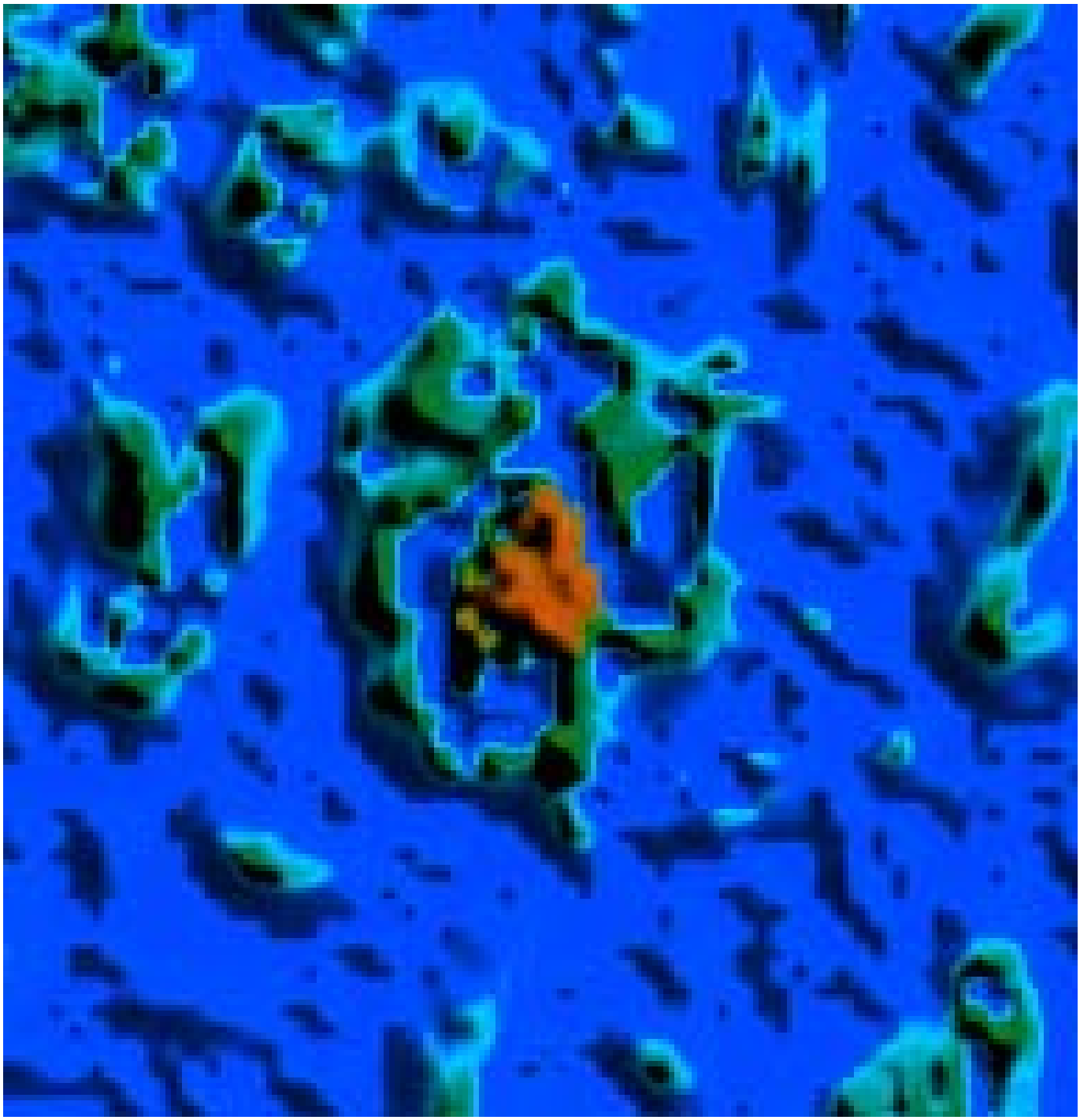
Note: Left side is raw data and right side is advanced representation

Clark County Public Works

FIGURE 3
EM61 MK II GEOPHYSICAL REPRESENTATION GPO

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

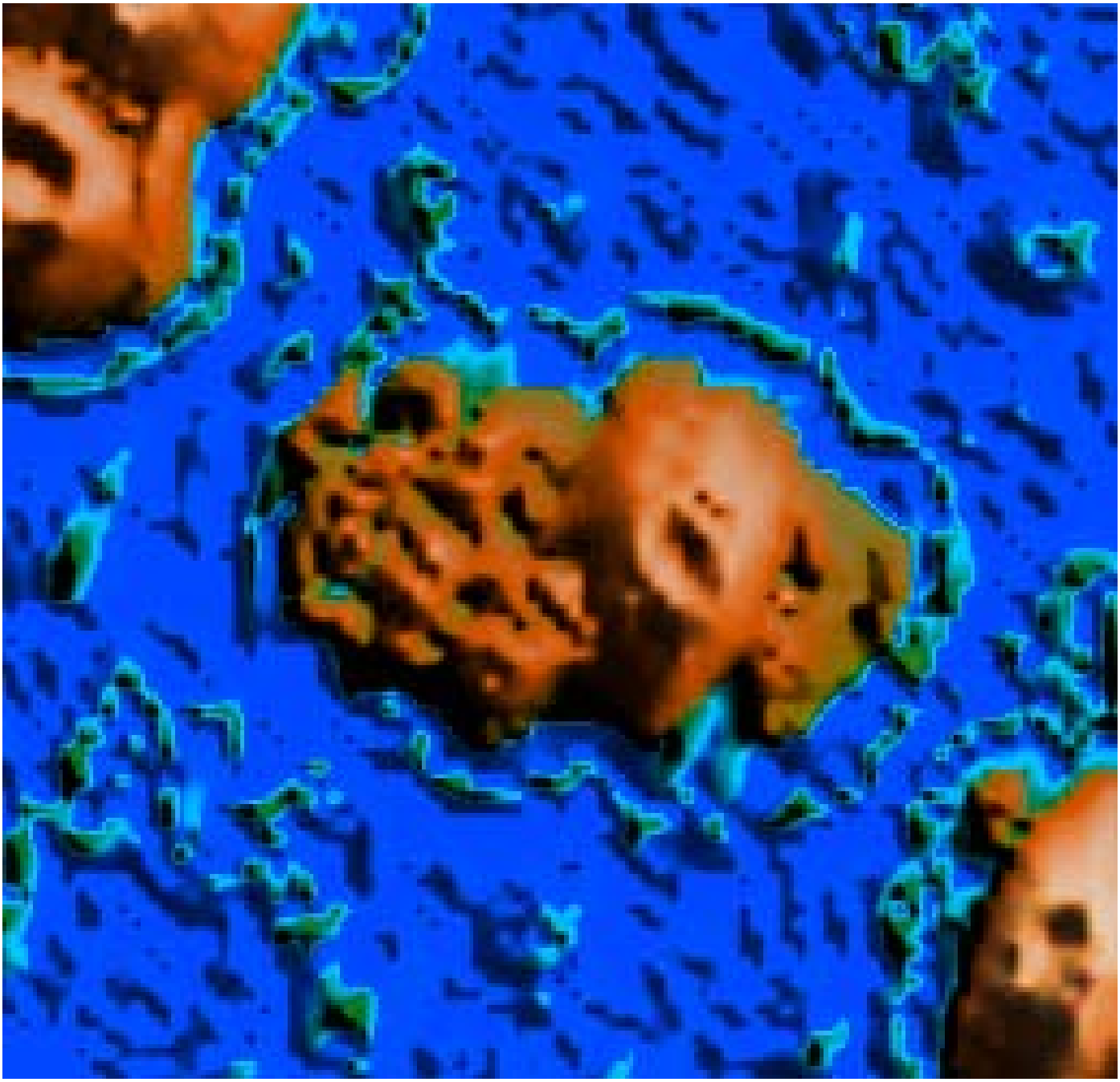


Clark County Public Works

FIGURE 4
ADVANCED REPRESENTATION OF 37 MM FUZE AT 7 INCHES BGS

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

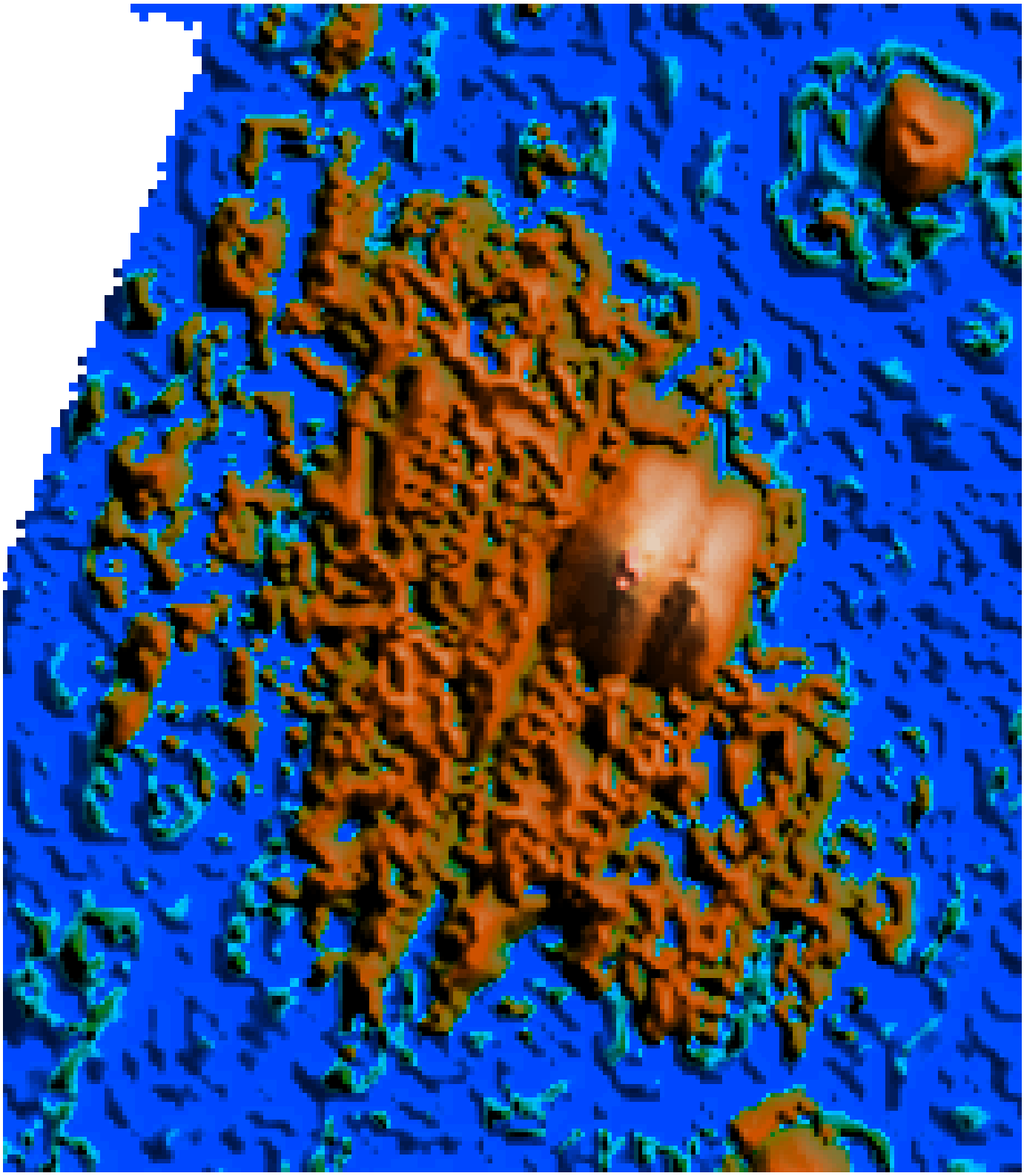


Clark County Public Works

FIGURE 5
ADVANCED REPRESENTATION OF SMALL ITEM BURIED ON TOP OF LARGER DEEPER ITEM

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

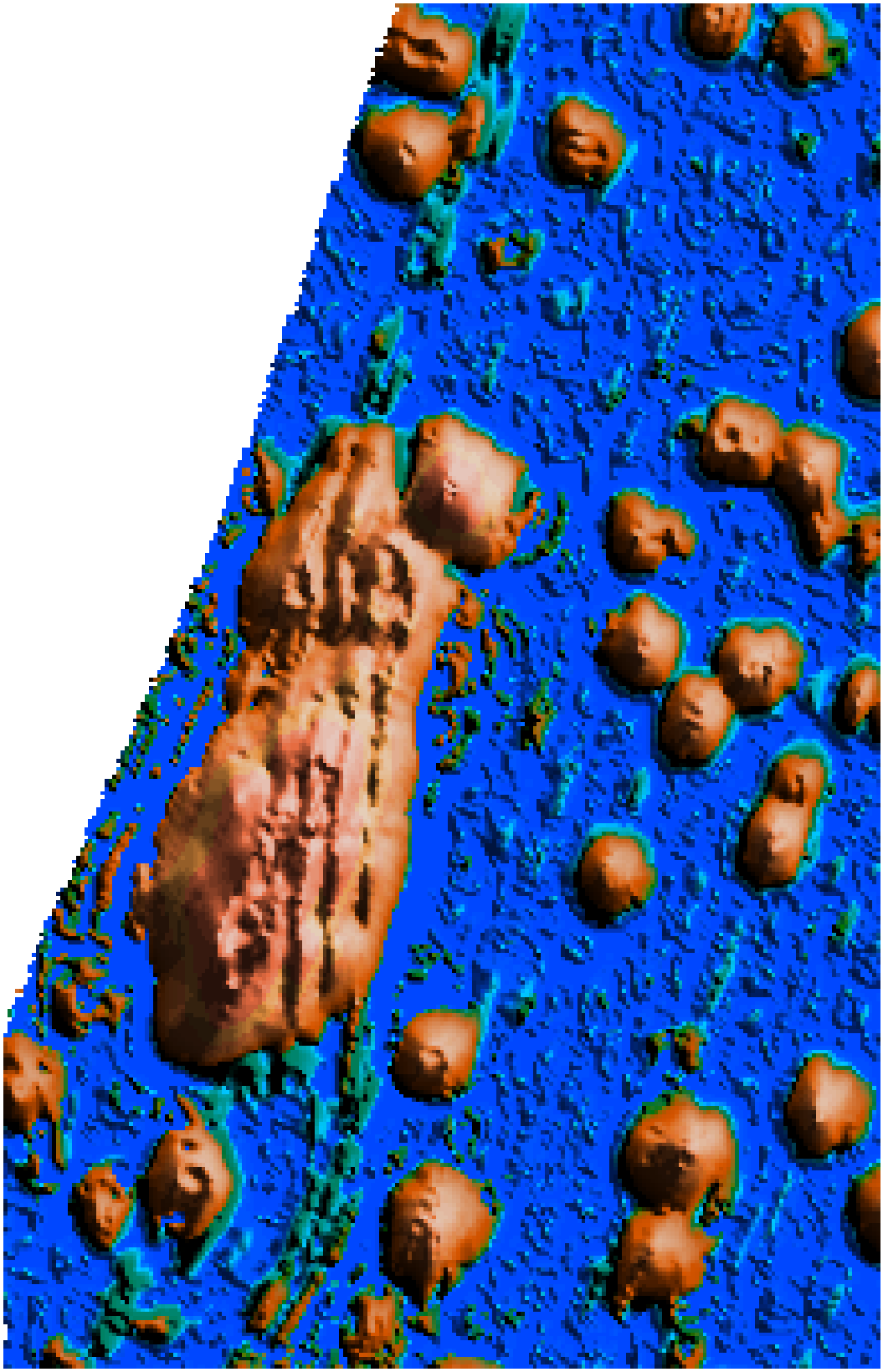


Clark County Public Works

FIGURE 6
ADVANCED REPRESENTATION OF A LIKELY DISCRETE LARGER ITEM

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS



Clark County Public Works

FIGURE 7
ADVANCED REPRESENTATION OF LIKELY BURIAL PIT

Former Camp Bonneville Military Reservation
Vancouver, Washington

WESTON SOLUTIONS

PHOTOGRAPHS

1. Four Coil EM61 MK II Towed-Array

2. EM61 MK II Modified Cart

3. EM61 MK II Hand Held

4. Electronic Hip Chain (Red Box) on EM61 MK II Cart

TABLES

Table 1
Industry Standard Objects Characterized for Use as Munitions Surrogates
(Adapted from NRL/MR/6110_09_99183)

Item	Nominal Pipe Size	Outside Diameter	Length	Part Number*	ASTM Specification
Small ISO	1 inches	1.315"(33 mm)	4"(102 mm)	44615K466	A53/A773
Medium ISO	2 inches	2.375" (60 mm)	8" (204 mm)	44615K529	A53/A773

Notes:
*Part number from the McMaster-Carr catalog.
*mm = millimeter

Table 2
EM61-MK II Configurations

System	Location	Use	Photograph
EM61 MK II Four Coil Tracked Towed Array	Open Areas	Primary DGM	1
EM61 MK II Modified Cart	Under tree canopy and in sensitive wetlands	Primary DGM	2
EM61 MK II Hand Held (HH)	All	Quality Control	3
EM61 MK II Modified Cart with electronic hip chain	Under tree canopy and in sensitive wetlands	Primary DGM	4

Table 3
DGM QC Test Frequency and Acceptance Criteria

Test Description	Acceptance Criteria	Power On	Start of Day	End of Day	1st Day of Project for Each Operator	IVS Twice Daily
Equipment Warm-Up	Equipment Specific (5-15 minutes)	**X**				
Record Sensor Positions	+/- 1-inch (2.54 cm)		**X**			
Personnel Test (Man-Portable Unit)	EM61-MK2 2mV p-p		**X**			
Vibration Test (Cable Shake)	Data profile does not exhibit spikes or shake induced offsets (> 2.5mV p-p)		**X**			
Static Background	Background: EM61-MK2 < 2.5 mV std dev or not vary more than 2.5 mV Peak to Peak.		**X**	**X**		
Static Spike	+/- 20 percent of standard item response		**X**	**X**		
6-Line Test (Man-Portable Unit)	Repeatable +/- 20 percent of response amplitude, +/- 2.4 ft for positional accuracy				**X**	
Repeat Data	Repeatable +/- 20 percent of response amplitude, +/- 2.4 ft for positional accuracy					**X**

Table 4
Measurement Quality Objectives

MQO	Measurement Performance Criteria	Testing Method
System and Data Positioning— Potential MEC items can be effectively reacquired.	Known surveyed positions and detected anomaly positions in DGM survey data for seed items and calibration spike objects are within specification offsets: EM61-MK2 grid surveys within +/-20cm. Line and fiducial grid corners are internally consistent within 30 cm on any leg or diagonal.	Use GSV process for full coverage surveys (ISO in IVS and production survey areas). Geodetic internal consistency through the use of grid corner spikes and seeds for line and fiducial surveys.
Data Density—Data density along line and across line are sufficient to detect MEC items.	EM61-MK2 grid survey: Across track spacing for EM61-MK2 full coverage surveys will be verified using IVS. 98% of data along line will be spaced no greater than 0.66 ft or GSV demonstrated separation. 95% of across track data will not exceed 2 ft.	Use Geosoft and spatial analysis tools to identify locations where data density does not achieve measurement performance criteria. Verify instrument functionality daily at IVS.
Anomaly Detection Performance—ISO and calibration spike object responses are repeatable.	ISOs and calibration spike objects will not vary more than 20% from test to test or ISO to ISO.	Monitor and compare spike test data daily before and after survey. Evaluate IVS results daily before and after survey.
Repeatability—Positional and detection performance are consistent for the duration of the project.	Review DQOs and spot trends or exceedances from performance criteria.	Use a quantitative review of test data daily and weekly. Evaluate detection and positional information at IVS daily.
Processing—Data processing and analysis are performed uniformly throughout the project.	Processing routines shall not alter the peak responses of anomalies by more than the lesser of 5% or 5mV (Does not apply to any advanced processing that is performed as part of the anomaly selection processes). All dig list targets are selected according to project design/selection criteria.	Evaluate on a dataset by dataset basis to confirm that all leveling and/or filtering routines do not alter the nature of the original measured response. Use consistent drift correction parameters in Geosoft. Visual and manual review of targets by grid or dataset by the Project and QC Geophysicist.
Anomaly Reacquisition— Selected anomalies are accurately reacquired and are comparable to their EM responses.	Anomalies are located to an accuracy of 2.4 ft (35 cm + ½ line spacing [38] = 73cm). Selected anomalies or polygons around clustered anomalies, with signatures greater than 1 m diameter, are relocated and marked within 0.25 ft of their dig list location.	Evaluate Dig Sheet results for false positives and compare results of anomaly types and their associated responses.

APPENDIX F
CONTRACTOR FORMS

Weston Solutions, Inc

Demolition Material Accountaility Form

1. Project Name: _____ 2. Project Location: _____ 3. Project No. _____

4. Explosive Description: _____ 5. Marks and Identification: _____

6. Manufacturer _____ 7. Storage Location: _____

8. Date Received	9. Quantity In	10. Unit of Issue	11. Quantity Out	12. Balance	13. Date Expended	14. Printed Name and Initials

Demolition Material Accountability Form -- Instructions

1. Project Name - Name assigned project. (For example: Tobyhanna Artillery Ranges)
2. Geographical location. (For example: Tobyhanna, PA)
3. Project Number - Assigned by Weston Corporate office
4. Explosives Description - Item name (For example: blasting caps, boosters, and detonating cord)
5. Marks and Identification - Identification as specified by the Manufacturer; Lot number for US military explosives
6. Manufacturer - manufacturer of item and country of origin (For example: Atlas Powder, USA; Govt
7. Storage Location - Proper name of storage magazine (For example: Igloo J180; Bldg. #18; COE Bunker #1; Mag 2)
8. Date Received - Date that the transaction occurs.
9. Quantity In - Quantity gained by the transaction; if no quantity is lost, mark column with -0-.
10. Unit of Issue - Unit of measure (For example: each, case, foot)
11. Quantity Out - Quantity lost by the transaction; if no quantity is gained, mark column with -0-.
12. Balance - Running balance of quantity on hand after the transaction.
13. Printed Name and Initials - Name and initials of individual performing the transaction (Print clearly).

Additional Instruction:

1. All data entered on Demolition Material Accountability Form should be entered in ink.
2. Lines not used on Demolition Material Accountability Form should be marked through with a line and marked “not used”.
3. When a mistake is written on Demolition Material Accountability Form, DO NOT ERASE OR WHITE OUT--- mark through data with single line, initial change, and make correct entry on new line.

DAILY REPORT
CAMP BONNEVILLE – GEOPHYSICAL SURVEYS

WORK ORDER NOS. 15048.001.001.0003.11	**DATE:**
WEATHER / TEMPERATURE: Sunny, some clouds, light winds	Low 60s / _____ °F
WORK LOCATION:	

GEOPHYSICAL PERSONNEL / AFFILIATION:	**Title/Duty:**
Matthew Gifford - WESTON	Sr. Geophysicist
Susan Young - WESTON	Data Manager
WESTON	Lead Field Geophysicist
WESTON	Field Geophysicist

HEALTH AND SAFETY: ☒ Daily H&S Brief and Discussion	**Safety Issues/Problems:**

WORK COMPLETED TODAY

GEOPHYSICAL SURVEYS (METHODS):

TARGET REACQUISITION:

MISCELLANEOUS:

OTHER NOTES:

WORK SCHEDULED FOR NEXT WORK DATE:

PREPARED BY:	***SIGNATURE:***

Grid Sweep Log

Project: Former Camp Bonneville Military Reservation

Area/ Grid # _____ PDA # _____ UXO Supervisor: _____
Date Started: _____ Cam # _____ UXO Technicians: _____
Date Completed: _____ Pic #s _____ _____

Total Anomalies	Total MD	Total MEC	Pounds Non-MEC Scrap

# MEC	#MD	NOMENCLATURE	DEPTH

ACTION:	DATE	SIGNATURE	REMARKS:
Analog Sweep Complete			
Excavation Complete			
Quality Control Complete			
Client Quality Assurance Complete			

Weston Solutions, Inc.

Magazine Data Card

1. Project Name, Location:	Project Number:	3. Explosive Manufacturer	4. Marks of Identification:
5. Storage Location:	6. Explosive Description:		

7. Date	8. Action/Purpose	9. Qty In	10. Qty Out	11. Balance	12. Printed Name	13. Signature

Magazine Data Card Instructions

1. Project Name, Location - Name assigned project and geographical location. (For example: TOAR Artillery Ranges,Pennslyvania)
2. Project Number - Assigned by Weston Corporate office
3. Explosive Manufacturer - Manufacturer of item and country of origin (For example: Atlas Powder, USA; Govt
4. Marks and Identification - Identification as specified by the Manufacturer; Lot number for US military explosives
5. Storage Location - Proper name of storage magazine (For example: Igloo J180; Bldg. #18; COE Bunker #1; Mag 2)
6. Explosives Description - Item name (For example: blasting caps, boosters, and detonating cord)
7. Date - Date the transaction occurs.
8. Action/Purpose - Purpose for transaction. (For example: intial receipt, inventory, demolition use, return to inventory, transfer, and previous balance.)
9. Quantity In - Quantity gained by the transaction; if no quantity is lost, mark column with -0-.
10. Quantity Out - Quantity lost by the transaction; if no quantity is gained, mark column with -0-.
11. Balance - Running balance of quantity on hand after the transaction.
12. Printed Name and Initials - Name of the individual performing the transaction (Print clearly).
13. Signature - Signature of the individual performing the transaction.

Additional Instruction:

1. All data entered on Magazine Data Card Form should be entered in ink.
2. Lines not used on Magazine Data Card Form should be marked through with a line and marked “not used”.
3. When a mistake is written on Magazine Data Card Form, DO NOT ERASE OR WHITE OUT--- mark through data with single line, initial change, and make correct entry on new line.

Form M-1
Munitions and Explosives of Concern Information Form

Date/Time:

Tracking Number:

1. Were item(s) recovered from grid: ☐ Yes ☐ No

2. Items removed by:

3. Items moved to Magazine ☐ Yes ☐ No

4. Were item(s) destroyed on Site? ☐ Yes ☐ No

5. If yes, who destroyed the item(s)? Name:

6. MEC ITEM(S) ENCOUNTERED:

MEC Nomenclature	Qty			Disposition

7. WESTON PERSONNEL NOTIFIED AT (TIME):

8. CLARK COUNTY PERSONNEL NOTIFIED AT (TIME):

_____

WESTON UXO Representative: Name and Signature

Safety Inspection Log

Date: _____ Time: _____ Contract Number: _____

Delivery Order Number: _____ Location: _____

Weather Conditions: _____

Type of Inspections: Daily _____ Weekly _____ Special _____ Reinspection _____

Location inspected: (List by grid number, coordinates, or description) _____

Activity inspected: _____

II. Inspection Requirement	Satisfactory	Unsatisfactory	N/A
Surface Sweep			
Subsurface Sweep			
Evacuation Technique			
Personal Protection Equipment			
Work Practices			
Site Control			
First Aid Equipment			
Fire Fighting Equipment			
Explosives Transportation			
Explosives Storage			
Disposal Operations			

Overall Inspection Results: Satisfactory _____ Unsatisfactory _____

III. Comments: _____

_____

- Work stopped due to safety violation: Yes _____ No _____
- Safety violations noted: _____
- Personnel involved: _____
- Corrective Measures _____
- Re-inspection required Yes _____ No _____

IV. Signatures: I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (if necessary).

_____ _____

Site Safety Officer Sr. UXO Supervisor/Project Manager

SAFETY MEETING ATTENDANCE

Date:	Time:	**Contract**:
Location: Former Camp Bonneville Military Reservation – Vancouver, Washington		
Weather Conditions:		
Safety Meeting Topics: UXO SAFETY, SLIPS TRIPS AND FALLS,		

NAME	SIGNATURE	COMPANY

I certify that the personnel listed on this roster received the briefing described above. Site personnel not attending this meeting will be briefed before beginning their assigned duties.

_____ _____

UXO Safety Officer Date

Site Visitors Log

Contract No. _____ Delivery Order No. _____ Location: _____

Date	Name	Company	Telephone Number	Safety Briefing Received	Time		Escort Required
					In	Out	

Sub-CONTRACTOR DAILY PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE	**00/00/2012**		
CONTRACT NO	**LOCATION** Former Camp Bonneville Military Reservation	**REPORT NO**	15048-0000
Sub-CONTRACTOR:	B&B Brush Clearing	**FORMAN:**	

AM Weather (data listed Monday through Friday)	PM Weather	MIN TEMP (F)	MAX TEMP (F)	PRECIP (IN)
Partly cloudy, winds 5-10mph, chance of rain	Partly cloudy, some sun, winds 5-10mph	44	60	0.0

WORK PERFORMED TODAY

WORK LOCATION AND DESCRIPTION	EMPLOYEE NAME	NUMBER	Title/Position	HRS

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE?	☐ YES	☐ NO	TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO	CUMULATIVE TOTAL OF WORK HOURS FROM START OF CONTRACT	
WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)	☐ YES	☐ NO		
WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)	☐ YES	☐ NO		

LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED ☒ SAFETY REQUIREMENTS HAVE BEEN MET.

WESTON conducted a morning tailgate safety brief. Heavy equipment inspection/safety checks and environmental checks around site and equipment. Safety put out dust monitors.

Description of Equipment/Material Received

Owner	Description of Equipment Used Today	Model and Make	Hours Idle	Hours Used	Comments

VISITORS

NAME	TITLE	COMPANY/AGENCY	PURPOSE OF VISIT

Tasks Performed Today

AM TASKS

PM TASKS

Problems encounter and solutions employed:

Sub-Contractor:	Foreman/Supervisor:	Date:

Daily Report

Date:	Contract Number:
Delivery Order Number:	Location: Former Camp Bonneville Military Reservation
Weather Conditions:	

I. Work Summary:

Equipment comments:

II. Instructions Received:

III. Safety Comments: All personnel attended the daily safety brief.

IV. UXO Summary

Type	**Location**

Demolition Supplies Used:

Electric blasting caps		Detonation cord (feet)		Explosive boosters		Perforators	

V. Personnel/Equipment Utilization:

a. Personnel On-site	Position	Location/ Work	Hours
1.	**SUXOS**		
2.	**UXOSO**		
3.	**UXOQCS**		
4.	**Team Leader**		
5.	**Asst Team Leader**		
6.	**Tech II**		
7.	**Tech II**		
8.	**Tech I**		
9.	**Tech I**		
10.	**Team Leader**		
11.	**Asst Team Leader**		
12.	**Tech II**		
13.	**Tech II**		
14.	**Tech I**		
15.	**Tech I**		
16.	**Geo**		
17.	**Escort**		
18.	**Escort**		
19.	**Escort**		

b. Equipment	On hand	Used	hours used this week
WESTON PICKUP TRUCKS	**12**		64
F3 UXO METAL DETECTORS	**3**		24
ML3 MAGETIC LOCATORS	**15**		24
HAND HELD RADIOS	**16**		64
GPS (TRIMBLE)	**4**		8
PDA's	**7**		24
BACKHOE	**1**		
KUBOTA ATV	**1**		0
EM-61 (hand held)	**4**		24
EM-61 Sled	**1**		
EM-61 Cart	**2**		

VI. Comments/Concerns:

VII. Signature(s)/ Date

Senior UXO Supervisor	Task Manager

UXO QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE		
Contract:	**LOCATION** Former Camp Bonneville Military Reservation	**Report #** 15048-0000
CONTRACTOR Weston Solutions, Inc.	**UXOQCS**	

EQUIPMENT USED	**WEATHER**	**MAX TEMP (F)**	**MIN TEMP (F)**	**PRECIP (IN)**
EM-61 HH, F3 UXO, ML3	**SUNNY/CLOUDY**			0.00

WORK PERFORMED TODAY

UXOQCS -	**DATE**	Task Manager	DATE

WEEKLY ANALOG LOCATOR CHECKLIST AND RETURN PROCEDURE

FORMER CAMP BONNEVILLE MILITARY RESERVATION

MONTH/ YEAR: _____

INSTRUMENT: _____

SERIAL #:_____

ASSIGNED TO: _____

Day	Check for Damage	Check Battery Level	IVS Check	Clean Instrument	Comments
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					

APPENDIX G
STANDARD OPERATING PROCEDURES

SOP - 1
MEC ANOMALY AVOIDANCE
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICATION

The objective of this standard operating procedure (SOP) is to provide guidance and general reference information for the avoidance of potential Munitions and Explosives of Concern (MEC) during performance of professional survey, grid stake out, brush clearing and DGM survey activities. This SOP pertains only to anomaly avoidance activities. If an anomaly is detected, it must be avoided, including relocation of proposed activities.

WESTON shall provide all labor, materials, and equipment necessary to perform anomaly avoidance support for performance of the required site activities in accordance with EP 75-1-2 (USACE, 2004). WESTON shall furnish the required unexploded ordnance (UXO)-qualified personnel, equipment, instruments, and transportation, as necessary, to accomplish the required services and furnish reports and other data, together with supporting material developed while providing MEC support services. For anomaly avoidance on a Hazardous Toxic and Radiological Waste (HTRW) site with known or suspected MEC, the contractor shall provide a UXO team consisting of a minimum of two personnel, one of whom must be a UXO Technician II. This individual will be the UXO team leader. The UXO team must be on-site during all field activities. The most successful geophysical detection systems for MEC rely on one of two technologies, magnetometry or electromagnetics. Magnetometers are limited to detecting ferrous items. Electromagnetic detectors can detect any conductive metal.

MEC anomaly avoidance support will be provided by UXO Technicians to prevent accidental exposure to potential MEC while performing field work. The UXO Technician(s) will accompany all personnel while working within the boundaries of the Former Camp Bonneville Military Reservation.

During the implementation of anomaly avoidance procedures, WESTON shall provide adequate professional supervision and quality control to ensure the quality, safety, and completeness of the work. UXO personnel using personal protective equipment (PPE) will be knowledgeable of the limitations of the selected PPE as well as the reduced performance levels the equipment might impose on them when they are conducting assigned tasks.

No single detection system can effectively detect all types of military munitions at all locations and depths. There are many cases where UXO can penetrate deeper than geophysical instruments can currently reliably detect. On such sites, it is possible that undetected UXO remains deeper than it can be detected from the existing ground surface.

2. EQUIPMENT

- Field logbook
- Flagging
- Obtain utility clearance and/or permits
- Frequency-domain electromagnetics (e.g., Subsurface Instruments ML-3 Locaters)
- Time-domain conductivity electromagnetics (e.g., Minelabs F3 UXO All-Metals Detectors)

3. PROCEDURE

3.1 GENERAL PROCEDURE

USACE has set forth personnel standards applicable to all UXO personnel. These qualifications and standards, which detail the educational, experience, and training requirements for UXO personnel, are available in EP 1110-1-18 (USACE, 2000) and ER 385-1-95 (USACE, 2003 and 2004). WESTON personnel shall be in compliance with these requirements prior to conducting MEC support and/or avoidance activities.

The UXO-qualified personnel shall precede the escorted personnel and visually search the surface of the proposed pathway for items of concern. The UXO-qualified personnel shall communicate visual observations to escorted personnel and avoid contact with any discovered MEC or MEC-related items by leading the group around them. The UXO-qualified personnel shall place flagging adjacent to any discovered MEC for subsequent visual reference.

An access survey must precede any type of investigation activity or ingress/egress within an area with known or suspected MEC. The UXO escort shall locate an access route and investigation site that is free of anomalies, using an appropriate geophysical detection instrument. The access route shall be at least twice as wide as the widest vehicle that will use the route. If anomalies or

surface MEC are encountered, they shall be marked with flagging, and the access route or investigation area shall be relocated to avoid contact. The boundary of each access route and investigation site shall be marked using survey flagging and pin flags.

The UXO escort shall establish a system of flagging colors that will distinguish anomalies, surface MEC, and route boundaries from each other as well as from any utility markings at the site. No personnel shall be allowed outside of the surveyed areas.

3.1.1 Professional Survey

The UXO escort must conduct an access survey of the routes to and from the proposed survey site as well as an area around the survey site. The UXO escort must visually survey the surface of each proposed survey marker or control point for any indication of MEC. In addition, the UXO escort must conduct an analog sweep of the proposed survey locations using geophysical instruments capable of detecting the smallest known or anticipated MEC to a depth of 1 foot below ground surface. If anomalies are detected at a proposed sampling location or too many anomalies are detected in a general area of interest, the UXO escort will direct the surveyors to select a different location to place the survey monument or control point.

3.1.2 Brush Clearing

The UXO escort must conduct an access survey of the routes to and from the proposed site as described above.

The UXO escort must ensure the area is clear of surface MEC prior to the start of brush clearing activities.

If surface MEC is detected, the UXO escort must mark the location to ensure the brush cutters stay away from that area and contact the SUXOS for further instructions.

3.2 GENERAL CONSIDERATIONS

During a comprehensive review of archival records, no evidence of the potential existence of recovered chemical warfare material (RCWM) or agent breakdown products byproducts was discovered. In the event that RCWM or munitions with unknown fillers are encountered, all

work shall immediately cease, and project personnel shall be evacuated along cleared paths upwind from the discovery. A team consisting of a minimum of two personnel shall immediately secure the area to prevent unauthorized access.

Since the purpose of MEC support during escort activities is anomaly avoidance, the UXO escort is not tasked to perform MEC disposal. MEC disposal will not be covered in the planning documents for the project; therefore, the UXO escort is not capable or equipped to perform MEC disposal. In the event that MEC is encountered that cannot be avoided or, based on its fuzing or current condition, presents an imminent hazard requiring immediate attention, the UXO escort shall notify the SUXOS. The UXO ESCORT shall not destroy any of the MEC encountered. The SUXOS will notify the appropriate UXO team of the MEC discovery, and the UXO team will respond in an appropriate manner.

All mishaps associated with execution of project activities shall be investigated and analyzed. Information reflected on the report forms provides the basis to investigate the accident, analyze the cause, and identify what corrective actions may be implemented to prevent similar occurrences. All mishaps shall be reported in accordance with USACE Supplement 1 to AR 385-40 (USACE, 1993) and EM 385-1-1 (USACE, 2008).

For anomaly avoidance, the senior UXO-qualified person on-site is responsible for mishap reporting. For contracts under the supervision of the district, mishaps shall be reported to the district safety office. USACE district personnel will report through Command channels to the Headquarters, U.S. Army Corps of Engineers Safety and Occupational Health Office.

4. REFERENCES

USACE (U.S. Army Corps of Engineers). 1993. Supplement 1 to AR 385-40, Accident Reporting and Records. Change 1, April 1993 (Supplement 1 to AR 385-40, March 1990). http://140.194.76.129/publications/ (Accessed 24 February 2010).

USACE (U.S. Army Corps of Engineers). 2000. EP 1110-1-18, Military Munitions Response Process. April 2000 and Errata December 2007 http://140.194.76.129/publications/ (Accessed 24 February 2010).

USACE (U.S. Army Corps of Engineers). 2003. EP 385-1-95b, Explosives Safety Submission. March 2003 and Errata December 2007. http://140.194.76.129/publications/ (Accessed 24 February 2010).

USACE (U.S. Army Corps of Engineers). 2004. EP 385-1-95a, Basic Safety Concepts and Considerations for Munitions and Explosives of Concern (MEC) Response Action Operations. August 2004 and Errata September 2006 and January and December 2007. http://140.194.76.129/publications/ (Accessed 24 February 2010).

USACE (U.S. Army Corps of Engineers). 2004. EP 75-1-2, Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities. August 2004 and Errata December 2007. http://140.194.76.129/publications/ (Accessed 24 February 2010).

USACE (U.S. Army Corps of Engineers). 2008. EM 385-1-1, Safety and Health Requirements Manual. September 2008. http://140.194.76.129/publications/ (Accessed 24 February 2010).

SOP - 2
SURVEYING
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICATION

The objective of this operating practice is to identify the specific data and reporting requirements for the measuring of coordinates and elevations for environmental sampling locations.

The objective of the surveying effort is to provide accurate and well documented coordinate and elevation information that is referenced to an appropriate benchmark. It is equally important that the calculated coordinate and elevation information is reported in a pre-established format to facilitate the timely uploading of this information into a project's locational database. An increasing number of environmental projects have begun to use integrated geological, hydrological, analytical, and geographical databases to effectively manage, analyze, and report the large amounts of technical information. The link between the project's technical databases and the locational database provides a system for the generation of accurate data presentations (including two-dimensional (2-D) and three-dimensional (3-D) maps and cross-sections). Thus, when planning for a survey effort, or preparing a survey Request for Proposal (RFP), the scope of work (SOW) should include a detailed explanation of the deliverable format for the survey information.

2. EQUIPMENT

- Surveying equipment
- Calculator
- Knife or small saw to notch top of casing survey point
- Radio or cell phone

3. PROCEDURE

All surveying activities shall be performed under the direct supervision of a certified land surveyor. Locations and elevations surveyed shall be measured as the distance in feet from a reference location(s), which is tied to the applicable state plane coordinate system (SPCS). The surveys shall be third order Class II control surveys in accordance with the Standards and Specifications for Geodetic Control Networks (Federal Geodetic Control Committee, 1984). Horizontal precision shall be to the nearest foot. In the SPCS, the x-coordinate is the east-west

axis, and the y-coordinate is the north-south axis. All x,y values shall be positive. Elevations shall be surveyed to a precision of +0.01 foot and referenced to the National Geodetic Vertical Datum of 1929 (NGVD of 1929) or North American Vertical Datum, 1988 Adjustment (NAVD 88) depending on project requirements. These surveys should be connected by third order leveling to the NGVD of 1929 or NAVD 1988 in accordance with the Standards and Specifications for Geodetic Control Networks.

3.1 SURVEYING LOCATIONS

The surveyor will survey the location (referenced to the applicable coordinate system) and ground elevations of the Instrument Verification Strip (IVS), the perimeter of the wetlands and install various control points. All locations will require the following survey measurements:

- State plane coordinate location.

3.2 ELECTRONIC DELIVERABLE

The survey information for each location shall be delivered via email. The electronic information can be in the form of either Microsoft Excel spreadsheet files or standard ASCII data files. CAD drawing (DWG-type) files may also be required.

Each electronic file MUST contain the following fields or entries for each location surveyed:

- Client name.
- Site name.
- Site number (NA if not applicable).
- Location ID number.
- Location type (e.g., ICS, control point, wetlands perimeter).
- Northing (state plane coordinate in feet).
- Easting (state plane coordinate in feet).
- Ground surface elevation (excluding surface water/sediment sampling locations).
- Reference elevation (see below for definitions).

All fields must be filled out. If a particular field is not applicable then “NA” should be placed in that particular field.

3.3 SURVEYOR NOTES

One copy of all field notes collected during the performance of the survey effort plus any survey data reduction notes shall be delivered to WESTON, along with the survey electronic deliverable, and shall be maintained in the project file.

All topographic survey efforts conducted under contract will be certified by a surveyor with a current Washington State surveyor's license.

The topographic survey will be completed as near to the time of field work completion as possible. Survey field data (as corrected), including loop closures and other statistical data in accordance with the Standards and Specifications referenced above, will be provided. Closure will be within the horizontal and vertical limits given above. These data will be clearly listed in tabular form: the coordinates (and system) and elevation (ground surface and top of well), as appropriate, for all borings, wells, and reference marks. All permanent and semipermanent reference marks used for horizontal and vertical control (e.g., benchmarks, caps, plates, chiseled cuts, rail spikes) will be described in terms of their name, character, physical location, and reference value. These field data will become part of the project records.

4. REFERENCES

Federal Geodetic Control Committee. 1984. Standards and Specifications for Geodetic Control Networks.

SOP - 3
MECHANICAL VEGETATION CUTTING
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of mechanical vegetation cutting operations.

2. SCOPE

All personnel performing operations utilizing mechanical equipment for vegetation cutting will conform to this SOP. This SOP is not a stand-alone document, and all personnel will become familiar with associated documents and/or manuals related to this operation.

3. REGULATORY REFERENCES

Weston Solutions, Inc., Corporate Safety and Health Program

OSHA General Industry Standards, 29 CFR 1910

OSHA Construction Standards, 29 CFR 1926

USACE EM 385-1-1, Safety and Health Requirements Manual

AR 385-10, Army Safety Program

Operator's Manual and Manufacturer's Recommendations

4. RESPONSIBILITIES

4.1 PROJECT MANAGER (PM)

The PM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training.

4.3 UXO SAFETY OFFICER (UXOSO)

The UXOSO ensures that all mechanical vegetation cutting operations are being conducted in a safe manner in accordance with the work plan and this SOP.

4.4 UXO ESCORT/GROUND SAFETY OBSERVER

The UXO Escort/Ground Safety Observer ensures that personnel and equipment remain within the site, and marks any munitions and explosives of concern (MEC) encountered and reports their location to the SUXOS.

5. MECHANICAL VEGETATION CUTTING OPERATIONS

Vegetation cutting operations will be consistent with the operator's manual and terrain features, and permits the Ground Safety Observer to perform those duties as directed to include a visual search/survey of the area(s) to be worked in.

- Personnel will not enter within 50 feet of an operating piece of equipment. If, at any time, personnel enter closer than 50 feet, the operator will immediately stop, return the engine to idle speed, and disengage power to all attachments.
- A communications check with the team personnel prior to operations commencing will be conducted. Hand signals are devised and used as a secondary means of communication. All team personnel must know these hand signals prior to operations commencing.
- The direction and manner in which the vegetation is to be removed will be directed by the team leader. Prior to cutting operations commencing, a visual search/survey is conducted to determine the hazards that may be encountered, including MEC, terrain slope, vegetation, wildlife, and environmental concerns. The team leader will also determine the personal protective equipment (PPE) requirements based on the identified hazards.
- The Ground Safety Observer precedes the equipment and performs a visual search for MEC, ordnance scrap, rats' nests, surface debris, and any other obstruction/object that may pose a hazard to team personnel. Hazardous items, impassable terrain, or vegetation that may affect operations will be marked and team personnel notified. The operator shall follow a route selected by the Ground Safety Observer while operations are ongoing.
- Team personnel will ensure that a 6-inch ground clearance is maintained during cutting operations. Those areas marked as hazards are to be avoided.
- MEC or MEC-related items encountered are marked and avoided. Notification of these items will be made to the SUXOS.

5.1 SAFETY

Safety is paramount. All personnel will observe those safety precautions/warnings that apply, or may apply, to vegetation cutting operations. Those listed below are general in nature and personnel will need to review applicable publications for more specific safety precautions/warnings. Distances are the minimum required.

- Maintain 200 feet from essential non-UXO personnel; UXO personnel engaged in intrusive work; and other mechanical equipment (e.g., backhoe).
- Maintain 50 feet between equipment and team personnel.
- Distances may be increased by the UXOSO, as determined by site history, MEC items encountered, terrain features, and other factors that may apply.
- Use equipment safety features (e.g., guards).
- Safety precautions/warnings found in the operator's manual(s)/manufacturer's publication(s) will be observed.
- Maintain 6 inches of ground clearance during cutting operations.
- Communications will be maintained between the UXO Escort and the operator at all times.
- Maintain site control.
- Observe safety precautions for items encountered or suspected.
- Ensure PPE is serviceable and worn/used in a proper manner.

6. PERSONAL PROTECTIVE EQUIPMENT

Level D PPE will be required for personnel engaged in mechanical vegetation cutting. Clothing includes, but is not limited to:

- Coveralls or work clothing as prescribed
- High visibility Safety Vests
- Work gloves, leather or canvas as appropriate
- Safety glasses
- Face shields when appropriate
- Hard hats when working within 100 feet of equipment
- Hearing protection, noise attenuators or ear plugs when within 50 feet of equipment
- Dust mask, as required by wind conditions and/or the presence of airborne particulate matter

- Other PPE as needed (e.g., face shield, Kevlar chaps, etc.)

7. TRAINING

All personnel who work on a mechanical vegetation cutting crew will be qualified and certified through machine-specific, site-specific, and on-the-job training. This training will consist of:

- Mechanical operations and maintenance of the vegetation cutting equipment
- Features of the equipment and its operational limits and characteristics
- Safety parameters relevant to mechanical operations

SOP - 4
CHIPPING OPERATIONS
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of chipping operations in areas that are considered environmentally sensitive.

2. SCOPE

This SOP applies to all personnel involved in the conduct of chipping operations either using a disk-type or rotary-drum-type chipper.

3. REGULATORY REFERENCES

Weston Corporate Safety and Health Program (FLD47)

OSHA General Industry Standards, 29 CFR 1910

OSHA Construction Standards, 29 CFR 1926

USACE EM 385-1-1, Safety and Health Requirements Manual

AR 385-10, Army Safety Program

Operators Manual and Manufacturers Recommendations

4. RESPONSIBILITIES

4.1 PROJECT MANAGER (PM)

The PM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training.

4.3 UXO SAFETY OFFICER (UXOSO)

The UXOSO ensures that all chipping operations are being conducted in a safe manner, in accordance with the appropriate work plans and this SOP.

4.4 CHIPPER TEAM LEADER

The chipper team leader is responsible for the daily maintenance, upkeep, and repair of the machine, and certification of operator personnel.

4.5 QUALIFIED BIOLOGIST

The Qualified Biologist will identify locations where mulch is not to be spread, to avoid affecting the re-establishment of Habitat Management Plan annual plants.

5. CHIPPING OPERATIONS

5.1 GENERAL

Chipping is required whenever vegetation removal is being conducted in the Wetlands Area. In addition, it may be necessary to conduct chipping to improve ground visibility and safety.

5.2 CHIPPER OPERATION

The chipper will be manned by brush feeders (laborers). When feeding material into the chipper, feeders must exercise care not to place hands, or any other parts of the body, or loose clothing on the feed table when the chipper is in operation. Care will be taken not to reach past the "SAFE" point established on the feed table/chute. This point varies between chipping machines and will be identified to all personnel.

- A push stick of material consumable by the chipper will be available, one on either side of the chipper, for pushing material into the chipper when it is necessary to probe beyond the safe point.
- Brush draggers will be employed to drag brush to the feeders. The draggers will trim the brush as necessary to fit it into the chipper, and pass it to the feeders.
- Limbs and wood stock 3 inches or greater in diameter need not be chipped. These items can be left in the field as a source of habitat for bugs, salamanders, and other creatures.

- The chipper team leader must oversee the operation with regard to safety, work progress, weather/wind conditions, materials being chipped, and other factors that affect the operation.
- Poison oak will not be chipped by itself. If it is entangled within brush, it will be chipped based on the team leaders' discretion.
- Any time the chipper is operated while disconnected from the team vehicle; the chipper's wheels will be blocked or chocked to prevent it from rolling.
- Fluid levels and gauges will be checked periodically and at every break.

5.3 CHIPPED MULCH

Mulch will, in most locations, be spread over the area from which the original brush material was cut and be limited to 3 inches in depth. Mulch will not be spread any closer than 5 feet from the roadsides whenever possible. Mulch will not be spread in certain locations where sensitive annual plant habitat occurs, as identified by the Qualified Biologist.

5.4 FIELD SANITATION

The team decontamination station will be located at least 50 feet upwind of the chipping operation.

5.5 HEARING CONSERVATION

The first day, the noise level will be measured using an appropriate measuring device(s). Readings will be taken at the machine, as well as in the vicinity of the machine, and noise attenuation devices selected and issued.

6. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Modified Level D PPE will be required for personnel engaged in chipping operations to include:

- Coveralls – appropriately taped at ankles and openings
- Surgical/inner gloves
- Leather or canvas work/outer gloves
- Leather gauntlets
- Work boots – leather or suitable material
- Tyvek hood when in poison oak

- Hard hats
- Hearing protection −brush feeders will wear noise attenuating helmets or ear plugs, both will be worn if uninterrupted work period extends beyond 45 minutes
- Brush draggers will wear noise attenuating helmets or ear plugs
- Eye protection −all personnel will wear safety glasses, brush feeders will also wear face shields/screens
- Disposable dust masks - at any time that dust is being generated, disposable dust masks will be worn

No one will approach within 35 feet of an operating chipper without the appropriate PPE and hearing protection.

7. TRAINING

All personnel who work on a chipping crew will be qualified and certified through machine-specific, site-specific, and on-the-job training. This training will consist of:

- Mechanical operations and maintenance of the chipper
- Features of the chipper and its operational limits and characteristics
- Safety parameters relevant to chipping operations

SOP - 5
MONITORING OF DUST GENERATING ACTIVITIES
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. APPLICABILITY

This document provides requirements for performing air monitoring or abatement oversight during abatement, demolition, grading, excavation, soil sifting, or other significant soil disturbance activities.

2. REGULATORY REQUIREMENTS AND GUIDELINES

The UXOSO will be performing the air monitoring and is responsible for collecting air samples and dust data primarily for compliance with the Washington State Department of Ecology (WDOE) Rules. The WDOE is the local enforcement authority for the National Emission Standards for Hazardous Air Pollutants (NESHAP). Additional regulations (for example OSHA) may apply including;

8 CCR 1529

8 CCR 1532.1

14 CCR Division 7

22 CCR Division 4.5

27 CCR Division 2

29 CFR 1910.120

29 CFR 1926.65

40 CFR 61

40 CFR 260 to 279

40 CFR 761

49 CFR 171 to 173, 179

Additionally, project specific work plans, standard operating procedures (SOPs), Health and Safety Plans (HASPs) have been developed for the work operations that will be monitored. The Task Manager should be familiar with these documents which at a minimum should include;

- The specific work plan for the MRA in which the field activity is being conducted. Typically a more specific work plan or project specification will have been developed for demolition, brush removal, or similar large scale heavy equipment activity. These activity specific work plans are often included as an appendix within the larger work plan.
- The MRA/site specific HASP.
- The soil management and erosion control plans for the specific MRA (if soil work is required).
- SOPs for the specific heavy equipment operation.
- SOPs for waste management (if required).
- SOP for the discovery of unanticipated chemical contamination.

3. PERSONNEL REQUIREMENTS

Only experienced personnel shall be used in performance of the work. All personnel shall have appropriate qualifications relevant to the type of work in which they will be engaged in accordance with to local, state, federal, or other regulatory requirements. At minimum personnel shall have 40-hour HAZWOPER training, munitions and explosives of concern (MEC) awareness training and biological awareness training. Personnel shall maintain medical clearance to work on the project and if necessary current respirator fit testing. Employee documentation shall be kept on-site for the duration of the project.

Personnel should be familiar with the hazards of working on a construction site and be vigilant for potential hazards at the Site.

Weston Solutions, Inc. (WESTON) personnel working on-site shall attend the safety briefing each morning.

3.1 PERSONAL PROTECTIVE EQUIPMENT (PPE)

WESTON\ personnel shall wear Level D PPE whenever they are on-site. Ear plugs should be available and should be used when working around heavy equipment, generators or other noisy equipment. Both nitrile and leather gloves should be available on-site to protect personnel from

chemical hazards and/or cuts and abrasions if working with soil, sharp objects or equipment. Respirators with P100 cartridges (HEPA, magenta) should be available on-site should dust levels exceed the Site specific action level. Long sleeve shirts are also recommended to minimize contact with poison oak and the sun.

3.2 WORK HOURS

Construction work hours are expected to be from 6 a.m. until 5:30 p.m. Monday through Friday. To the extent practicable air monitoring shall be collected for the maximum time possible each day which would allow the Task Manager to complete the Site tasks and meet laboratory submittal requirements (i.e. FedEx).

3.3 ON-SITE EQUIPMENT AND SUPPLIES

WESTON should have available the following equipment to complete the sampling shift:

- PDRs or other real time dust monitor with an appropriate number of 9-v batteries and zero bags (if dust monition);
- Field forms (daily report, air monitoring form, air sampling sheet (electronic ok), COCs)
- Sample labels
- Appropriate PPE
- Fire Extinguisher
- Shipping boxes/packing materials for samples
- Computer capable of downloading dust monitors and camera
- Personal air sampling pumps/cassettes (if collecting laboratory samples)
- Tools necessary for accessing air monitoring equipment and to collect samples (if necessary)
- Baggies or sample jars should unanticipated chemical contamination be discovered
- Caution tape to temporarily identify hazards
- Digital Camera

4. RESPONSIBILITIES AND CONTACTS

4.1 PROJECT MANAGER (PM)

The Project Manager for this work activity shall ensure work is in compliance with applicable work plans. The PM is not required to perform the on-site duties, but must insure its completion and be responsible for assuring that the work complies with regulatory documents.

4.2 TASK MANAGER

The Task Manger shall work under the direct supervision of the Project Manager. The Task Manager shall, at a minimum, perform or oversee the following functions during the project: contractor oversight; complete project communications; and as required direct the hazardous materials sampling (which may include air, soil or bulk sampling at the direction of the client), complete erosion control inspections, install fencing and signage or other as needed tasks as directed by the PM.

4.3 SITE SAFETY OFFICER (UXOSO)

The UXOSO ensures that all operations pertaining to MEC clearance are being conducted in a safe manner and in accordance with the Programmatic Work Plan, Site-Specific Work Plan, and associated SOPs. The UXOSO conducts safety daily safety briefings, audits of the operations and ensures that all personnel are properly trained and utilizing the appropriate personal protective equipment (PPE). The UXOSO has stop work authority.

4.4 SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SUXOS)

The purpose of the field activities is to support the cleanup of MEC, therefore the SUXOS is ultimately responsible for field operations at the Site and has stop work authority. Field activities should be coordinated with the SUXOS. The SUXOS is responsible for incorporating this SOP in plans, procedures, and training of field crews. The SUXOS is also responsible for notifying the Task Manager when suspect environmentally hazardous materials is encountered or when materials will require classification prior to disposal.

4.5 QUALIFIED BIOLOGISTS (QB)

QB's are responsible for ensuring that the conditions of the Camp Bonneville Habitat Management Plan are enforced on the CVFAW properties. A QB should be notified whenever a potential impact to habitat as described during the biological awareness training will occur. The QB has stop work authority if a condition of the Habitat Management Plan is being violated.

4.6 ASHTEAD TECHNOLOGY RENTALS

Ashtead is WESTON's preferred vendor for environmental equipment rental such as dust monitors, Photoionization Detectors (PIDs) or air sampling pumps. Ashtead may be reached at;

23575 Cabot Blvd, Suite 203
Hayward, California 94545
(800) 242-3910

5. SCOPE OF WORK

Short descriptions of the types of activities to be conducted are found below. Not all tasks may be completed each day and are dependent on the types of field activities that will be occurring.

5.1 TAILGATE SAFETY MEETING

All personnel should participate in the daily tailgate safety meeting conducted every workday morning prior to the start of field activities by the UXOSO at the field office. If the tailgate meeting is missed, or if additional personnel or visitors arrive on-site, they should stop at the field office in order to sign into the Site and receive a safety briefing.

5.2 CONTRACTOR OVERSIGHT

Contractor oversight consists of observing We WESTON's subcontractor's work to enforce the work plan and applicable specifications, ensuring compliance with pertinent regulations, and protecting the health and safety of workers and the general public. Daily monitoring forms and field notes shall be used to document detailed observations. Air samples, clearance inspections, dust monitoring and other tasks may be required during contractor oversight as described below.

The Task Manager is also responsible for issuing corrective actions for observed deficiencies to the contractor before, during, and after completion of the work. The Task Manager should note changes of conditions, verify quantities of materials for change order requests, document the individuals working on the contractor's crew, and observe waste handling procedures and dust control mechanisms (if necessary). In general the Task Manager acts as WESTON's eyes in the field and should ensure that identified work is conducted properly without creating an environmental or health and safety hazard and completed in a workman-like manner. At the completion of each shift the Task Manager should be able to describe the activities, issues, concerns, and resolutions to the PM so that progress can accurately be tracked.

5.3 AIR SAMPLING

Depending on the work activities multiple types of air sampling may be conducted at the Site. WESTON anticipates that 2 types of air monitoring may be conducted over the course of the project. These include dust monitoring using real-time particulate monitors, air sampling for lead during soil work.

5.3.1 Dust Monitoring

WESTON anticipates the majority of air monitoring will be conducted during substantive dust generating activities such as during brush cutting, or soil sifting. WESTON anticipates that 1 upwind and 2 downwind real-time aerosol monitors will be used in the general vicinity of these operations, generally at the edge of the exclusion zone or the property boundary. WESTON anticipates the primary dust monitoring instrument will be a pDR-1000AN. Dust monitoring should not occur during foggy conditions or during wet weather as dampness affects the instrument and these conditions act as natural dust suppressants. Specific instructions on the use of the PDR1000 are found below;

PDR Zeroing

Each day the PDRs should have new batteries installed (or be fully charged) and be zeroed inside the dust-free bag (z-bag). To zero the unit;

- Wipe the outside surfaces of the pDR-1000AN to remove as much dust from those surfaces as possible before placing the instrument inside the Z- bag.
- Turn on the unit.

- In a reasonably clean environment, open the zipper of the Z-bag and place the pDR-1000AN inside it. Close the zipper shut.
- Insert the fitting of the hand pump/inline filter unit into the Z-bag nipple.
- Press the "ENTER" key to start zeroing.
- Start pumping the hand-pump until the Z-bag begins to bulge.
- Slowly continue to pump to maintain positive pressure. PDR will take up to 2 minutes to zero.
- After completing the zeroing the unit should display "Calibration OK", open the Z- bag and remove the pDR-1000AN.
- Close the zipper, remove the pump and flatten the Z-bag in order to prevent dust contamination of the interior of the Z-Pouch.
- The pDR-1000AN is now zeroed and ready for measurement.

Daily Area Dust Monitoring

During significant dust generating activities dust monitoring should be conducted to ensure that dust control methods detailed in the work plan and/or project specifications are appropriate. WESTON anticipates that 1 upwind and 2 downwind monitors will be established on a typical day. At each of the three locations one PDR should be run in logging mode and positioned approximately 3 to 5 feet off the ground in a clearly visible location. Flagging may be used to ensure that the PDR is not inadvertently damaged by heavy equipment operation. Please ensure that brush and debris does not block the PDR's inlet.

To begin recording dust measurements using the PDR follow the following steps:

- Turn on unit and complete zeroing as described above;
- Press the "NEXT" button to enter READY MODE;
- "LOGGING DISABLED" will appear on the screen, press the "ENTER" button to enter the logging menu;
- "LOG INTRVL 60s, TAG #X" should appear. The unit is now logging a reading every 60 seconds and it is recording the data in a file called TAG #X;
- Press "NEXT" until you reach the main menu where "START RUN:ENTER; READY:NEXT" is displayed;
- This time press "ENTER" to start recording readings;
- "LOG INTRVL 60s, TAG #X" should be displayed and after a couple of seconds "CONC*0.000 mg/m3, TWA 0.000 mg/m3" should appear and the numbers should start

to change. The unit is now collecting dust readings. If a "*" is present after the "CONC" the unit is recording.

- Mount the PDR at a suitable location from 3-5 feet above the ground at one of the sampling stations and record the start time and unit location on the field forms.

5.3.2 Pump Calibration

Pumps and/or rotometers shall be calibrated against a primary standard at the WESTON Field office or laboratory prior to arriving at the job site and using a rotometer prior to and following each sample collection.

Daily Area Air Samples

Daily area air monitoring samples may be collected in the following areas.

- Outside the decontamination area (if used)
- Outside waste load-out areas (if used)
- Near critical barriers or potential problem areas accessible to the exterior
- Inside the work area as necessary
- At the output of each negative air machine (if used)
- At the edge of the exclusion zone

Clearance Sampling

PCM shall be utilized for all abatement clearance sampling and the clearance criteria shall be less than 0.01 fibers per cubic centimeter of air unless otherwise specified in the specifications for the project. The Task Manager shall sample in accordance with the numbers of samples specified by regulation or project specifications (whichever is more stringent). In general clearance air samples should be collected from each definable room.

All final clearance samples shall be collected under dry conditions using aggressive techniques. All barriers, except critical barriers, shall be removed for final clearance, unless the abatement area is not isolated from adjacent areas, or aggressive techniques are likely to contaminate adjacent areas. Project Manager approval is required in order to perform passive air clearance testing.

5.3.3 Lead Air Monitoring

During lead in soil remediation, lead stabilization or demolition the construction manager may elect to collect lead air samples to ensure that dust suppression techniques were appropriate to minimize the spread of lead dust outside the exclusion zone. Lead air samples shall have a target volume of 960 liters and sample collection should be using a personal air sampling pump. Samples should be collected an analyzed using National Institute for Occupational Safety and Health (NIOSH) Method 7082 (or equivalent).

Pump Calibration

Pumps and/or rotometers shall be calibrated against a primary standard at the LFR office or laboratory prior to arriving at the job site and using a rotometer prior to and following each sample collection.

Daily Area Air Samples

Daily area air monitoring samples may be collected in the following areas.

- Outside the decontamination area (if used)
- Inside the work area as necessary
- At the edge of the exclusion zone

Clearance air sampling is generally not conducted for lead work.

5.3.4 Adverse Weather

PDRs should now be used when it is raining or when fog is present. Laboratory air samples should not be used when rain is expected. Please record weather conditions on the field forms.

5.3.5 Laboratory Submittal

Unless otherwise directed, Daily Air samples may be submitted to the analytical laboratory under a 5-day laboratory turnaround time (TAT) on a weekly basis in order to save on travel and shipping costs. Submittal schedules and laboratory TAT for clearance air samples should be discussed with the construction manager and contractor prior to sample collection.

5.4 WEATHER AND DUST OBSERVATIONS

All appropriate control methods should be used to prevent dust from migrating offsite. These measures may include water trucks, wind rowing of dirt piles, covering soil piles, limiting construction traffic to a 15 mph speed limit, and stopping soil disturbance work when wind speeds exceed 25 mph. Please consult the soil management plan or appropriate work plan for detailed information on dust control measures at the Site.

Visible dust leaving the Site is a sufficient reason to implement more stringent dust control methods, even in the event that elevated PDR readings are not present. Please request additional wet methods or similar dust suppression techniques of the Contractor and/or inform the Construction Manager of the dust condition. Corrective actions conducted by the contractor should be detailed in the construction notes.

5.5 PERSONNEL SAMPLING

WESTON does not anticipate personnel exceeding applicable Action Levels or Permissible Exposure Levels if the Task Manager follows PPE and exclusion zone requirements. Additional information regarding exposure monitoring at the Site is found in the HASP.

5.6 CONTRACTOR OSHA COMPLIANCE MONITORING

The Contractor shall be responsible for compliance with Occupational Safety and Health Administration (OSHA) personnel air sampling or other sampling dictated in the specifications or work plan. The Task Manager shall not collect or analyze OSHA compliance samples for the Contractor unless approved in advance by the PM. However, if worker exposure data is collected by the Contractor, the Task Manager shall obtain and review the contractor's OSHA compliance monitoring, and reserves the right to perform concurrent personnel air sampling and to implement corrective actions as necessary. Copies of the Contractor's exposure monitoring (if conducted) should be obtained for the job file.

5.7 PROJECT COMMUNICATION

The Task Manager shall promptly report any significant problems including dust exceedances to the PM. Daily status updates should be communicated by telephone or in a summary email.

Copies of daily field notes, sampling forms, photographs and equipment downloads should be sent to the MEC Response and Removal Task Manager weekly.

5.8 PROFESSIONAL WORK PRODUCT

At all times on-site WESTON personnel shall conduct themselves in a professional manner and maintain the site in a workman-like manner. This includes keeping the Site neat, taking steps to prevent spills and cross contamination, observing proper work practices and maintaining clear and concise field notes and forms.

5.8.1 Project Records

Forms are required to be filled out daily. These include the air monitoring form, daily field notes, and a Chain of Custody (a single COC may contain multiple days of data) if necessary. Additional forms that should be available and may need to be filled out in specific instances include the Daily Tailgate Safety Meeting Form, an Incident Report Form, a Health and Safety Audit/Corrective Action Form and/or other forms deemed appropriate by the PM.

5.8.2 Completion of Field Notes

Field notes are intended to provide the "who, what, where and why" of the project. Notes should include the participants in the events, the time and date of events, describe observations and facts, and be clear enough for a third party to understand the day's events and why a certain plan of action was undertaken. Always remember that someone else will be reading your notes and consider the appropriateness of comments before writing down information. Minimum information that should be detailed in the field notes include:

- The time period WESTON is on-site and who is WESTON's representative
- Any training that is conducted (for example tailgate safety meetings)
- A list of contractors working on-site
- A list of visitors to the Site, for example regulators
- When, where and what type of sampling was conducted
- Where work is underway and a description of the work
- Weather conditions including prevailing winds and if visible dust is present
- Dust and hazardous materials control mechanisms in place

- Incidents, exceedances and accidents including a resolution/corrective action/or reason
- A description of any potentially hazardous waste that was generated and its disposition
- Work stoppages and why
- A general narrative of the work for the day and what is planned for tomorrow
- End of day TWA readings from the PDRs

Project field notes will become part of the project documents and are subject to review by the client and regulators. Corrections to notes should be conducted by crossing out the text with a single line and initialing the correction.

To the extent practicable never describe a deficiency or violation without also detailing the corrective actions you took to correct the deficiency. For example notes like:

"10:45 - Visible dust observed along the northern fence-line."

Should be followed with, "WESTON alerted Site Contractor to increase water usage, PDR readings at northern monitoring point at 0.011 mg/m^3, below the dust action level. Increased water usage has stopped the blowing dust." or something similar.

6. PROJECT ACTION LEVELS

The Action levels for this Site as described in the Work Plan, HASP and Soil Management Plan are:

	Action Level
Sustained dust by PDR (> 5 minutes sustained)	0.050 mg/m^3 (0.095 mg/m^3 stop work)
Lead	30 $\mu g/m^3$

7. REPORTING

A weekly report shall be prepared by the MEC Response and Removal Task Manager. The SUXOS, UXOSO and UXOQCS should provide the MEC Response and Removal Task Manager with copies of the field notes, forms, PDR data downloads, and any photographs each week.

7.1 PDR DOWNLOAD

In order to download information form the PDR you will need a computer with a serial port or an appropriate adapted as well as the PDR communications program. The steps to complete the download are as follows:

- Connect the communications cable to the PDR and the serial port (1 side looks like a phone jack the second side is the serial connector). Each PDR case should have the cable.
- Turn on the PDR and directly go into the Menu screens by pressing “NEXT” until “CONNECT TO PC” is displayed.
- Open the communications program on the computer and click “GET DATA”
- A list of files (Tags) should appear
- Click on the 1st file and download it
- Text should appear in the logger data screen
- When download is complete, click “save this data to a CSV file.
- Name the file with a date and an annotation to ID the PDR and save it to the computer. If it won’t save the file name is too long.
- Continue the steps until all the files have been downloaded.
- Verify the files are not corrupted by opening the files in excel.
- Resave the files as an excel spreadsheet; the file name can be longer/more descriptive.

7.2 WEEKLY REPORT DESCRIPTION

The weekly report should be reviewed and approved by a designated Project Manager/ MEC Response and Removal Task Manager prior to issuing the report to the client. The report shall include, at a minimum, the following information provided in an organized and complete manner.

- Scope of work for the week
- Changes, if any, to the scope of work or the project specifications made during the work.
- Daily field notes and checklists
- Air monitoring forms and PDR data
- Laboratory analysis results
- Documentation of compliance with pertinent regulations and specifications including a detailed discussion of any variances or non-compliance and corrective actions.
- A discussion of any health and safety training provided

- A description of visits from regulatory agencies
- Meteorological data
- Any other pertinent information deemed necessary by the MEC Response and Removal Task Manager

Final copies of the weekly report should be submitted to the client and the project file on TeamLink.

SOP - 6
DECONTAMINATION
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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1. SCOPE AND APPLICATION

All personnel or equipment involved in intrusive sampling or entering an area during intrusive sampling must be thoroughly decontaminated prior to sampling and prior to leaving the site to minimize the spread of contamination and prevent adverse health effects. This Standard Operating Procedure (SOP) describes the normal decontamination of sampling and site equipment. To minimize the possibility of cross contamination of samples (contamination of a sample by chemicals picked up at another area and transferred to an analytical sample by sampling or drilling equipment), proper decontamination procedures must be followed consistently.

Generally, solvents are used to remove organic compounds, such as volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs); nitric acid is used to remove residual metals; and detergent wash and/or steam cleaning are used to remove gross contamination and soil. All material and equipment should arrive intact and in clean condition. Recommended procedures for equipment decontamination during drilling test pit operations, sampling, and other field investigation procedures are described in the following sections.

2. EQUIPMENT

- Plastic sheeting, buckets, etc. to collect wash water and rinsates
- Approved potable water
- Deionized (DI) water
- Medical-grade isopropanol or equivalent
- Reagent grade 0.10N nitric acid
- Non-phosphate laboratory detergent (Liquinox)
- Aluminum foil or clean plastic sheeting
- Pressure spraying, rinse bottles, brushes
- Plastic garbage bags
- 0.01N hydrogen chloride (HCl)

3. RELATED PROCEDURES

- SOP Management of Investigation Derived Waste (IDW)

- SOP Soil Samples

4. PROCEDURE

4.1 SAMPLE BOTTLES

At the completion of each sampling activity, the exterior surfaces of the sample bottles must be decontaminated as follows:

- Be sure the bottle lids are on tight.
- Wipe the outside of the bottle with a paper towel to remove gross contamination.

4.2 SOIL SAMPLING EQUIPMENT

Sampling equipment that will be used includes materials such as stainless steel bowls, trowels, scoops, and split-spoons. Equipment to be used during sampling will be decontaminated at a centralized decontamination area site at which the equipment is being used. All sampling equipment will be decontaminated after use to prevent cross-contamination between sampling points. Decontaminated equipment will then be wrapped in aluminum foil with the shiny side facing out. No sampling debris will be left on any site.

The procedure for decontaminating sampling equipment is as follows:

- Place dirty equipment on a plastic ground sheet at the head of the decontamination line.
- Rinse equipment with potable water to remove surface dirt and mud if necessary.
- Scrub equipment with a bristle brush using a non-phosphate detergent (e.g., Liquinox) and potable water. To clean the inside of a bailer, use a bottlebrush pulled through the bailer with a polypropylene cord.
- Rinse off soap with potable water.
- Using a squirt bottle, rinse with 10% ultrapure nitric acid (use 1% nitric acid for metallic sampling materials) if equipment will be used for the collection of metals samples. Collect nitric acid rinsate in a tub or bucket.
- Rinse with American Society for Testing and Materials (ASTM) Type II reagent grade water.
- For equipment used to collect samples analyzed for organics, rinse with medical-grade isopropanol or equivalent. Collect solvent rinsate in a tub or bucket separate from the nitric acid rinsate.

- Rinse with ASTM Type II reagent grade water.
- Allow equipment to air dry.
- Wrap equipment with aluminum foil (shiny side facing out).
- Sampling equipment used to collect samples for organic analyses will not be allowed to contact any type of plastic after decontamination.
- Equipment that cannot be washed and rinsed (e.g., PID) should be covered with a plastic bag while sampling, with only the probe tip exposed.

At the end of the decontamination procedures, the proper disposal of the decontamination liquids will include the following steps:

- Discharge potable water in the decontamination area.
- Rinse soapy washtub in the decontamination area only.
- Dilute the detergent wash water and discharge it in the decontamination area.
- Overturn tubs to allow them to drain.
- Rinse tub bottoms and stack tubs for future use.
- The isopropanol, nitric acid, and DI rinse should be placed in a designated 55 gallon drum or other designated container for future characterization and disposal.

4.3 BACKHOE

If a backhoe is being used to excavate test pits in contaminated soil, or if analytical soil samples are to be collected from test pits, the following decontamination procedures should be followed:

- Prior to excavation of any test pit and between test pits, steam clean the backhoe bucket and arm using a non-phosphate detergent (i.e., Liquinox/potable water solution).
- Rinse the detergent solution from the backhoe bucket and arm by steam cleaning with potable water.

4.4 FIELD PARAMETER EQUIPMENT

- Water level indicators and transducers used for measurement of water in wells and in surface waters will be decontaminated after each use by flushing with ASTM Type II reagent grade water prior to and after each use. If floating product or high levels of organic contamination are evident, or known to exist in a well, the full sampling decontamination procedure outlined in Subsection 4.2 will be employed.
- Water quality instrument probes will be flushed with ASTM Type II reagent grade water between measurements. No solvents will be used to clean these probes.

- Turbidimeter sample vials will be wiped dry after being filled with a sample and prior to insertion into the turbidimeter. After the measurement is taken, the sample vial and the turbidimeter will be flushed with ASTM Type II reagent grade water.

4.5 SUBMERSIBLE PUMP

All submersible pumps used for sampling or for well development will be decontaminated after use to prevent cross-contamination between wells. The procedure for decontaminating submersible pumps is as follows:

- Scrub pump and cord in a tub of Liquinox and potable water.
- Pump (or recirculate) at least 20 gallons of the soapy water through the pump.
- Rinse with potable water.
- Pump (or recirculate) at least 20 gallons of rinse water through the pump.
- Rinse with DI water.
- Place pump in a decontaminated, plastic garbage can, or wrap it in clean plastic.

After decontamination, the proper disposal of the decontamination liquids includes the following steps:

- Drain wash water and rinse in decontamination area.
- Rinse decontamination containers with potable water.
- Allow containers to dry overnight.

5. PRECAUTIONS

- Dispose of all wash water, rinse water, rinsates, and other sampling wastes (e.g., tubing, plastic sheeting) in properly marked, sealable containers, or as directed.
- Once a piece of equipment has been decontaminated, be careful to keep it in such condition until needed.
- Follow the health and safety plan in regard to personal protective equipment (PPE), especially with regard to eye protection and gloves.

6. REFERENCES

ASTM Standard D5088. 2008. "Standard Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites." ASTM International, West Conshohocken, PA. 2008, DOI: 10.1520/D5088-02R08. www.astm.org. (Accessed 24 February 2010).

SOP - 7
ANALOG LOCATOR OPERATOR CHECKOUT
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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Attachment 1 Analog Locator Qualification Form

1. PURPOSE

This procedure outlines the requirements for analog locator operator checkout.

2. APPLICABILITY AND SCOPE

The Instrument Verification Strip (IVS) will be used as the analog locator checkout area. The IVS Plan identifies the number and type of items buried in the IVS. Each UXO Technician must successfully locate the required number of targets prior to commencing field data collection.

3. TEST OPERATIONS AND REPORTING

Prior to analog field operations, each UXO Technician will be certified in the established IVS. To achieve certification, each UXO Technician must demonstrate the ability to locate a minimum of 85 percent of target items. The Unexploded Ordnance Technician Analog Locator Qualification Form will be used to record the results of the test and will serve as a record of the individual's analog locator qualification.

Failure to locate 85 percent of the items will require a root cause analysis. After corrective action, UXO Technicians may be reprocessed through the test plot to demonstrate their ability to reach the required level of detection.

Upon successful completion of the test, certification of the UXO Technicians/equipment will be recorded by the UXOQCS on the Analog Locator Qualification Form and documented in the daily quality control report on the day that certification occurs.

Attachment 1
Analog Locator Qualification Form

Name:			**Position:**		**Team #:**	**Date:**
Item No.	**Target Located?**		**Analog Locator**		**Radial Error of Target Location (inches)**	**Comments**
	Yes	**No**	**SSI ML3**	**F3 UXO**		
Percentage located:			%	%		Pass/Fail
UXOQCS Name:			**Signature:**			**Date:**

SOP - 8
ANALOG LOCATOR OPERATIONS
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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Attachment 1 Field Supervisor Review Sheet
Attachment 2 Field Team Review Sheet
Attachment 3 Analog Locator Checklist and Return Procedure

1. PURPOSE

This procedure outlines the requirements for analog locator operations.

2. APPLICABILITY AND SCOPE

The analog locator will be used during the following operations:

- Analog Locator Daily QC Checkout
- Analog Surveys
- Near-Surface Anomaly Detection
- Backhoe Excavations
- Final 10% Analog Locator QC Surveys

3. OPERATIONS

Analog Locator Daily QC Checkout

The UXO Technicians will conduct a daily instrument standardization check by placing the instrument over a standard item prior to commencing daily field activities. The standard item will be buried with the item description, depth and orientation annotated on a wooden stake marking where the item is located. The standard item will remain in the same location until the block of grids has been completely investigated.

An Analog Locator Checkout and Return Form will be filled out daily by equipment operators to record the results of the analog locator QC checkout and document the condition of the equipment.

Analog Locator Surveys

Analog locator surveys will be performed in areas that cannot be surveyed using the digital techniques. Analog locator surveys are particularly effective in areas where vegetation and terrain limit the use of larger digital systems. The Analog locator survey approach will also be used in areas where metallic fragments and debris make digital discrimination from MEC ineffective.

UXO Technicians will use the procedure described in Section 4 of this SOP to conduct analog locator surveys. The location of any MEC items that are located using this method will be recorded with a GPS (or other survey method if under vegetation canopy) and all collected field data will be recorded in personal digital assistants (PDAs).

Near-Surface Anomaly Detection

Near-surface anomalies are those subsurface anomalies that can be excavated using hand tools. Throughout the excavation, the UXO Technician will use a magnetometer to check and verify the location of the anomaly.

Final 10% Analog Locator QC Surveys

Quality control surveys will be performed after intrusive operations have been completed. A 10 percent QC survey will be performed by the UXOQCS using the analog instrument for all grids originally surveyed using the analog locator. Failure criteria for any sub-grid will be any MEC or MD item found in a sub-grid or 5 or more non MEC/MD metal items that are greater than 2 square inches. Results of the 10 percent analog locator QC survey will be documented by the UXOQCS in the daily quality control (QC) report.

4. ANALOG LOCATOR SURVEY PROCEDURE

The following procedure will be used by equipment operators to conduct analog clearance operations with a handheld analog locator:

- Each UXO Team Leader will direct the UXO Technicians to establish individual search lanes that are suitable for the equipment and terrain. The search lanes will be optimized based on site conditions and lanes will be delineated with line, flags, marking paint and/or marking tape, and to begin searching each lane using a handheld analog locator.
- Each UXO Technician will start at one end of each lane and move forward toward the opposing baseline.
- During the forward movement, each UXO Technician will move the analog locator back and forth in a sweeping motion from one side of the lane to the other. Both forward movement and the swing of the analog locator are performed at a pace that ensures that the entire lane is searched and that the instrument is able to appropriately respond to subsurface anomalies.
- Whenever a subsurface anomaly or metallic surface object is encountered, the UXO Technician will halt and investigate the anomaly or place a flag for later investigation. Throughout this operation, the UXO Team Leader will closely monitor individual

performance to ensure these procedures are being performed with due diligence and attention to detail.

5. ANALOG LOCATOR QUALITY CONTROL REPORTS

The quality control reports and forms used to document the QC activities listed in this policy and procedure manual are as follows:

ATTACHMENT 1
FIELD SUPERVISOR REVIEW SHEET

I have read and understood the Project Work Plan and Standard Operating Procedure (SOP) UXO Technicians Analog Locator QC Checkout. To the best of my knowledge the processes described in the Work Plan and this SOP can be done in a safe, healthful, and environmentally sound manner. I have made sure all persons assigned to this process are qualified, have read and understand the requirements of the Work Plan and SOP, and have signed the Field Team Review Sheet for this process. If necessary, I will conduct an annual review of the Work Plan and SOP. If deviations from this SOP are necessary, I will ensure that project activities are stopped until the SOP is revised and approved. If unexpected safety, health, or environmental hazards are found, I will ensure that project activities are stopped until the hazards have been eliminated.

SUPERVISOR NAME	SIGNATURE	DATE

ATTACHMENT 2
FIELD TEAM REVIEW SHEET

Each field team member shall sign this section after reading the Project Work Plan and associated SOPs and receiving site-specific training before being permitted to work on-site.

I have read and understood the Project Work Plan and Standard Operating Procedure for UXO Technicians Analog Locator QC Checkout. I have received and understood the hazard control briefing. I will follow the Work Plan and SOP unless I identify a hazard not addressed in it or encounter an operation I do not understand. If that occurs, I will stop site activities and notify my immediate supervisor of the problem.

NAME	SIGNATURE/DATE	SUPERVISOR'S NAME	SIGNATURE/DATE

ATTACHMENT 3

WEEKLY ANALOG LOCATOR CHECKLIST AND RETURN PROCEDURE

FORMER CAMP BONNEVILLE MILITARY RESERVATION

MONTH/ YEAR: _____

INSTRUMENT: _____

SERIAL #:_____

ASSIGNED TO: _____

Day	Check for Damage	Check Battery Level	IVS Check	Clean Instrument	Comments
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					

SOP - 9
FIELD DOCUMENTATION
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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Attachment 1 Logbook Operating Practices

1. SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) describes procedures for proper field documentation. The field logbook serves as a permanent and traceable record of all field activities related to a project and will become a part of the project files. The information presented in this SOP focuses on the completion of field logbooks and/or field forms for documenting field activities conducted by Weston Solutions, Inc.

All data collection will be documented in either a bound field logbook or on appropriate field forms. Field logbooks will be assigned to individual field personnel for daily entries. Notes in the bound field logbooks will be made legibly, written in black or blue ink, and be as detailed and descriptive as possible so that a particular situation may be recalled without reliance on the collector's memory. No blank pages or sections of pages will be allowed. If a page is not completely filled in, a line will be drawn through the blank portion and initialed by the person keeping the log. There should be no erasure or deletions from the field notes. At the end of each day, the logbook will be signed and dated.

2. EQUIPMENT

Field logbooks

Field forms

3. RELATED PROCEDURES

None

4. PROCEDURES

4.1 FIELD LOGBOOK

The field logbook is the primary means of documenting field activities. It must be completed concurrent with field activities and present a thorough but concise summary of the activities conducted. The field logbook should enable the field activities to be reconstructed without relying on the field member's memory. Refer to the Logbook Operating Practices provided at the

end of this SOP for detailed descriptions of field logbook entry procedures. Logbooks should be kept in the field member's possession or in a secure place during field work. General provisions for field logbooks include:

- Project name/location and sequential logbook number should appear on the cover.
- Contact information should be recorded inside the front cover in case the logbook is misplaced.
- Write legibly and use a black or blue ink pen for all logbook entries.
- Corrections should be made by crossing out the data with a single strike mark, which will be initialed and dated by the person making the correction. Ensure that the original entry being struck out is still readable.
- Each page of the logbook should be sequentially numbered, dated, and signed by the field team member.
- Time should be recorded in military time (24-hour clock).
- For field sampling or data collection events documented in the logbook, entries should include but not be limited to:
  - Name of author, date, and time of entry.
  - Name, company/agency affiliation, and responsibility of field team members.
  - Names, titles, and arrival/departure times of any site visitors.
  - Weather (e.g., temperature, cloud cover, humidity, wind).
  - Health and safety briefings, personal protection equipment (PPE) level, or changes or issues encountered.
  - Calibration of field equipment.
  - Description of task.
  - Information concerning changes, scheduling modifications, and change orders.
  - Details of sampling locations and visual observations of matrix sampled (e.g., soil description, odors, discolorations).
  - Field observations.
  - Any field measurements made.
  - Decontamination procedures.
  - Documentation for investigation derived wastes (IDW) (e.g., contents and approximate volume of waste, disposal method).
  - Documentation of any scope of work changes required by field conditions.
  - Description of photographs taken.

- For oversight activities of consultants and contractors, entries should include, but not be limited to:
  - Name of author, date, and time of entry.
  - Name, company/agency affiliation, and responsibility of field team members.
  - Oversight location and task.
  - Names, titles, and arrival/departure times of any site visitors.
  - Weather (e.g., temperature, cloud cover, humidity, wind).
  - Arrival and departure times of oversight staff.
  - Observations of ongoing activities.
  - Compliance with or deviation from approved plans.
  - Description of photographs taken.

4.2 FIELD FORMS

Various field data collection forms may be used to streamline the documentation of field data. Field forms may also be customized for large data collection efforts. If field data are recorded on a field form, this data entry should be documented in the daily field logbook entry. Field form data entry should be executed with the same quality standards as field logbook data entry. Entries should be neatly written in black or blue ink and corrections made with single line strike-out and initials. Original field forms should be submitted daily to the Task Manager and be incorporated into the project file.

Examples of field forms that may be used for documenting field activities are summarized in the following sections and included in the Sample Forms section at the end of this SOP.

4.2.1 Positions requiring Log Books

Only the SUXOS, UXOQCS and UXOSO are required to keep daily logs in log books.

Attachment 1
Logbook Operating Practices

Procedure

- Logbooks are permanently bound, all pages numbered.
- Entries should begin on page 1.
- Use only blue or black ink (waterproof).
- Sign entries at the end of the day, or before someone else writes in the logbook.
- If a complete page is not used, draw a line diagonally across the blank portion of the page and initial and date the bottom line.
- If a line on the page is not completely filled, draw a horizontal line through the blank portion.
- Ensure that the logbook clearly shows the sequence of the day's events.
- Do not write in the margins or between written lines, and do not leave blank pages to fill in later.
- If an error is made, draw a single line through the error and initial it.
- Maintain control of the logbook and keep in a secure location.

General Information

- Date on every page.
- Team members and initials listed at beginning of day.
- Other personnel and affiliation (e.g. OSC-Smith, OSC-Jones).
- Written legibly.
- Signatures of author at bottom of every page.
- Signatures when change of recorder.
- Corrections are single lined and corrections are initialed.
- Team members' site entries and exits are documented.
- Chargeable off-site activities are documented.
- Note End of Logbook on last page ("End of Logbook").
- Late entries noted appropriately.

Field Logbooks

- General information.
- Name, location of site, and work order number.
- Name of the Site Manager or Field Team Leader.
- Names and responsibilities of all field team members using the logbook (or involved with activities for which entries are being made).
- Weather conditions.
- Objective narratives written.
- Field observations.
- Names of any site visitors, including entities that they represent.
-
- Summary of equipment preparation and decontamination procedures.
- Sample description including depth, color, texture, moisture content, and evidence of waste material or staining.
- Air monitoring (field screening) results.
- Types of laboratory analyses requested.

Photo Logs

- Camera and PDA (IDs).
- Grid or location of photo
- Date of pictures.
- Time of pictures.
- Directions of photos.
- Description of photos.
- Photographer/witness.

Safety

- All safety, accident, and/or incident reports.
- Real-time personnel air monitoring results, if applicable, or if not documented in the HASP.
- Heat/cold stress monitoring data, if applicable.
- Level of protection for tasks.
- Reasons for upgrades or downgrades in personal protective equipment.
- Health and safety inspections, checklists (drilling safety guide), meetings/briefings.
- Equipment make, model, and serial number for monitoring instruments
- Calibration records for monitoring instruments.
- Site safety meeting (time/topics).
- Site objectives/ plan of activities.
- Chemical/physical hazards.
- Personnel attending.
- Special personnel information (allergies, etc.).

Equipment

- Equipment type (make and model).
- Serial nos.
- Calibration records.
- Background readings and locations.
- Monitoring readings and locations.
- Sampler(s) initials.

Contractor Oversight Activities

- Progress and activities performed by contractors including operating times.
- Deviations of contractor activities with respect to project governing documents (i.e., specifications).
- Contractor sampling results and disposition of contingent soil materials/stockpiles.
- Excavation specifications and locations of contractor confirmation samples.
- General site housekeeping and safety issues by site contractors.
- Equipment and personnel on-site.
- Duration of equipment use vs. standby.
- Inventory of shipments received (or verification of items on packing slip).
- Document inspection of disposal trucks arriving at site (e.g., visual observation of clean tankers or truck trailers, etc.).

SOP - 10
OPERATIONAL USE OF THE EM61-MK2 TOWED-ARRAY
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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LIST OF PHOTOGRAPHS

Photograph 1 Four coil configuration of the EM61-MK2 Towed-Array

1. PURPOSE

This procedure outlines the technical requirements and operational use of the EM61-MK2 Towed-Array for use in geophysical surveys.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the EM61-MK2 Towed-Array. The instrument is utilized to collect transient electromagnetic signals form the subsurface up to a depth of four feet (unofficial estimate – dependent on size of target). The data generated from the multiple EM61-MK2 are collected concurrently with a navigational system (RTK-GPS) and stored on a field computer running MagLogNT software from Geometrics.

3. REFERENCES

EM61-MK2 Operating Manual, Geonics Limited.

MagLogNT operating manual, Geometrics Inc.

4. DEFINITIONS

4.1 EM61-MK2 TOWED-ARRAY COMPONENTS

The EM61-MK Towed-Array Components consist of a number of EM61-MK2 units dependent on particular array configuration:

- Bottom 1 m x 0.5 m coil
- Top 1 m x 0.5 m coil
- Electronic boxes
- Cables to connect electronic boxes with Bottom Coil
- Sync Cable
- Pig tail connectors to connect Bottom Coil to Top Coil
- Navigational mount
- Panasonic Toughbook with MagLogNT software

- Towed-Array pieces made of fiberglass and fiberglass nuts and bolts to assemble the array
- Tow vehicle – usually a Kubota Utility Vehicle

5. SET-UP AND OPERATION

This section outlines the steps for setting up the EM61-MK2 system in the field for data collection. Be sure to follow all operating manuals for set-up and operation.

1. Assemble Towed-Array components according to labeled pieces and color coding.
2. Assemble EM61-MK2s according to operating manuals and configure on the Towed-Array according to the specific project objectives (i.e. line spacing).
3. Interface the one of the EM61-MK2 with a navigational system and mount for precise location data.
4. Connect the main tow beam on the receiver hitch on the tow vehicle. Be sure to attach safety cabling from the tow beam to the back of the tow vehicle in case the hitch becomes dislodged during survey (it won't pull by the electronics cables it will pull by the safety cabling).
5. Connect all cables from the multiple EM61-MK2s along the main tow beam and into the back of the tow vehicle and connect to the electronics boxes in the appropriate interface. Be sure to enclose the cables in some protective covering and tape so everything is tight against the beam.
6. Connect the electronic boxes cables into an interface device (either a 4 port serial hub or PCMCIA adapter). Then connect the cable from the serial hub into the USB port on the field computer.
7. Set-up the MagLogNT software on the field computer. The most important thing is that the port settings are the set correctly. If using the serial hub the ports are usually 5, 6, 7, and 8. Set MagLogNT to interface with all the units according to their port assignments, be sure to make certain you know which EM61-MK2 unit is connected to which port. The same procedure is followed for setting up the GPS port assignment. See Photograph 1 for an example of one of the Towed Array configurations
   - Set the appropriate data collection rate (sampling rate, i.e. 10 Hz for MEC jobs).
8. Perform 10-15 minute warm-up of EM61-MK2 according to ambient temperature.
9. Perform Pre-survey QC (see separate QC SOP) which usually consists of a 2-3 minute Static Test (remain stationary with no object – record readings), Static Spike (remain stationary with a metallic object beneath coil – record readings), and Cable Vibration Test (remain stationary with no object moving cables – record readings). Note any spikes or abrupt changes in data.
10. Perform Latency Test
11. If all QC data is verified, collect data, according to operating manual.

Applicable References

Geonics, Ltd., 1996, www.geonics.com/em61.html.

Geonics, Ltd. 1999. *Operating Manual for EM61-MK2 61 High Sensitivity Metal Detector*.

McNeill, J.D. 1980. "Electromagnetic Terrain Conductivity Measurements at Low Induction Number." Technical Note TN-6, Geonics, Ltd., Mississauga, Ontario.

Plugge, D., R. J. Selfridge, and R. Young. 2003. *Planning Geophysical Prove outs for Munitions Response Projects*. Huntsville, Ala.: U.S. Army Engineering and Support Center.

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. Munitions Response Data Item Descriptions (DIDs). Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics.

Photograph 1: Four coil configuration of the EM61-MK2 Towed-Array

SOP - 11
COLLECTION OF GPS DATA COLLECTED BY A NON-RTK-GPS UNIT AND POST-PROCESSING OF GPS DATA PERFORMED USING TRIMBLE GPS PATHFINDER OFFICE SOFTWARE CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures applicable in the event that global positing system (GPS) data is collected using a non-RTK (real-time kinematic) GPS unit. This SOP also provides step-by-step procedures for the post-processing of GPS data collected using the Trimble GeoXH handheld unit and post-processed using Trimble GPS Pathfinder Office software. These procedures are to ensure that data collected in the field has best possible level of accuracy and is in correct spatial reference for project.

2. SCOPE

This SOP applies to all Weston Solutions, Inc. field personnel collecting GPS field data using a non-RTK-GPS unit and all Weston Solutions, Inc. personnel utilizing Trimble GPS Pathfinder Office software to post-process (differentially correct) Trimble GPS data for the project.

3. REFERENCE DOCUMENTS

Trimble, "GPS Pathfinder Office Software or the GPS Analyst Extension: Resolving the NAD 83 Datum Transformation Issue," 5 May 2005

Electronic Data Solutions, "GPS Data Not Lining Up with GIS Data," 26 October 2007

4. RESPONSIBILITIES

4.1 FIELD PERSONNEL

The field personnel collecting GPS data is responsible for identifying the spatial reference used to collect the GPS data and providing that information to the GIS Specialist. In addition, field personnel will ensure that a known monument location is acquired during data collection to allow for later QC check of data.

4.2 GIS SPECIALIST OR OFFICE STAFF

The GIS Specialist or other office staff are responsible for importing and post-processing the GPS data collected in the field and ensuring the data are in the correct spatial reference system for the project and do not show any signs of shifts, offsets, or other location errors.

5. OPERATIONS

5.1 FIELD DATA COLLECTION

1. In order to allow for a later check on the accuracy of data, an individual collecting GPS data will collect a reading at a known monument location following the creation of a new GPS data file or for each day of use. Either an U.S. Army Corps of Engineers monument or a National Geodetic Survey monument should be used as their locations are best documented and already available.

Weston Solutions, Inc. RTK control points may be used as reference locations as long as the control point number is documented in the included field notes.

2. When recording the monument location, field staff will enter some descriptive text or value (e.g. need monument ID and who installed as stamped on monument) to allow office staff to reference the monument's location documentation.

5.2 DIFFERENTIAL CORRECTION USING PATHFINDER OFFICE

This SOP assumes some previous knowledge of the Differential Correction Utility in Pathfinder Office.

1. In Pathfinder Office, run the Differential Correction Utility.
2. As you click through the Differential Correction Wizard, under the dialog that has inputs for Base Data, make sure the Base Provider Search radio button is selected and click on the Select button.
3. You will get the Select Base Provider dialog. Click on Update List, then select the nearest CORS station with the highest integrity index and click OK. It's best to select a station within 150 miles from where the data was collected.
4. Under Reference Position, select the "Use reference position from base files" radio button. Setting the Reference Position to "Use reference position from base files" when using a CORS reference station will adjust the GPS data from WGS84 (the datum in which it is collected in the GPS unit) to "NAD 1983 (CONUS) CORS96" in the differentially corrected output file.
5. Continue with the rest of Differential Correction Wizard as normal.

5.3 DISPLAY OF DIFFERENTIALLY CORRECTED DATA USING PATHFINDER OFFICE

When using Trimble Pathfinder Office to display GPS data corrected using the "Use reference position from base files" setting either for visual reference or for identifying feature coordinate values:

1. Under Options>Coordinate System, you should set the coordinate system to "US State Plane 1983 Washington Zone WA_S 4602, NAD 1983 (CONUS)."
2. Make sure that any background files you are using are set to "US State Plane 1983 Washington Zone WA_S 4602, NAD 1983 (CONUS)"-+ too. Background coordinate system settings are in File>Background.

   – Under the Load Background Files dialog, click on the respective files you are loading and verify that the system under "Coordinate system of selected file(s):" is set to "US State Plane 1983 Washington Zone WA_S 4602, NAD 1983 (CONUS)."If you set the coordinate system to CORS96, it will apply the datum shift for CORS96 a second time on the differentially corrected GPS data.

   – If the coordinate systems is not set to "US State Plane 1983 Washington Zone WA_S 4602, NAD 1983 (CONUS)," click Change and adjust the settings accordingly. Make sure that the linear unit is set to U.S. Survey Feet.

5.4 EXPORT OF DIFFERENTIALLY CORRECTED DATA TO ESRI SHAPEFILE FORMAT USING PATHFINDER OFFICE

If you are exporting the corrected file (.cor) to shapefile format, make sure to select "US State Plane 1983 Washington Zone WA_S 4602, NAD 1983 (CONUS)" under the Coordinate System tab, not 'CORS96.' If you set the output coordinate system to CORS96, you will apply the datum shift for CORS96 a second time.

The above directions only apply if you differentially correct a file using the "Use reference position from base files" setting AND the reference position is a CORS station. If you happen to use the 'Use reference position from base providers" setting instead, the .cor file output will always remain in WGS84, and you have to make several changes to your display and export to shapefile settings in order to have the output in the right place.

SOP - 12
ANOMALY REACQUISITION AND EXCAVATION PROCEDURE CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. PURPOSE

This procedure outlines the technical requirements and procedures for performing anomaly reacquisition and excavation of selected geophysical targets.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the excavation and investigation of selected geophysical targets.

3. REFERENCES

None

4. PROCEDURES

4.1 TARGET ANOMALY FLAGGING

- Upload of selected targets into navigational data logger as provided by the Geophysicist.
- Set up the real-time kinematic (RTK) global positioning system (GPS) in accordance with Weston Op.001.nav.rtk rev 1.
- Perform instrument checkout in accordance with Weston Solution, Inc. SOP 7. Analog Locator Operator Checkout.
- Proceed to Control Point (i.e., Bonneville 01) and verify the accuracy (offset less than 0.1 feet).
- Using the dig sheet information proceed to reacquire the anomaly targets identified marking each location with a non-metallic flag (or spray paint if flagging is not possible) bearing the unique target ID. (ie. CVF 012). Place the flag within 0.1 feet of the target coordinates as determined on the RTK.
- Once the target anomalies are flagged as described in Section 4.1, the Dig Team will begin anomaly excavation activities.

4.2 EXCAVATION OF TARGET ANOMALIES

- The Data Manger will upload the selected target anomalies onto the Personal Digital Assistant (PDA) (UXOFast program).
- The Dig Team will proceed to each flagged anomaly. One of the team members will bring up the Target ID on the UXOFast program to begin data collection.
- The Dig team will excavate each anomaly location flag or the spray painted location.

- The unexploded ordnance (UXO) Dig Team will use the appropriate hand held instrument, depending on the type of instrument used for the digital geophysical mapping survey (EM61-MK2 – Subsurface Instruments ML-3 and/or Minelabs F3UXO to investigate an area with a 3 feet radius around each flag to confirm the anomaly response. The UXO Team will note any offset from the flag to the excavated anomaly or anomalies and log accordingly.
- All anomalies will be identified and logged into the PDA running the UXOFast software.
  - Target characteristics logged include but are not limited to; Item type (munitions and explosives of concern (MEC), munitions debris (MD), cultural debris, QC item), item description (concrete, practice grenade), offset from flagged location, weight of item, depth, hole cleared, comments, etc. Once the data is entered, SAVE the entry.
  - If the target anomaly is a MEC item, the Dig Team will notify the Senior UXO Supervisor who will then determine the proper course of action.
- After logging an excavated item, the UXO Dig Team will continue to sweep the anomaly location for additional items and arrive at two possible situations:
  - If no further items are found within the radius of the flagged location, the hole is considered completed (cleared).
  - If different, additional items are found they are logged under the same target but given a different suffix (-1, -2, -3, etc) and logged as described above.
    - The Dig Team will proceed with excavation and removal of the anomalies to the depth required in order to clear the hole.
    - The Dig Team will remove all anomalies from the excavation hole. Anomalies will not be placed back into the hole even if they are not MEC-related.
    - If the hole cannot be cleared due to extensive debris or the presence of an in-place object (e.g., a pipeline), the hole will be logged as "Not Cleared" and the reason will be logged into the PDA and the Dig Team will inform the Senior UXO Supervisor of this finding. The hole may be investigated at a later time using heavy equipment such as a backhoe.
- The Dig Team shall handle all items recovered based on the type as specified in the work plan and explosive safety submission (ESS).
- The Dig Team will then spread the spoils/excavated dirt into a thin lift and check the material for the presence of metal debris using the appropriate analog locators. The excavation will not be backfilled until the spoils have been checked and verified not to contain MEC/MD or other metal debris.
- Once the spoils have been checked, the Dig Team will backfill the hole.
- If no anomalies are detected, the Dig Team will excavate a 14 inch deep hole directly below the flag and recheck the anomaly location using the appropriate analog locators. If no anomalies are still detected, the hole will be backfilled, the flag returned to its original location and the Team leader will log that target # as a "No Contact". No Contacts will be reviewed by the Geophysicist and checked as part of the QC-1 process.

4.3 COMMON QUESTIONS ENCOUNTERED DURING DIGGING PROCEDURES

- What if the UXO Techs come to a flag and their instrument response is outside the sweep radius?
  - The UXO tech will check to see if any additional flags are near the response they are detecting. If there is, that response is due to that other flagged location. If there are no additional flags then the Dig Team will log that item under the flag location in which they started and mark the offsets accordingly. The offset failure will be identified by the QC geophysicist and an examination of the geophysical data will be performed to identify the reason for the failure. The offset failure distance is anything outside 3 feet of the original flagged location. Note the target is only considered a failure if there are no items dug within three feet of the flagged location. If additional items are found outside the 3-foot radius they are not failures.

4.4 DOWNLOAD AND REVIEW OF DIG DATA

- Upon returning from the field the UXO techs will turn in all PDA's and the site geophysicist (or designated person) will "Send" all the logged data onto the SQL UXOFast server.
- The Site Geophysicist will review all the data for consistency and check the agreement with geophysical data (does the logged item "make sense" with the amplitude of the target) and make corrections based on clarification from the Team leader and/or the UXOQCS.
- The UXOQC Specialist and/or Senior UXO Supervisor will review any targets identified to be MEC or MD and review the entry information for consistency and accuracy.
- Upon completing the QC procedures the targets and findings will be made viewable to all parties via Teamlink.
- The following morning and prior to using the PDA's, the Geophysicist (or designated person) will "Get" all the tables for the PDA's in order to "Sync" all the units with the same information.

SOP - 13
GIS PROCEDURES
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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Figure 1 Grid Layout

1. PURPOSE

The purpose of this standard operating procedure (SOP) is to outline steps necessary to utilize the Project geographic information system (GIS).

2. SCOPE

This SOP applies to all personnel involved in performing mapping tasks in support of, or utilizing GIS data.

3. REFERENCES

USACE MMRP user manual

Data Item Description (DID) MMR – 005-07.01

EM 1110-1-1004

4. DEFINITIONS

FGDC—Federal Geographic Data Committee

NGS—National Geodetic Survey

ESRI—Environmental Systems Research Institute, Inc.

GIS—Geographic Information System

SDSFIE—Spatial Data Standards for Facilities, Infrastructure, and Environment. This is the Dept. of Defense standard for facilities, infrastructure, environment, and civil works.

USACE—U.S. Army Corps of Engineers. The current GIS contact is Cary Stiebel Cary.A.Stiebel@usace.army.mil

5. MAP AND DATA STANDARDS

5.1 GENERAL MAP REQUIREMENTS

There may be instances where design and layout guidelines may be bypassed in order to ensure that necessary information is conveyed for the purposes of a specific map document. However, Weston Solutions, Inc. (WESTON) Personnel will attempt to maintain consistent layouts and symbols on the project to allow for continuity throughout program.

5.1.1 Map Document Layout

Maps will be created in a variety of sizes (e.g., 8.5 x 11 inches [in.], 11 x 17 in., 22 x 34 in., 34 x 44 in., 36 x 36 in) depending upon the cartographic requirements and ease of readability in for presenting necessary data. Each sheet/set will utilize a standard layout template containing a size/type standard border, revision block, title block, complete index sheet layout (if set), scale bar, legend, north arrow, date, and path and name of the map document file (.mxd).

Template files (.mxt) will be established for use in ArcGIS and utilized to produce requested map documents for respective document sizes and orientations (landscape vs. portrait). A new map document generated using an existing map must have the elements of the source map incorporated into the project template layout.

MXD files exported to PDF will be named based on the ESCA RP Electronic File Naming Conventions (Year_month_date_MRA_title).

5.1.2 Symbols and Design Specifications

Standard symbols for regularly mapped features will be established and stored as ArcGIS Layer (.lyr) files for future use. These symbol sets will be used whenever possible to ensure the consistency and clarity of information presented throughout the course of the project and in multiple reports.

5.2 DATA STANDARDS

For any newly created project GIS dataset, a spatial reference will be defined and documented in the metadata. Master GIS files will be in State Plane Washington Zone WA_S 4602, NAD 1983,

in U.S. Survey meter units. Vertical references shall be North American Vertical Datum (NAVD) 1988, in U.S. Survey meter units.

5.2.1 Operating Grids

A grid system has been established by the Army for the Former camp Bonneville Military Reservation. The WESTON Team will utilize this grid system where applicable. These grids measure 500 feet by 500 feet. An example of this grid layout is shown on Figure 1.

5.2.2 Data Capture Methods

The WESTON Team will capture field data using a variety of methods which may include field notes, laboratory samples, photographs, or digitally using hand-held computers. The majority of information submitted to GIS will be collected by handheld computers or similar digital logging instruments (hereafter “units”).

Units selected for use in the field will be capable of collecting and downloading data to the appropriate database with minimal user assistance. This method of data capture will greatly reduce the number of potential errors that can occur during the transcription and data entry process. This method will also reduce the time between data capture in the field and inclusion in the database.

New GIS data may also be produced through the creation of digital geographic features based on hard-copy references (digitizing), or through the processing of existing geographic data, and the use of spatial analytical tools. The preferred format for newly created vector GIS datasets is as an ESRI geodatabase feature class. The preferred format for newly created raster spatial datasets is either TIFF for imagery (e.g. georeferenced hard-copy map) or ESRI GRID for raster data resulting from, or to be used as, input for raster GIS analytical tools.

GIS data derived from CADD source files must be converted into ESRI geodatabase feature classes in order to preserve true curves.

5.2.3 GIS Data Editing

Vector data will be created as ESRI geodatabase feature classes or as shapefiles if necessary. Vector data is to be created in a working or draft MRA geodatabase. This working geodatabase will be the container where intermediate processing feature classes are stored.

Once the desired, final feature class has been achieved, a QC review of the feature class contents and metadata should be performed. The feature class should then be incorporated with the master Project geodatabase. Any needed modification to a feature class found in the final Project geodatabase must be done by copying the feature class to the working geodatabase, performing edits there, documenting modifications, and incorporating the updated feature class back into the final Project geodatabase.

Shapefiles, coverages, and other vector GIS datasets should be converted into ESRI geodatabase feature classes in order to be incorporated with the master geodatabase. Raster datasets may be stored as ESRI GRID files or as TIFFs.

6. METADATA AND DOCUMENTATION

6.1 METADATA

Metadata is required for all feature classes within the “Data” geodatabase. Metadata for working files in the “Data WORKING FILES” geodatabase are required for any feature classes used as map document layers or source data. Full metadata is not necessary for intermediary files. An intermediary file is defined as a features class created as part of the geoprocessing procedure that is not to be the final data or will not be used within an existing map file, memo figure, or document map. Any feature class used as map document layers or source data that is produced by utilizing an intermediary file (e.g. a polygon feature class derived from a polyline feature class) must reference the source file(s) and the origins of the intermediary source file(s).

A backup of the default metadata template file is located in the GIS portion of the server. This template describes the field name, default value if present, notes on what type of information to enter and where within the ArcCatalog Metadata Editor this information shall be found and updated.

Metadata for each feature class is generated using the metadata editor in the ArcCatalog module. This software creates an .xml file, which will be available for viewing in ArcCatalog or in any web browser. The Federal Geographic Data Committee standard will be used as the framework for metadata formatting and any additional, project specific metadata elements will be identified. A template will be established containing minimum metadata items to be automatically applied to any new GIS dataset. Every dataset created will contain information regarding the data source, description of data contained and purpose, the date of relevance, and a description of the positional accuracy of the data.

FGDC metadata will be maintained for all final GIS data files and will be included with the data when it is distributed. Metadata will be developed as an additional report describing each of the spatial tables in the geospatial database that are received from the Army and any new data developed as part of WESTON action.

6.2 DOCUMENTATION

Project GIS documentation will consist at a minimum of a GIS project tracking document listing the pertinent information such as the date of creation, map title and author. This will enable subsequent users to identify and print the appropriate map when a map request is received.

Additionally, a document will be compiled containing a list of previously referenced maps used for the creation of existing GIS feature class, or as the basis for project map document files (.mxd).

7. ROLES AND RESPONSIBILITIES

7.1 GIS PROJECT SPECIALIST

The number of GIS Project Specialists required by the project may vary with workload, with a minimum of one WESTON GIS Project Specialist on staff. Auxiliary GIS Specialists will be available if necessary.

The WESTON GIS Project Specialist is responsible for high-level management of the overall GIS and database program, development of the database structure and applications, and performs the day-to-day GIS tasks for the project. The WESTON GIS Project Specialist will have a broad

knowledge of GIS applications, capabilities, and overall system requirements along with specific hands-on experience using the supplemental GIS software.

Specific duties include the day-to-day management responsibilities of GIS projects and integration with the database. The GIS Project Specialist coordinates project GIS needs with the Project Manager (PM), the MEC Response and Removal Task Manager (RRTM), Geophysicists, and their project staff as necessary. WESTON GIS Specialists will be responsible for creating and modifying GIS data layers to create maps for field use, presentations, and final reports.

7.2 GIS USERS

Only the project GIS Project Specialist and Auxiliary GIS Specialist(s) will be given permissions within the database to ensure only authorized personnel can make changes to database values. Read-only permissions will be assigned to users who need to review data, but who are not authorized to make changes.

Users are responsible for providing the Project GIS Specialist with verifiable field data and appropriate metadata (as necessary). Should a user identify a discrepancy between field data and GIS and/or database information, the discrepancy should be brought to the attention of the GIS Project Specialist for resolution.

7.3 GEOPHYSICIST

The Project Geophysicist will coordinate with the Project GIS Specialist to facilitate the transfer of data collected by WESTON during MEC removal activities. The Project Geophysicist is responsible for providing the Project GIS Specialist with verifiable field data and appropriate metadata. Should a discrepancy between field data and GIS and/or database information be discovered, the discrepancy should be brought to the attention of the Project GIS Specialist for resolution.

7.4 PROJECT MANGER

The Program Manager is responsible for dissimilating and ensuring the implementation of this SOP.

8. QUALITY CONTROL (QC)

WESTON will perform QC of data received from the field and presented for analysis or in reports to regulatory agencies. The QC process will include checks and reviews of the digital data deliverables. Procedures used for QC of GIS data will be documented.

The Project GIS Specialist will oversee spatial accuracy of new GIS data, which will be checked against known locations using existing survey data, digital orthophotography, or other appropriate references. Additionally, a comparison of the ArcCatalog metadata and the contents of the GIS data file will be made to ensure that the metadata are correct.

The Project GIS Specialist will be responsible for performing and documenting database QC. QC will include checks for feature completeness, accuracy, attribute value consistency, and value precision. A history of review and correction will be preserved. It should be noted that these are the fundamental QC steps for information management, and that individual project sites and scopes may specify additional QC requirements.

QC checks will be applied to each step of data processing. The QC checks will facilitate in ensuring that operations data is entered and transferred between team members and stakeholders properly. If at any point during this process the data is found to be deficient, WESTON will take the appropriate corrective actions regarding the data in question.

Automated checking procedures and other timesaving/quality assuring measures may be developed throughout the course of this program.

9. DATA ARCHIVING, BACKUP, RECOVERY AND SECURITY

All GIS data, map files, metadata, and user manuals will be stored on the main server, located in West Chester, PA with a backup system and an uninterruptible power supply (UPS) to ensure maximum data integrity. Database backup routines will be established by the WESTON Information Technologies Group (IT) in accordance with company data retention policies. These routines will be set up for daily and weekly backups. These backups will be used to restore data to the database in the event of database corruption or other events requiring restoration of the data. The Project GIS Specialist will coordinate with WESTON IT to ensure backups are taking

place properly and to restore data if needed. A log of database backups will be generated and maintained by IT.

10. SURVEYING AND GPS

10.1 SURVEY MONUMENTS AND REFERENCE LOCATIONS

All work on the site is based on established monuments, satellite-based RTK-GPS, and/or post-processing using established base stations of GPS-surveyed coordinates. The coordinate system to be used for control points and other survey activities is US State Plane 1983 Washington Zone WA_S 4602, NAD 1983, U.S. survey meters. Survey Monuments to be installed shall meet the standards established by the Federal Geodetic Control Committee (FGCC) for Third Order, Class 1 survey and published in the publication "Classification, Standards of Accuracy and General Specifications of Geodetic Control Surveys" (September 1984) and "Specifications to Support Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys" (1980). Monument locations shall be stored in the WESTON GIS spatial database in order to be available for mapping applications.

Any caps developed for new monuments installed by the RP Team will be stamped in consecutive order and show Clark County as the installer. The name and identification to be stamped on each cap will be recorded. The following is an example of consecutive monument cap identification:

CBMR-1-2012	CBMR-2-2012	CBMR-3-2012
CLARK	CLARK	CLARK

The dies for stamping the numeric and alphabetic figures into the caps shall be 1/8-inch to 3/16-inch in size. All coordinates and elevations shall be depicted to the nearest one-thousandth of a meter (0.001 m) and one-hundredth of a foot (0.01 ft).

10.2 MAPPING OF CONTROL AND REFERENCE POINTS

The location, identification, coordinates, and elevations of all control points recovered and/or established at the corners of areas cleared of MEC will be incorporated into the electronic spatial database for use on any relevant site map. Any surveyed coordinates will be recorded and a

database of all points will be provided by the surveyor to the Project GIS Specialist at the completion of survey activities.

10.3 STAKING AND RECORDING OF LOCATIONS

The Survey Stakes used to identify grid systems, grid nodes, building buffers, parcels, and boundaries between survey monuments shall be durable and re-locatable by field crews. Preferred staking methodology would include a nail set at each stake location which should NOT project above grade and include a wooden lathe stake inserted in the ground, adjacent to the nail to act as the visible marker.

Staking for the boundaries of Wetland areas shall be painted and shall be uniquely identifiable from a distance.

Throughout the course of the project, it is anticipated that the location of other items or features, such as roads, firebreaks, fences, power lines, etc., will need to be determined. The location of these items will be acquired with RTK-GPS technology where possible, and with standard surveying procedures where terrain and/or vegetation preclude such acquisition. In the event of MEC removal activities along firebreaks or roads, clearance grids will be designed and located using the above-mentioned survey methods.

Lower accuracy GPS methods, including systems that have sub-meter accuracy (with decimeter accuracy after post-processing) may also be used when less precise measurements are required or at locations where GPS signals cannot be reliably received. Instances where these systems may be used include performing biological field surveys, informal field visits, documenting large features, or other similar non-MEC investigative or remedial activities.

10.4 EQUIPMENT

Equipment used in surveying activities on the project will include, but not be limited to, RTK-GPS base station and rover(s), mapping grade GPS rovers, and total station surveys. The survey equipment to be used will be at the discretion of the surveyor so long as survey results meet the standards established by the Federal Geodetic Control Committee (FGCC) for Third Order, Class 1 survey and published in the publication “Classification, Standards of Accuracy and General

Specifications of Geodetic Control Surveys" (September 1984) and "Specifications to Support Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys" (1980).

10.5 SURVEYOR QUALITY CONTROL

The Project GIS Specialist and Project Geophysicist will be responsible for QC and validation of survey data received. Survey data received from the field will be checked against existing surveys for accuracy and completeness at least weekly. The data will also be checked to ensure that labeling is correct and follows the project standard set for the features surveyed. All survey data (excluding geophysical data collection) will be stored in a geospatial database with proper data validation metadata.

1. Vertical and horizontal survey data tolerances shall meet the standards established by the Federal Geodetic Control Committee (FGCC) for Third Order, Class 1 survey and published in the publication "Classification, Standards of Accuracy and General Specifications of Geodetic Control Surveys" (September 1984) and "Specifications to Support Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys" (1980). Survey data shall include a discrete survey point identification number, along with horizontal and vertical coordinates.
2. Surface contour plans where required shall show contours at minimum 2-foot intervals in all areas, and shall show each measurement location and corresponding elevation.
3. Format of survey information and drawings shall be suitable for use in determining earthwork quantities electronically and without further manipulation, and shall be subject to approval. Software used to prepare drawings shall be fully compatible with program software (if CAD, AutoCAD version 2004 or later; if GIS, ArcGIS 9.0 or later).
4. For each CADD file submitted, surveyor shall provide a text file containing descriptions of the purpose of the file, descriptions of respective layers, line weights, symbols, referencing of files, etc.

11. GPS USAGE

Any data collected via GPS should contain information providing the name, type, or model of the unit used for data acquisition. GPS data provided for mapping or incorporation into the GIS should indicate if post-processing (differential correction) was performed on the dataset. In addition, information should accompany the dataset indicating the average position error reported by the GPS unit during the time of data collection. GPS data collected using a non-RTK-GPS unit will require post-processing using Trimble GPS Pathfinder Office software.

To ensure that data collected in the field has best possible level of accuracy and is in correct spatial reference for project, personnel collecting data using a non-RTK-GPS unit should follow the SOP for Collection and Post-Processing of GPS Data Collected by a non-RTK Unit.

Whenever creating a new GPS data file, an individual collecting GPS data will collect a reading at a known monument location (such as an NGS monument) in order to allow for a later check on the accuracy of data.

12. DATA FLOW

12.1 WESTON DATA ACCESS

Geographic data is required for the purposes of archiving, reference, document production, and program management. In particular, data needed for document production and program oversight should be available on an ongoing basis with as short a lag as possible between when the data is collected and when it is accessible to team members for review and QC.

12.2 DATA DISTRIBUTION

Updates made to the database will be provided to Clark County as requested. Updates to these files received from Clark County will be incorporated into the project GIS upon receipt. Data transfer between WESTON, Clark County, and the Stock holders will be accomplished electronically, with the method dependent upon the size and format of the data.

Clark County has requested that WESTON provide final MEC and MD finds, geophysical operations, and MEC demolition activity data. WESTON and Clark County are working together to identify the data needs to be provided in the agreed upon format. Data transfer from WESTON to Clark County will occur following the release of the associated final report for the area in which the data was recorded.

12.3 INTERNAL REMOTE ACCESS AND EDITING OF GIS DATA

To ensure data integrity, the ability to modify project GIS databases will be restricted to the Project GIS Specialist or the auxiliary GIS Specialist (if required). Separate locations on the WESTON server will be established with read and write privileges for remote GIS Specialists

assisting with the mapping. This folder will contain a copy of the most recent working geodatabase schema. Any feature classes needing modification will be copied from the working geodatabase to the working copy to be used by the remote GIS Specialist. Edits may then be performed and new files created within the server location, including any new or revised MXD files created by auxiliary GIS Specialists. Any modifications or new file creation should be documented by the auxiliary GIS Specialist and as a text or Word file, and this information provided with the modified or updated files.

The on-site GIS Project Specialist will integrate any modified or newly created files into the primary Project GIS datasets upon his/her return.

13. DATA STRUCTURE AND FILE TYPES

13.1 STRUCTURE AND DESIGN

GIS vector data for the project will be stored in a geodatabase. Additional data will be stored in SQL Server 2005. Raster files such as orthophotography and geophysical pseudocolor maps will be stored as TIFF (.tif) files with .tfw world files defining the geospatial location and resolution of the image. Raster data generated as the result of the use of raster analytical tools will be stored as ESRI GRID files.

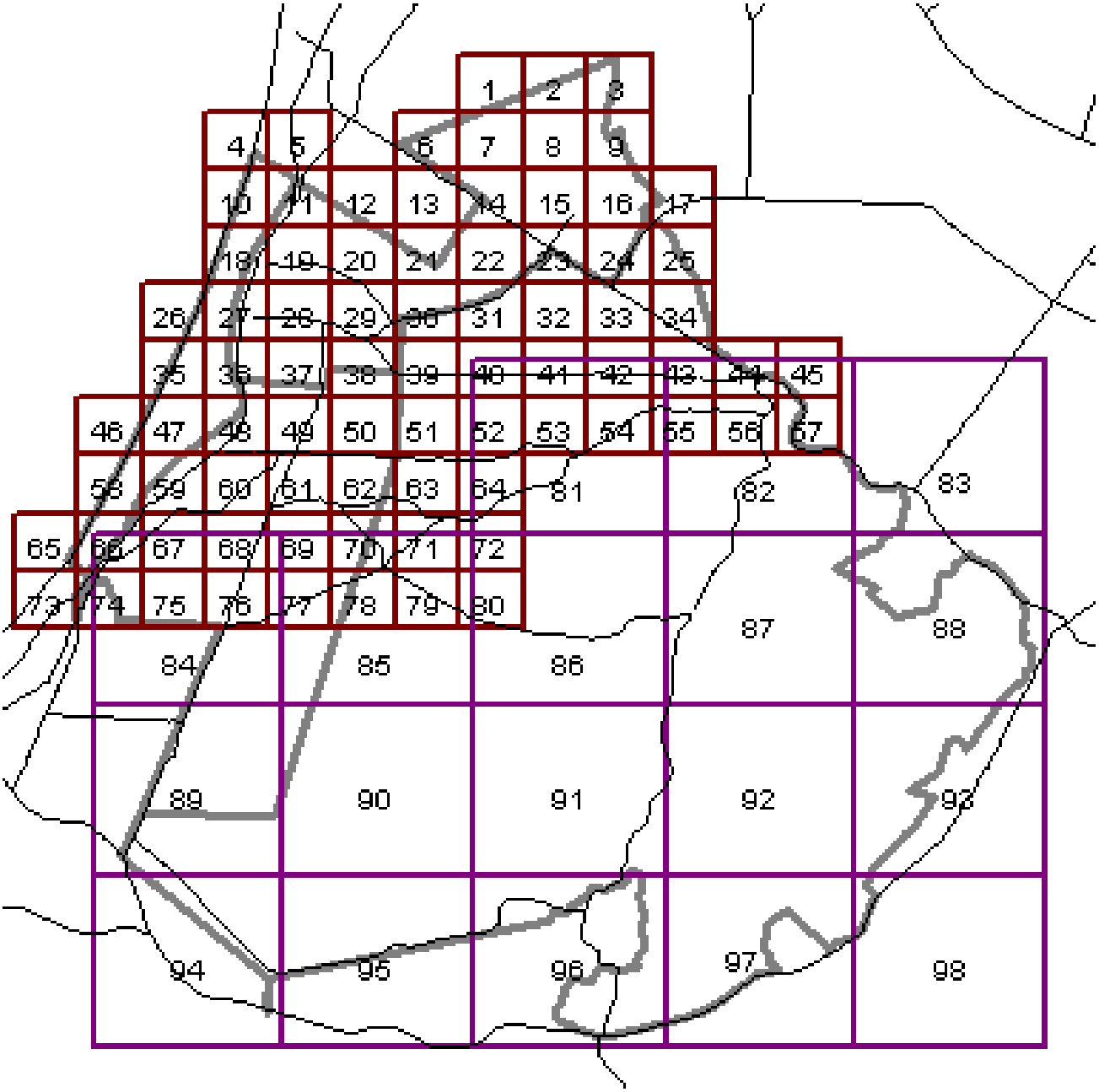
The structure and design of the database will be accomplished in coordination with Army personnel, if necessary. Some databases in use on the project include;

- Read-only database that can be spatially enabled for records containing coordinate values.
- Camp Bonneville geodatabase (from Clark County). Read-only geodatabase containing spatial data collected and maintained by the County. Will serve as a source for the base map geodatabase.
- Base Map geodatabase (from WESTON). This geodatabase will contain feature classes not related to MEC removal operations or habitat monitoring. It will follow the USACE, SDSFIE database structure.
- Operations geodatabase (from WESTON). This geodatabase will contain feature classes related to MEC removal operations, habitat monitoring, and other field activities. Feature classes organized by area.
- Historic Data (SEDR) geodatabase (from Clark County). This geodatabase will contain copies of all GIS datasets used for the CAP. Feature classes will be organized by MRA.

13.2 GEOPHYSICAL DATA

The information management team will design a geophysical database for tracking fieldwork and reporting data. This will be designed in cooperation with the Project Geophysicist to meet overall program and site-specific geophysical objectives such as reporting survey team information, anomaly picks, dig sheet production, geophysical file index, and project analysis. The database will be designed with forms for categories such as geophysical processing data. Reports and analysis will be created with queries that allow users to access and analyze data from multiple tables and multiple records.

Figure 1
Grid Layout



SOP - 14
BACKHOE OPERATIONS
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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1. BACKGROUND

Backhoes may be used at the former Camp Bonneville to excavate during investigation of subsurface magnetic anomalies.

2. SCOPE

This standard operating procedure (SOP) contains information specific to the former Camp Bonneville. It is incumbent upon all designated operators to familiarize themselves with this SOP, and to periodically review them in an effort to remain current with safe, productive backhoe procedures.

3. OPERATIONS

Employees who operate backhoes on the former Camp Bonneville will be qualified through on-the-job training (OJT) consisting of equivalent OJT that was documented through previous employment or experience, or documented through formal training. When engaged in backhoe operations the operator will perform daily inspection and maintenance functions and operate the backhoe as directed. Inspections will be documented using the Weston Solutions, Inc. Equipment Inspection Form or forms from the Operation's Manual. The operator will also conduct OJT for other operators at the team leader's discretion.

3.1 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Modified Level D PPE will be required for personnel engaged in backhoe operations. Clothing items will be:

- Coveralls or work clothing as prescribed
- Work gloves, leather, canvas or rubberized, as appropriate
- Safety glasses - as wind conditions and airborne particulate matter dictate
- Hard hats
- High Visibility Vest
- Work boots (sturdy and of sufficient height to aid in ankle support)
- Hearing protection: noise attenuating helmet or earplugs will be worn by anyone within 25 feet of the backhoe while it is operating; FLD 01 will be followed and hearing

protection for any other backhoe brought on site will be determined through a noise survey (sound-level meter survey)

- Dust masks - as wind conditions and airborne particulate matter dictate

NOTE: If the backhoe is being used for the clearance of rat nests to facilitate a magnetometer sweep, PPE will be in accordance with the Hantavirus SOP.

3.2 GENERAL SAFETY PRECAUTIONS

Maintain minimum separation distances as identified in the appropriate work plans.

The backhoe will not be operated without a spotter. This includes using the front and rear attachments and backing the tractor. No personnel are allowed within the extent of swing radius of the boom, known as the safety arc, during excavation operations. Prior to anyone entering the safety arc, the operators will:

- Swing the boom arm fully to one side
- Lower the bucket to the ground
- Return the engine to idle speed
- Hold her/his hands clear of the controls or in the "hands up" position

3.2.1 Equipment Safety Precautions

See the operator's manual.

3.3 TEAM COMPOSITION

One UXO Technician will serve as a safety observer and director for other team personnel and all members of the backhoe team will be UXO qualified. The minimum team makeup will be:

- One operator
- One safety spotter

3.3.1 Ground Personnel

Team members working on a backhoe team will perform such tasks as magnetometer checks, manual excavation, and checks of the excavated hole and soil spoils.

3.4 TRAINING

Training will be documented in SUXOS field notebooks and in Weston Solutions, Inc. on-site records.

3.5 GENERAL OPERATIONAL PROCEDURES

The operator will have a radio to monitor radio transmissions while operating the backhoe. Prior to excavation operations the UXO Team Leader will review established hand signals with all members of the team. The backhoe will not be used to excavate closer than 12 inches from MEC in accordance with EP-385-1-95A, Section 14, Paragraph b. Removed dirt will be placed at least 2 feet from the expected edge of the excavation, and on the uphill side when working on a slope. Excavations will not be deeper than 14 inches without authorization from the Project Manager, and will not be deeper than 4 feet without authorization from the UXO Safety Officer. Such excavations require a competent person as defined by 29 CFR 1926.651-653 to determine step/slope requirements.

SOP - 15
SOIL SIFTING
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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ABBREVIATIONS AND ACRONYMS

Army	U.S. Department of the Army
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
ESS	Explosive Safety Submission
FFE	free from explosives
MD	munitions debris
MEC	munitions and explosives of concern
MRA	Munitions Response Area
MRS	Munitions Response Site
OSHA	Occupational Safety and Health Administration
PM	Program Manager
PPE	personal protective equipment
QA	quality assurance
QC	quality control
SOP	standard operating procedure
SUXOS	Senior Unexploded Ordnance Supervisor
UXO	unexploded ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
WESTON	Weston Solutions, Inc.

1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of sifting operations at the Former Camp Bonneville Military Reservation.

2. SCOPE

Personnel performing sifting operations shall conform to this SOP.

3. REGULATORY REFERENCES

Occupational Safety and Health Administration (OSHA) General Industry Standards, 29 CFR 1910

OSHA Construction Standards, 29 CFR 1926

Unites States Army Corps of Engineers Engineering Manual 385-1-1, Safety and Health Requirements Manual

4. RESPONSIBILITIES

4.1 PROGRAM MANAGER

The Project Manager (PM) is responsible for ensuring availability of resources to safely and effectively implement this SOP.

4.2 SENIOR UXO SUPERVISOR

The Senior Unexploded Ordnance Supervisor (SUXOS) is responsible for incorporating this SOP in plans, procedures, and training, and ensuring compliance during field operations.

The SUXOS is jointly responsible for certifying that material is free from explosives (FFE) along with the Unexploded Ordnance Quality Control Specialist (UXOQCS).

4.3 UXO SAFETY OFFICER

The Unexploded Ordnance Safety Officer (UXOSO) ensures that sifting operations are conducted in a safe manner, in accordance with the CVFAW Work Plan, this SOP, and applicable regulatory guidance.

4.4 UXO QUALITY CONTROL SPECIALIST

The UXOQCS ensures that quality control inspections are performed and documented in accordance with the Work Plan and this SOP. Deficiencies will be reported to the PM, Task Manager, SUXOS, and UXOSO. The UXOQCS will verify that appropriate corrective measures are taken and documented. The UXOQCS will inspect munitions debris (MD) and non-munitions and explosives of concern scrap prior to disposal or recycling, and will sign off on Daily Quality Control (QC) Inspection Reports.

The UXOQCS is jointly responsible for verifying that material is FFE with the SUXOS.

4.5 UXO TECHNICIAN

The UXO Technician provides munitions and explosives of concern (MEC) support and is familiar with the equipment being utilized. The UXO Technician shall perform tasks to include a visual search/survey of the area(s) of operation and inspection of soil being loaded into the sifter and the spoils and finds resulting from sifting.

4.6 EQUIPMENT OPERATOR

The Equipment Operator will be qualified and fully trained on the equipment being utilized and shall operate the equipment as directed. The Equipment Operator shall perform daily inspections and maintenance functions as required by the operator's manual(s) and shall perform other duties as needed or directed.

5. OPERATIONS

There will be a minimum of two UXO Technicians (UXO Tech II or equivalent) on site during active sifting operations. The UXO Technicians will conduct an overall visual survey of the area prior to starting operations.

The excavated soil screening process will be as follows:

1. The excavated material will be introduced into the sifter with. Material will be 100% inspected by trained UXO personnel as described in Section 8.1 of this SOP and subsequently sorted into three material types:
   - Material 1A – Rock, asphalt, or concrete. This material will be classified and disposed of/reused as approved by the regulatory agencies.
   - Material 1B – Oversized material (e.g., very large items, lumber, rubber, wire, etc.) will be sorted. This material will be classified and disposed of/reused as approved by the regulatory agencies.
   - Material 1C – Ferrous material will be segregated into:
     - MEC, which will be handled according to established handling procedures, and
     - Non-MEC material (including MD)

The current approved exclusion zones are described in the ESS.

6. SAFETY

Appropriate precautions will be observed during sifting operations. The precautions listed below are general in nature and applicable equipment and operational publications will be reviewed periodically:

- Conduct tailgate safety briefings daily, when the operation changes, or when there is a change of personnel
- Maintain 200 feet from other essential operations
- Maintain appropriate distance for nonessential personnel as provided in the ESS in Appendix I of the work plan
- Use equipment safety features (i.e., seat belts, fire extinguishing equipment)
- Observe applicable safety precautions in operator's manual
- Maintain communications between personnel involved in the operation
- Maintain site control
- Observe MEC precautions for items encountered
- Ensure personal protective equipment (PPE) is serviceable and properly in use
- Water will be used for dust mitigation on a case-by-case basis as deemed necessary by the UXOSO

An activity hazard analysis and equipment safety checklist providing additional details about the tasks, potential hazards, control measures, and PPE requirements is provided in The Accident Prevention Plan located in Appendix D.

7. PERSONAL PROTECTIVE EQUIPMENT

Level D PPE will be required during mechanical sifting operations. Clothing will include, but not be limited to:

- Coveralls or work clothing as prescribed
- Work gloves, leather or canvas as appropriate
- Safety glasses
- High Visibility vests
- Hard hats, if necessary (not when inspecting MPPEH items)
- Hearing protection, noise attenuators, or ear plugs when within hazardous decibel range of equipment

8. QUALITY CONTROL AND QUALITY ASSURANCE ACTIVITIES

As described above, the process of screening the excavated material will generate the following types of materials:

- Material 1A – Rock, asphalt, or concrete. This material will be classified and disposed of/reused as approved by the regulatory agencies.
- Material 1B – Oversized material (e.g., very large items, lumber, rubber, wire, etc.) will be sorted. This material will be classified and disposed of/reused as approved by the regulatory agencies.
- Material 1C – Ferrous material will be segregated into:
  - MEC, which will be handled according to established handling procedures, and
  - Non-MEC material (including MD)

8.1 MATERIAL TYPES 1A AND 1B

UXO personnel will conduct a visual inspection of Material Types 1A and 1B. The purpose of this inspection is to verify that reject materials are properly sorted, segregated, and secured depending on material type.

At the end of the day (or more frequently as deemed necessary), each type of material will be placed at a staging area. The staging area will be positioned to maintain a minimum 200-foot team separation distance from the sifting operation or any other MEC operations. UXO personnel will then inspect 100% of each material type. MEC, MD, or non-MEC-related debris will be segregated and managed in accordance with the established handling procedures. The various material types will be inspected as determined by the SUXOS. MEC or MD items recovered will be sorted appropriately.

As part of the QC process, the UXOQC personnel will conduct an inspection at a minimum of once per day of each of the material types. The purpose of this inspection is to verify that the UXO personnel are properly sorting the material. If an item is determined to be improperly sorted and/or a MEC item is missed, a root cause analysis will be conducted to determine why this occurred and a corrective action will be implemented. Failures and corrective actions will be documented.

8.2 SIFTING OPERATIONS QUALITY ASSURANCE

The Clark County Munitions Safety Officer will provide oversight of MEC-related activities associated with this work, including the soil sifting operations. This QA activity is in addition to, and is independent of, Weston's QC activities described above in Sections 8.1. As noted in the Quality Assurance Project Plan, the QA personnel will perform periodic inspections and observe for the following performance indicators:

- Equipment serviceable and in good condition (screens)
- Personnel knowledgeable in sift operation
- Dust control (if applicable)

9. DATA COLLECTION AND REPORTING

Data collected during sifting operations include: number and types of MEC encountered by range, weight of MD recovered by range, weight of cultural debris recovered by range, amount of soil processed by range, and the final disposal location of various materials processed.

10. DUST MONITORING PLAN

This Dust Monitoring Plan presents the dust minimization, controls, and monitoring requirements that will be implemented during sifting operations. During site operations, personnel will implement dust controls as necessary, which will consist of spraying water as needed in the work areas and stockpiled soil to minimize fugitive dust. Heavy equipment speeds will be kept low (less than 15 miles per hour) to minimize dust emissions.

Two stationary dust monitoring stations will be operational during working hours if visible dust is observed. One dust monitor will be located in the work area to monitor dust levels for worker safety as indicated in the SOP-5. The second monitor will be located near the perimeter of the work area to monitor dust levels leaving the site. The dust monitors will continuously monitor the dust concentrations and record the dust concentrations every minute. The data will be downloaded at the end of each day and maintained in the project files for documentation purposes. The Washington Ambient Air Quality Standard for respirable particulate matter (PM_{10}) is 50 micrograms per cubic meter (mg/m^3), measured as a 24-hour time-weighted average (TWA). Although construction activities will not occur on a 24-hour basis, as a conservative approach, the action level for dust will be set as 50 mg/m^3. Personnel will periodically inspect the dust monitors to determine if the standard has been exceeded. If the action level is exceeded, dust control measures need to be increased and/or site operations need to be modified. Site management will also visually monitor the site for "visible" dust and take any necessary corrective actions to reduce or eliminate the visible dust emissions. Every effort will be made to ensure the site activities and dust controls are implemented such that the dust emissions are minimized and the ambient air quality standard is achieved.

11. DISPOSITION OF MATERIAL

All MD and non-MEC related material leaving the site will require the signature of the SUXOS and UXOQCS documenting that that the material is FFE using DD Form 1348-1A, July 91 (EG). The signatures will certify and verify the following statement:

"This certifies and verifies that the material presented herein has been 100% inspected and to the best of our knowledge and belief, are inert and/or free of explosives or related materials."

12. SUMMARY

This SOP will be used to ensure that the requirements for sifting operations are conducted in a safe, efficient, and productive manner. The UXOSO and PM will make changes to this SOP as safety and operational necessity dictate. Changes to the SOP will be documented using a field variance form and routed to Clark County and regulatory agency stakeholders for concurrence.

SOP - 16
UNANTICIPATED CHEMICAL CONTAMINATION CONDITIONS CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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Table 2 Client and Regulatory Agency Contact List

1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures applicable in the event that unanticipated chemical contamination conditions are encountered or suspected.

Unanticipated chemical contamination conditions may include, but are not limited to:

- oily, shiny, pigmented, or saturated soil or free product;
- soil with a strong chemical odor;
- discovery of objects or structures of environmental concern such as underground storage tanks and associated piping, buried drums, sumps, etc.;
- discovery of suspected debris of environmental concern such as buried refuse, painted building materials, asbestos-containing pipes, or Transite™;
- other conditions that vary materially from those documented during previous investigations;
- discovery of areas containing a high concentration of spent ammunition; and
- discovery of bulk explosives.

2. SCOPE

This SOP applies to all personnel involved in operations that have the potential to disturb or expose soil.

3. REFERENCE DOCUMENTS

Weston Corporate Safety and Health Program (FLD47)

ESCA RP Waste Management SOP

29 CFR 1910.120

29 CFR 1926.65

22 CCR Division 4.5

4. RESPONSIBILITIES

4.1 PROJECT MANAGER (PM)

The PM is responsible for ensuring that Clark County, the United States Department of the Army (Army), and the appropriate regulatory agencies (identified in Table 2 of this SOP) are notified.

4.2 SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training. The SUXOS will be responsible for providing notification to the Weston Solutions, Inc. (WESTON) Team members identified in Table 1 of this SOP.

4.3 UXO SAFETY OFFICER (UXOSO)

The UXOSO ensures that all operations are being conducted in a safe manner and in accordance with the appropriate work plan and this SOP. The UXOSO conducts safety audits of the operations and ensures that all personnel are properly trained and utilizing the appropriate personal protective equipment (PPE).

4.4 FIELD PERSONNEL

Field personnel will be conducting the fieldwork activities. Personnel conducting fieldwork activities are responsible for completing their tasks according to specifications outlined in this SOP and associated work plans. In the event that suspected soil contamination is encountered during fieldwork activities, field personnel must notify the SUXOS immediately.

4.5 ENVIRONMENTAL PROFESSIONAL

The environmental professional is a member of the WESTON Team who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and reach conclusions regarding conditions indicative of releases or threatened releases of hazardous substances to the soil. The environmental professional will be responsible for determining whether initial screening-level soil samples should be collected and/or notifying the PM that the County should be notified immediately, and ARMY and the appropriate

regulatory agencies should be notified within 24 hours by contacting their representatives listed in Table 2.

5. OPERATIONS

If suspected soil contamination is encountered during the fieldwork activities, the following procedures will be followed:

1. All field activities that may potentially disturb the unanticipated chemical contamination will be immediately stopped. Field personnel encountering the unanticipated chemical contamination must immediately notify the SUXOS and move to a safe location to avoid odors or leaking fluids (i.e., upwind or uphill).
2. If there is no immediate danger to personnel, field personnel will create an appropriate exclusion zone with markers and/or barricades around the suspect area to prevent further soil disturbance in this area.
3. If an emergency situation requiring medical attention, containment assistance, or other emergency assistance arises, the emergency procedures specified in the Site Safety and Health Plan will be followed.
4. The SUXOS will immediately notify the WESTON Team representatives listed in Table 1.
5. An environmental professional on the WESTON Team will be mobilized to visually assess the suspect area. If it is determined by the environmental professional that contamination by chemical compounds is possible (based upon visual observation or the analytical results of initial screening-level sampling), the environmental professional will notify the PM.

Examples of suspect contamination include the discovery of:

- oily, shiny, or saturated soil or free product;
- significant areas (greater than 3 square feet) of pigmented soil that do not appear to be related to native soil coloring;
- soil with a strong chemical odor;
- objects or structures of environmental concern such as underground storage tanks and associated piping, buried drums, sumps, etc.;
- significant quantities of suspect debris of environmental concern such as asbestos-containing pipes, Transite™, or similar ACM;
- significant quantities of suspected debris of environmental concern such as treated wood waste, chipping, cracking, or alligatoring paint (indicative of LBP), or electrical components;
- other conditions that vary materially from those documented during previous investigations;

- areas of high concentrations of spent ammunition; and
- bulk explosives.

The PM will notify the County immediately and ARMY and the appropriate regulatory agencies within 24 hours by contacting their representatives listed in Table 2. Information provided to the Army will include the location of the discovery (including Global Positioning System [GPS] location) and approximate depth of discovery; the site conditions at the time of discovery; and a description of changes to the site conditions since the discovery.

6. If practicable and if it is safe to leave the area exposed, the suspected contamination will not be disturbed until the Army has determined whether soil samples or remedial activities are necessary. Work should not resume in the affected area until remedial activities have been completed or the suspected chemical contamination is determined to be benign.
7. If the suspected contamination is not a U.S. Army-retained condition the WESTON Team may collect samples of the debris for classification purposes.
8. If samples collected by the WESTON Team indicate that the debris may have affected site soils, the WESTON Team will consult with Clark County and regulatory agencies to determine if additional investigation is necessary.
9. The WESTON Team will remove the debris until no visible material is present, segregate the debris for disposal, and classify the material for waste disposal.

6. PERSONAL PROTECTIVE EQUIPMENT

Appropriate PPE for the particular fieldwork activity will be utilized in accordance with the appropriate work plan. Equipment and clothing coming in contact with the potential contamination will be decontaminated in accordance with the appropriate work plan.

7. NOTIFICATIONS AND REPORTING

If unanticipated contamination is encountered or suspected in the field, the persons indicated in Table 1 must be notified immediately.

Table 1
Weston Team Contact List

Contact	Telephone (office/cell)
WESTON Team WESTON: George Overby (Project Manager) and Tony Clark (MEC Response and Removal Task Manager)	O- (864) 399-9902 C- (864) 320-3409 C – (831) 998-1616

Notes: If unanticipated contamination is visually confirmed in the field by a WESTON Team representative identified in Table 1, the appropriate persons indicated in Table 2 will be notified within 24 hours by a WESTON Team representative. The Clark County representative will be notified immediately.

Table 2
Client and Regulatory Agency Contact List

Title	Name	Telephone Number
Clark County PM	Jerry Barnett, PE	office: 360-566-6992
Clark County Munitions Safety Advisor	Greg Johnson, Master EOD	office: 360-566-6993 cell: 360-229-0529
WESTON SUXOS	Bruce Moe	cell: 831-240-1386
WESTON UXO Safety Officer	Randal Schneider	office: 256-430-3781
WESTON UXOQCS	Mike Everman	cell: 831-240-1391
WESTON PM	George Overby	office: 864.399.9902 cell: 864.320.3409
WESTON MEC Program Quality Manager	Al Larkins	office: 410-696-7260 cell: 443-280-7049
WESTON MEC Response and Removal Task Manager	Tony Clark	cell: 831-998-1616
Local Authorities, as directed	Department of Emergency Services	911
Bureau of Alcohol, Tobacco, Firearms and Explosives	--	800-461-8841

Notes:

EPA United Stated Environmental Protection Agency
DTSC California Environmental Protection Agency Department of Toxic Substances Control

If unanticipated contamination is encountered, the WESTON Team will document it in a report that is submitted to the regulatory agencies within 30 days after the discovery of the unanticipated contamination. This report will include the following:

- brief description of the nature of suspected contamination and how it was discovered;
- verification of notification of personnel listed in Table 2;
- description/verification that the procedures outlined in this SOP were followed to alert the Army of the presence of a retained condition (if applicable); and
- characterization (including stockpile and confirmation sampling) data collected.

SOP - 17
QUALITY CONTROL PROCEDURES AND GEOPHYSICAL DATA PROCESSING CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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Table 2 Typical DQO for DGM

1. PURPOSE

This procedure outlines the technical requirements and procedures for geophysical data processing and basic QC metrics established for geophysical projects.

2. APPLICABILITY AND SCOPE

The requirements of this procedure are applicable to all project activities which include the use of the EM61-MK2 and G-858 magnetometer either single sensor or array configuration. The data processing steps and QC metrics outlined in this SOP require intermediate knowledge of Geosoft Oasis Montaj (main geophysical processing software used by Weston Solutions, Inc.[WESTON])

3. REFERENCES

Oasis Montaj Manual version 6.4, 2008.

4. DEFINITIONS

Geosoft Oasis Montaj—WESTON's main processing software for all electromagnetic data and magnetometry data collected during field survey.

5. QUALITY CONTROL

This section outlines the basic concepts and techniques used to measure and process QC data. Table 1 illustrates the basic list of QC tests that are run at every project and the frequency in which they are to be performed. The tests will now be explained below.

Equipment Warm-up—All geophysical equipment must be warmed up for at least 5 minutes dependent on ambient temperature. This allows the sensors to regulate themselves.

- For the Mag G-858 execute the SELF TEST “Magnetometer Test” to confirm that values for the Battery, Lithium, RF, Bright, Cold, and Signal are appropriate with normal warm up values documented in the Magmapper Ops Manual.

Record Sensor Positions—All sensor positions and navigation system offsets will be recorded daily on the field notes. This will allow the processing geophysicist to accurately locate all sensors in space.

Personnel Test—Operators of the equipment should check themselves for influence on the sensor readings by approaching the sensors and noting the readings before and after (operators should remove all metal from the person before running this test). This test does not need to be recorded but should be ran every day to ensure the operator does not have any metallic items that may interfere with the survey (i.e. metal grommets on boots are a typical factor).

Vibration Test (Cable Test)—The operator collects data and moves cables and electronics to note any possible fluctuations (may indicate a broken wire or an electronic interference from some data loggers).

Static Background—The operator collects data for a period of 3 minutes over a background area. The purpose is to identify any variations in the collected signal. The amplitude should remain constant within +/- 2.5 mV for EM and 3 nT/m for MAG.

Static Spike—The operator collects data for a period of 3 minutes over a spike object (usually a 2 in. pipe or 2 in. trailer ball). The purpose is to identify any variations in the collected signal. The amplitude should remain constant within +/- 2.5 mV for EM and 3 nT/m for MAG.

Repeat Data—The operator collects data over a predetermined survey line (original line) and then collects a separate line over the same position (repeat line). The data is then compared and the repeat line must have an amplitude within 20% of the original line and navigational accuracy within +/- 20 cm. Note a QC repeat survey is different from a repeat line. Quality Control repeat surveys are a repeat of a predetermined portion of a survey area where the data is collected again and selected targets and processed results are compared. Quality Control repeat surveys are project specific requirements and not required for all surveys.

Height Optimization Test—This test is performed at the beginning of the project to determine the optimal operating height of the data collection instrument. The test is performed by measuring the response of a calibration object (usually the smallest item of interest at your site)

and varying the depths of this object to determine the height that yields the highest signal to noise quality.

Instrument Specific Tests—There are several instrument specific tests associated with magnetometry that also need to be performed at the beginning of the project.

- Azimuth Test—the test is performed if using the line and fiducial method and is performed by placing the sensor over a background area and rotating around this point in the cardinal directions and recording the results. The results are entered into a heading table and used to correct heading errors associated with affects from direction of survey.
- Octant Test—the test is performed when the instrument is interfaced with a navigational system. A background spot is marked on the ground and the operator traverses in all cardinal directions (at least 10 feet on either side of the spot). The database is then analyzed and a heading correction table is automatically generated from the data.

6. DATA METRICS

Sample Rate—The sampling rate will be conducive to the target size expected. For example on MEC projects with small MEC a sampling rate of 10 Hz (hertz – samples/second).

Sample Separation—The sample separation will not exceed 0.5 feet along line. Sample separation is calculated through Oasis Montaj's Sample Separation Calculation tool. This tool creates a map and lets the processing geophysicist examine if sample separation metrics are exceeded.

Velocity—Velocity less than 3.0 mph will be maintained at all times. Optimal velocity has been noted around 2.0 to 2.5 mph. Velocity is calculated through Oasis Montaj's Velocity Calculation tool. This tool creates a channel in the survey database and lets the processing geophysicist examine if velocity metrics are exceeded. Logging velocity can also be monitored during data collection when using MagLogNT and NavTrack61MK2.

Line Spacing—also known as across line spacing, is the distance of one survey line to the previous survey line measured perpendicular (normal) to each other. The maximum line spacing allowed is 2 feet.

Navigation Accuracy—Navigation accuracy will be checked and documented daily by using a known point. This accuracy check is performed during the latency test as the latency test already makes use of known items and the location. The location accuracy of the peak response after latency correction will be with 1 foot of the actual location.

Diurnal Correction—This correct applies specifically to magnetometry data. Diurnal data will be monitored separately using a BaseStation (G-856) to monitor the daily natural magnetic background fluctuations. The data are used to apply a correction to the collected total field data with the G-858 sensors. The correction removes the daily diurnal effects from the data and is applied during the export process of the magnetometry data.

Drift Correction—Drift correction is applied to remove the fluctuation ("drift") in the instrument thought the survey. Instruments (especially the EM61-MK2) are noted to drift thought the day due to mainly temperature related issues in the day, which causes the electronics box to warm or cool affecting the response of the instrument. Drift is determined by using the no response signals (background – non amplitude signals) and applying a non-linear filter to the collected data, this filter can be changed to a zero-order trend, first order trend, second order trend removal, median or a combination of all the above. There are several ways to determine the drift of your survey. A statistical breakdown of your survey can be run illustrating the breakdown of your survey and will more adequately allow the processing geophysicist to determine drift parameters to apply. Collecting a "tie-line" in the field at the end of the survey. A tie-line is a separate line collected from the end of the survey (most recently collected data) perpendicular across the survey to the first survey line. This will allow the processing geophysicist to create a tie-line channel and use this data to run the drift correction.

Processing DQO Statement—All drift correction and/or filtering routines that are applied to datasets will be evaluated, on a dataset by dataset basis, to confirm that those routines do not alter the nature of the original measured response. All data processing steps will be recorded in the database audit log or a separate data processing form.

EM61-MK2 Sum Channel—WESTON utilizes a Sum Channel (sum of the individual drift corrected channel data 1-4) to grid datasets and select targets. WESTON has noticed that by using the Sum helps to eliminate smaller noise induced targets.

Magnetic Analytic Signal—The analytical signal is a result of taking the X, Y, and Z derivative and using those grids to calculate the Analytic Signal grid. The Analytic Signal grid can be thought of the measured rate of change over an anomaly. It collapses dipole signatures to a single point (usually located at the inflection point) and is used to select targets.

7. TARGET SELECTION

Targets will be selecting using the 4 channel sum for Electromagnetic data and the analytic signal channel for magnetometry data.

Initial Target Selection Threshold—The initial target selection threshold will be determined using the GPO/Test Plot data and determining what threshold is needed to select the smallest MEC item at the detection depth for the instrument. After the initial target selection threshold is determined, that threshold must be used throughout the project. The threshold can be changed after digging has commenced and the threshold is deemed too low, a project meeting must take place with all decision makers present and supporting evidence presented to raise the threshold. The threshold cannot be changed unless all stakeholders in the project are in agreement.

Target Selection—The Project Geophysicist will perform an automatic anomaly selection based on the Stack or Analytic Signal channel using UX-Detect Blakely algorithm within Oasis Montaj and the agreed upon selection threshold. A review of decay profiles (for the appropriate channels in EM data) at all suspect and/or low-amplitude anomalies will be performed to remove anomalies from the list not exhibiting response characteristics typical of buried metallic objects. A manual review of the remaining anomalies will be conducted to center the anomaly response as needed. All corrected geophysical data and anomaly locations will be exported to a database according to DID guidelines.

8. TYPICAL DATA PROCESSING SCENARIO

8.1 INITIAL FIELD PROCESSING

Initial field processing will include data file QC review and correction of the following:

- File/Grid or mile mark identification and location.

- Precision of the navigational data—An initial QC check will be performed on data collected using a 2-Point Function Test, which will be conducted on the established QC site near the GPO grid at the beginning and end of each work day. This data will be reviewed on a daily basis for precision of the navigational field data relative to known, geo-referenced items.
- Checking navigational data for comprehensive coverage—The data will be reviewed to locate gaps in survey coverage in the data set that may require additional fill-in.
- Reviewing data sets and QC tests with respect to signal to noise levels and acceptance criteria.
- Removal of data dropouts and spikes associated with interference sources.
- Begin initial data processing after all QC tests have been deemed valid.

8.2 DATA PROCESSING

Gridded plots for sum of the EM time gates/channels (Stack channel) will be prepared and transposed on electronic site base maps. The plots will be used to mark the horizontal dimensions of subsurface anomalies using Oasis Montaj™ (UX-detect) geophysical software. The crew will perform a comprehensive data analysis as described above to produce digital target tables, target maps, and identify and evaluate all geophysical anomalies detected by the geophysical instrument. Initially, the project geophysicist will process and interpret the four channels conducting a collective review of the respective decay characteristics. A summation of appropriate channels will be performed and the Stacked or Analytic Signal data will be processed. The final output will include processed data for the Stack or Analytic Signal (based on signal-to-noise ration [SNR] statistics for the site) and will include an automatic/manual anomaly selection. The Oasis software database audit log will also be reviewed as part of the QC process.

8.3 QUALITY CONTROL OF TARGET SELECTION

A quality control of selected targets is performed by measuring selected targets over known QC points (usually grid corner spikes or implanted QC seeds within the grid).

9. ANOMALY SELECTION

Targets will be selecting using the Stack channel for Electromagnetic data and the analytic signal channel for magnetometry data.

Gridded plots for sum of the EM time gates/channels (Stack channel) will be prepared and transposed on electronic site base maps. For the Magnetometer data, grid plots of the vertical gradient, analytic signal or total field (as defined in the Work Plan) will be prepared and transposed on electronic site base map. The plots will be used to mark the horizontal dimensions of subsurface anomalies using Oasis Montaj™ (UX-detect) geophysical software. The crew will perform a comprehensive data analysis as described above to produce digital target tables, target maps, and identify and evaluate all geophysical anomalies detected by the geophysical instrument. Initially, the project geophysicist will process and interpret the four EM channels conducting a collective review of the respective decay characteristics. A summation of appropriate channels will be performed and the Stacked (EM) or Analytic (MAG) Signal data will be processed. The final output will include processed data for the Stack or Analytic Signal (based on signal-to-noise ration [SNR] statistics for the site) and will include an automatic/manual anomaly selection. The Oasis software database audit log will also be reviewed as part of the QC process.

Initial Target Selection Threshold—The initial target selection threshold will be determined using the GPO data and determining what threshold is needed to select the smallest MEC item at the detection depth for the instrument. After the initial target selection threshold is determined, that threshold must be used throughout the project. The threshold can be changed after digging has commenced and the threshold is deemed too low, a project meeting must take place with all decision makers present and supporting evidence presented to raise the threshold. The threshold cannot be changed unless all stakeholders in the project are in agreement.

Target Selection—The Project Geophysicist will perform an automatic anomaly selection based on the Stack or Analytic Signal channel using UX-Detect Blakely algorithm within Oasis Montaj and the agreed upon selection threshold. A review of decay profiles (for the appropriate channels in EM data) at all suspect and/or low-amplitude anomalies will be performed to remove anomalies from the list not exhibiting response characteristics typical of buried metallic objects. A manual review of the remaining anomalies will be conducted to center the anomaly response as needed. All corrected geophysical data and anomaly locations will be exported to a database according to Appendix C of the USACE DID guidelines.

Quality Control of Target Selection—A quality control of selected targets is performed by measuring selected targets over known QC points (usually grid corner spikes or implanted QC seeds within the grid).

10. PREPARATION OF TARGET DATA BASE AND DIG INFORMATION

Exporting Target Information—all targets that have passed geophysical manual review and are to be selected for reacquisition and digging must be exported with the necessary reporting information as mandated by the DID.

- Reacquisition Sheets—reacquisition sheets are supplied to the reacquire team so targets can be tracked as they are reacquired in the field using the same navigational method used to collect the data.
- Navigation Target Location File—a comma delimited file containing target ID, Northing, and Easting (in that order with no header info) to be uploaded into the navigation data collector for reacquisition.
- UXOFast Upload File—a predefined formatted excel file that is used to upload targets to UXOFast.
- Target Dig Map—map of the grid area (if the scale is applicable) showing target locations and name for aid in reacquisition and digging.

Applicable References:

USAESCH (U.S. Army Engineering Support Center, Huntsville). 2003. Munitions Response Data Item Descriptions (DIDs). Revised 1 December 2003.

Project Specific Work Plan - Data Quality Objectives (DQO) with established metrics.

Table 1
QC Tests for Geophysical Surveys

Test Description	Acceptance Criteria	Power On	Beginning of Day	End of Day	1 Line per Day
Equipment Warm-Up	Equipment Specific (5-15 minutes)	**X**			
Record Sensor Positions	± 1-inch (2.54 cm)		**X**		
Personnel Test	EM-61 2 mV p-p, Mag 3 nT p-p		**X**		
Vibration Test	Data profile does not exhibit spikes		**X**	**X**	
Static Background	Background: EM61-MK2 +/- 2.5 mV		**X**	**X**	
Static Spike	20% of standard item response		**X**	**X**	
Repeat Data	Repeatable ± 20% of response amplitude, ± 20 cm for positional accuracy				**X**

Notes:

Static and cable Vibration Tests must be performed with the sensor in a fixed "static" position. It is recommended that a non metallic jig or stand be used for this procedure. It is imperative that the operator avoid moving or influencing the sensor during these tests.

Table 2
Typical DQO for DGM

Typical DQO Parameters		Typical Metric	How QC Metrics are Measured	Rationale
1	Standard deviation of background noise	EM – (summed channel) = i.e. < 2 mV Mag Analytic Signal	Run statistics on all data below a reasonable level (i.e. between 7 and 9 mV)	Decreased noise = lower false positives
2	Mean acquisition speed	= i.e. < 2.5 mph	Run statistics on velocity between points in each file (created a "velocity" channel)	To provide appropriate data density to resolve smaller items
3	Along track measurements[1]	= i.e. < 0.5 feet, across track = i.e. < 3 feet	Metric based on mean speed during GPO	Lower speed = less "vibration" and system noise
4	Sum of positioning errors	= i.e. < 1-foot	Developed navigation test appropriate to sensors control point AM track plots PM track plots	
5	Instrument latency	No chevron patterns in interpretation maps	Evaluation (visual review) of gridded data	To reduce duplication of introduction of false positive anomaly selections
6	Consistency of processing parameters within a dataset	Identical for each channel within a dataset	Analyst applies common set of parameters (leveling and drift routine filters), for processing all channels within dataset	All signals to undergo standardization to support anomaly prioritizations[2]
7	Signal to noise variance	= i.e. < lesser of 5% or 5 mV	Random review of 3 small (less than 100 mV) and 3 large (greater than 100 mV) anomalies per dataset	To compare preprocessed and final processed peak responses
8	Automated anomaly selections based on sum of channels or AS	Verify we maintained peak response characteristics in the event anomaly is ambiguous	All automated anomaly selections will be based on sum of all channels and reviewed by a geophysicist	1 To confirm low amplitude anomalies are not "processed-out" 2. To facilitate anomaly prioritization if needed

Table 2
Typical DQO for DGM

Typical DQO Parameters		Typical Metric	How QC Metrics are Measured	Rationale
9	Random anomaly review	Reacquisition = i.e. < 2 feet	A random sample of anomalies (i.e. 2 per acre) to be reacquired and confirmed	To demonstrate anomaly reproducibility (random reacquisition) and anomaly detections (blind QA items), both to within 2 feet, the data would be defensible in supporting project objectives
10	Placement of blind seed item within a grid	Tests detection and selection of anomaly (i.e. within 2 feet of known location)	The QA geophysicist places blind seeds throughout the survey area at a rate of 1 per 2 acres	To confirm quality of detection and accuracy/precision of navigation

Notes:

1 Some (team decision) flexibility is required, to allow gaps (over entire survey area) up to an acceptable limit relative to design metrics and stated objectives.

2 Some exceptions with complex data or parsed sections affected by cultural interference.

Subject to revision per site specific work plan.

SOP - 18
CORRECTIVE AND PREVENTIVE ACTION
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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LIST OF ATTACHMENTS

Attachment 1 Event and Causal Factor Codes

Attachment 2 Severity Level Description

1. PURPOSE

This standard operating procedure (SOP) describes the method for conducting root cause analyses of severity level 1 nonconformities identified by NCRs and customer complaints, and evaluating the need for action to ensure that the nonconformities do not recur. Descriptions of the severity levels are provided in the SOP for Material and Activity Non-conformances.

The procedure establishes the methodology to conduct trend analyses of nonconformities identified through NCRs for severity levels 2, 3, and 4, corrective actions, quality surveillance reports, and internal audit results, to identify the repetitive nonconformities and determine preventive action to eliminate the cause of potential repetitive nonconformities.

2. RESPONSIBILITIES

2.1 PROJECT MANAGER (PM)

The PM will establish an operations project team to investigate the root cause of a severity level 1 nonconformance and recommend action to prevent the recurrence.

The PM is responsible for reviewing the results of the root cause analysis and trend analysis, assigning corrective and preventive actions, and monitoring process performance as a part of the PM's management review.

2.2 UNEXPLODED ORDNANCE QUALITY CONTROL SPECIALIST (UXOQCS)

The UXOQCS will provide support to effectively implement this SOP. Additionally, all root cause analyses, trend analyses, and preventive action reports will be reviewed and recommendations will be provided if applicable.

2.3 SENIOR UXO SUPERVISOR (SUXOS)

The SUXOS will periodically conduct trend analysis of nonconformities from the sources described herein, and report the results to the PM and UXOQCS.

3. PROCEDURES

3.1 ROOT CAUSE ANALYSIS

The operations project team appointed by the PM will determine the root cause of a severity level 1 nonconformance. The root cause determination will depend upon project-specific factors affecting the product development, product conformity, or process performance. The nonconformity may be classified using event and causal factor codes (Attachment 1) following the root cause analysis. The root cause analysis will identify corrective actions to prevent recurrence. The record of the root cause analysis and corrective action taken will be maintained on file with the UXOQCS as a part of the project record.

3.2 TREND ANALYSIS

The operations project team review results from the following sources and perform a trend analysis when sufficient information and data are available to ensure that the analysis is meaningful. Typically, a trend analysis should be conducted once at least every 6 months for projects of 1 year or longer in duration. For short-duration projects, the trend analysis should be done at about the halfway point.

1. Corrective actions (severity level 1 NCRs, customer complaints)
2. Internal and external (including customer) audit results, quality surveillance/audit reports
3. NCRs (severity levels 2, 3, or 4)

3.3 PREVENTIVE ACTION

For the period under review, the project operations team shall determine the root cause(s) of potential repetitive nonconformities and evaluate the need for action to prevent their recurrence. The project operations team will prepare a report identifying the nonconformities for each area of the project processes/procedures, a consolidated summary of root causes of the nonconformities, and a statement of trends that are developing or have developed, and submit the report to the PM. The PM will provide appropriate corrective actions to the UXOQCS to prevent recurrence of the adverse trends. The team and the UXOQCS will verify implementation of the preventive actions and report the results to the PM. The record of trend analysis and preventive action taken will be maintained on file by the UXOQCS as a part of the project record.

Attachment 1
Event and Causal Factor Codes

Event		Causal Factor	
Code	**Description**	**Code**	**Description**
A	Noncompliance with standards, policies, procedures, or other administrative controls	1	Incorrect or inadequate procedures
B	Human error/inattention to detail	2	Insufficient, inadequate, or lack of training
C	Failure to meet contractual requirements	3	Inadequate supervision/management skills or practices

Attachment 2
Severity Level Description

SEVERITY LEVEL	DESCRIPTION
1	A classification assigned to a condition that indicates repeated failures to prescribe or implement requirements properly, whose effect is systemic in nature, and that undermines the ability to ensure and demonstrate confidence in quality or safety.
2	A classification assigned to a condition that indicates a systemic failure to prescribe or implement requirements properly and whose effect undermines the ability to ensure and demonstrate confidence in quality or safety.
3	A classification assigned to a condition that indicates a systemic failure to prescribe or implement requirements properly. Its effect, however, on quality or safety is minimal.
4	A classification assigned to an obviously isolated condition that indicates a failure to prescribe or implement requirements properly and is non-systemic, but could lead to a Severity Level 3 or higher condition.

SOP – 19
MATERIAL OR ACTIVITY NON-CONFORMANCE CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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LIST OF ATTACHMENTS

Attachment 1 Severity Level Description

Attachment 2 Nonconformance Report (NCR) Log

1. PURPOSE

This standard operating procedure (SOP) describes the means for the identification, control, handling, review, and disposition of nonconforming material and activities during all phases of the work at the former Camp Bonneville to prevent the unintended use or delivery of inadequate materials and/or work products.

2. RESPONSIBILITIES

Unexploded Ordnance Quality Control (UXOQC) personnel have the responsibility to identify, document, and report material, items, or activities that do not conform to prescribed technical and/or quality requirements during all phases of the project.

2.1 PROJECT MANAGER (PM)

The PM has overall responsibility for implementing this procedure and for ensuring the availability of the resources needed to implement this SOP, and will also ensure that this SOP is incorporated in plans, procedures, and training for sites where this SOP is to be implemented.

2.2 SENIOR UXO SUPERVISOR (SUXOS)

The SUXOS will be responsible on behalf of the PM for receipt of all non-conformance reports (NCRs) and the determination of their disposition to correct the non-conforming condition accordingly.

2.3 UXO QUALITY CONTROL SPECIALIST (UXOQCS)

The UXOQCS will be responsible on behalf of the PM for ensuring this SOP is effectively implemented.

3. PROCEDURES

UXOQC personnel will document nonconforming materials, items, or activities in an NCR. Instructions for completing an NCR are provided with the form. A hard copy or an electronic version may be used. The initiator shall fill out the description and apparent cause of the nonconforming condition. The UXOQCS will review, validate, denote severity level

(Attachment 1), assign the corrective action due date, and sign the NCR. The UXOQCS will establish and maintain a log of NCRs issued and track the progress of each NCR using the NCR log (Attachment 2).

3.1 NON-CONFORMANCE CONDITION/RELEASE

After the NCR is received and validated by the SUXOS, a nonconforming condition may be conditionally released if justified in writing and approved by the PM or, where applicable, by the customer. Justification of release will be retained on file as a project record.

3.2 NCR DISPOSITION/REVIEW

The SUXOS may designate a competent individual, knowledgeable in the requirements and with access to pertinent information, to provide recommendations for the NCR's disposition as one of the following rework categories to meet the original requirements: re-clear, resurvey, reacquire, reprocess, or other with explanation. The PM shall also review and concur with the recommended corrective action prior to implementation. Any corrective action is to be completed by the corrective action due date assigned on the NCR form.

For a severity level of 1, root cause analysis and corrective action (see SOP for Corrective and Preventive Action) to prevent recurrence is required.

3.3 NCR CLOSURE

A verifier appointed by the UXOQCS will verify satisfactory completion of actions for disposition of the non-conformance. Reworked items will be re-inspected to demonstrate conformance to the requirements. If UXOQC personnel determine the corrective action completed is insufficient, the UXOQCS will disapprove the corrective action and initiate a new NCR documenting the determining unsatisfactory factors in the closeout comments section. If the corrective action implemented by the SUXOS effectively eliminated the nonconforming condition, the manner in which the corrective action was verified by UXOQC personnel will be documented by UXOQC personnel in the closeout comments section.

Attachment 1
Severity Level Description

SEVERITY LEVEL	DESCRIPTION
1	A classification assigned to a condition that indicates repeated failures to prescribe or implement requirements properly, whose effect is systemic in nature, and that undermines the ability to ensure and demonstrate confidence in quality or safety.
2	A classification assigned to a condition that indicates a systemic failure to prescribe or implement requirements properly and whose effect undermines the ability to ensure and demonstrate confidence in quality or safety.
3	A classification assigned to a condition that indicates a systemic failure to prescribe or implement requirements properly. Its effect, however, on quality or safety is minimal.
4	A classification assigned to an obviously isolated condition that indicates a failure to prescribe or implement requirements properly and is non-systemic, but could lead to a Severity Level 3 or higher condition.

Attachment 2
Non-conformance Report (NCR) Log

NCR NUMBER	SITE	GRID NUMBER	SEVERITY LEVEL	DATE INITIATED	CURRENT STATUS	DATE COMPLETED	COMMENTS
TOTAL							
NCRS							
COMPLETE:							
INCOMPLETE:							
% COMPLETE	%						

SOP - 20
MEC WITH UNKNOWN FILLER
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures and safety and health requirements applicable in the event ordnance items are discovered and the filler cannot be positively determined at the former Camp Bonneville.

A Chemical Warfare Material (CWM) Risk Assessment has been completed for the former Camp Bonneville. The results indicated that the probability of encountering CWM munitions is "unlikely" while the probability of encountering CWM Chemical Identification Sets is "seldom."

2. SCOPE

This SOP applies to all personnel involved in the conduct of munitions and explosives of concern (MEC) clearance on the former Camp Bonneville.

3. REGULATORY REFERENCES

AR 385-61, AR 385-64, DA Pam 385-61, and DA Pam 385-64 for safety concerning Recovered Chemical Warfare Material (RCWM) containing explosives

AR 50-6, Chemical Surety

AR 190-11 Security for RCWM

EP 75-1-3 RCWM Response Process

4. RESPONSIBILITIES

4.1 PROJECT MANAGER (PM)

The PM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SUXOS)

The SUXOS is responsible for incorporating this SOP in plans, procedures, and training and ensuring that all personnel conducting MEC operations are familiar with and comply with this SOP.

4.3 UXO SAFETY OFFICER (UXOSO)

The UXOSO ensures that all operations pertaining to MEC clearance are being conducted in a safe manner and in accordance with the appropriate work plans and this SOP. The UXOSO conducts safety audits of the operations and ensures that all personnel are properly trained and utilizing the appropriate personal protective equipment (PPE).

4.4 UXO TEAM LEADER

The UXO Team Leader is responsible for supervision of the team conducting the clearance operation. The UXO Team Leader is required to conduct training of personnel involved in MEC operations to ensure that every member of the MEC team thoroughly understands this SOP.

5. OPERATIONS

5.1 GENERAL

There are three ordnance items of concern that require positive identification of the filler prior to any disposition, the Livens Projector, the 4-inch Stokes mortar, and the 4.2-inch mortar.

Visual recognition of the Livens Projector, 4.2-inch mortar, and the 4-inch Stokes is necessary and requires training on recognition features to ensure everyone uses the same techniques. The 4-inch Stokes mortar of concern is 19.56 (19/16) inches in length, measured from the end of the tail boom to the top of the threaded fuze well. 4-inch Stokes mortars of lesser lengths contain known fillers and will be treated as any other MEC item.

- All Livens Projectors and all 4.2-inch mortars are common in dimensions and have different fillers. These ordnance items along with the 19.56-inch-long, 4-inch Stokes will be treated as MEC with unknown fillers.
- Upon recognition/identification of a Livens Projector, a 4.2-inch mortar, or a 4-inch Stokes by any UXO team member conducting a MEC clearance operation, the team

member will immediately notify the Team Leader who will measure the item. If the measurements indicate a possible CWM-filled Stokes, or if the item recognized/identified is a 4.2-inch mortar or a Livens Projector, the Team Leader will notify the SUXOS and the UXOSO.

- The UXO team and any other teams in the area will evacuate the area, proceeding at least 200 feet upwind, and await the UXOSO and the SUXOS.
- Upon arrival of the UXOSO, the UXO Team Leader will accompany her/him to the location of the suspect item.
- In the event the UXOSO and SUXOS determine that the item contains a known filler other than CWM, it shall be disposed of in accordance with the work plan.
- Upon verification by the UXOSO and SUXOS of an MEC item with an unknown filler, the exact location will be recorded using a Global Positioning System unit and backfilled with excavated material. The UXO Team Leader will evacuate to the safe area upwind, and the UXOSO and SUXOS will notify the PM who will notify the Clark County Project Manager and Munitions Safety Officer who will notify the Technical Escort Unit (TEU).
- In the event TEU or the EOD unit positively identifies the filler as CWM, or the filler remains unknown, TEU or the EOD unit will make the determination for and conduct a safe disposal of the item.
- In the event TEU or the EOD unit positively identifies the filler as non-CWM, they will release the item to WESTON for disposal in accordance with the work plan.

6. SAFETY

6.1 GENERAL

At no time will a Livens Projector, a 4.2-inch mortar, or a 4-inch Stokes mortar measuring 19.56 inches in length (fuzed or unfuzed) be moved prior to disposition determination by TEU.

6.2 PPE

Standard PPE for field MEC operations will be utilized in accordance with the work plan.

SOP - 21
MEC DETONATION
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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Attachment 1 Form M-2, Explosive Demolition Operations

Attachment 2 Worker's Statement

1. PURPOSE

The purpose of this standard operating procedure (SOP) is to provide the step-by-step procedures for personnel to safely perform periodic munitions and explosives of concern (MEC) disposal activities, related to either immediate response blow-in-place (BIP) operations or pre-planned demolition operations, during the field activities at the former Camp Bonneville.

MEC hazards are unique and require a greater level of awareness and attention-to-detail than everyday construction projects. These procedures provide step-by-step instructions. References contain comprehensive procedures for conducting demolition operations and should be referred to for any situation not covered by this instruction. This SOP complies with the requirements of all applicable Army and U.S. Department of Defense instructions and safety regulations, Federal, State and local requirements and applicable Occupational Safety and Health Administration (OSHA) Standards.

2. SCOPE

This SOP applies to all Weston Solutions, Inc. (WESTON) personnel involved in MEC demolition/disposal operations at the former Camp Bonneville Military Reservation.

3. REFERENCE DOCUMENTS

OSHA General Industry Standards, 29 CFR 1910

OSHA Construction Standards, 29 CFR 1926

General Dynamics Military Hardened Remote Firing Device (RFD) Operating Manual ("RFD Operating Manual")

4. RESPONSIBILITIES

4.1 PROJECT MANAGER (PM)

The PM is responsible for ensuring availability of resources required to safely implement this SOP.

4.2 SENIOR UNEXPLODED ORDNANCE SUPERVISOR (SUXOS)

The SUXOS is responsible for ensuring that all disposal operations involving MEC are conducted in a safe and professional manner. The SUXOS will assign a Demolition Supervisor and other essential personnel as required for the disposal operation. The SUXOS has the authority to suspend, withdraw, or otherwise de-certify personnel unable to fulfill training, qualification, and/or operational requirements. The SUXOS will initiate all public telephone notifications and act as an independent safety observer during disposal operations if the Unexploded Ordnance Safety Officer (UXOSO) is unavailable.

4.3 UNEXPLODED ORDNANCE SAFETY OFFICER (UXOSO)

The UXOSO is responsible for ensuring that unexploded ordnance (UXO) disposal operations involving hazardous and/or explosive materials are conducted in a safe and professional manner. The UXOSO will act as an independent safety observer during disposal operations. If the SUXOS is unavailable, the UXOSO will initiate all public telephone notifications.

4.4 DEMOLITION SUPERVISOR

The demolition supervisor will be a licensed Washington State Blaster and will be responsible for the supervision of drawing of explosive stores, preparation, placement, and firing of all explosive charges. A Demolition Supervisor is required for all demolition operations. The Demolition Supervisor will be selected prior to the start of any demolition operation and is the primary supervisor for the disposal operation and will report to the SUXOS.

5. TELEPHONE NOTIFICATION

The following individuals will be notified via telephone by the SUXOS or designate:

Organization	Contact	Phone Number:
Clark County PM	Jerry Barnett	360-566-6992
Clark County MSO	Greg Johnson	360-566-6993
Clark County Sherriff Dept.	Dispatch	360-397-2211
Clark County Fire District 3	Dispatch	360-687-6968
WESTON PM	George Overby	864-399-9902
WESTON MEC Response & Removal	Tony Clark	831-998-1616

Organization	Contact	Phone Number:
Task Manager		

6. ELECTRONIC NOTIFICATION

6.1 WESTON

WESTON will initiate all electronic notifications upon the event of MEC detonation.

6.2 NOTIFICATION LIST

The following individuals will be notified via electronic mail:

Recipient:	Email Address:
Clark County PM	Jerry.Barnett@clark.wa.gov
Clark County Munitions Safety Officer	Greg.Johnson@clark.wa.gov
Copied:	**Email Address:**
George Overby, WESTON PM	George.Overby@westonsolutions.com
Tony Clark, WESTON Ops	Tony.Clark@westonsolutions.com
Bruce Moe, WESTON SUXOS	Bruce.Moe@westonsolutions.com
Randy Schneider, WESTON UXOSO	Randy.Schneider@westonsolutions.com
Michael Everman, WESTON UXOQCS	Michael.Everman@westonsolutions.com

6.3 NOTIFICATION LANGUAGE

The following standard language will be used in electronic notifications:

"The WESTON Team will conduct a detonation of a (INSERT ITEM(s) TO BE DETONATED). The detonation will be conducted (INSERT GENERALIZED LOCATION). This operation will occur between (INSERT TIME AND DATE). If you have any questions please contact the WESTON Response & Removal Task Manager."

7. EQUIPMENT AND MATERIALS

7.1 PERSONAL PROTECTIVE EQUIPMENT

- leather gloves
- safety glasses with side shields (ANSI Z87.1 standard)
- Level D PPE

7.2 EQUIPMENT

- backhoe, as required
- water supply/dust control vehicle, as required
- 4-wheel-drive pickup or other off road vehicle
- Explosives transport vehicle (safety inspected, properly equipped, fire extinguishers etc.)
- digital photograph or video camera
- Two way radios
- binoculars

7.3 COMMUNICATION EQUIPMENT

The primary method of communication on the range will be handheld radios with cellular phones as a secondary backup. A minimum of two working radios are required to be on site and radios will be tested prior to the start of disposal operations. The following communication equipment is approved for use:

- radios - transceivers up to 5 watts
- cellular phones (all)

Communication Equipment	Hazards of Electromagnetic Radiation to Ordnance (HERO) Unsafe Distance
Radios	Within 25 feet
Cellular phones	Within 25 feet

CELLULAR PHONES WILL BE TURNED COMPLETELY OFF WHEN WORKING NEAR HERO-SENSITIVE MUNITIONS AND DEMOLITION MATERIALS.
(PHONES TRANSMIT RADIO FREQUENCY ENERGY EVEN WHILE IN STANDBY MODE)

7.4 SAFETY EQUIPMENT

- siren/horn
- road barricades (hazard communication)
- first aid kit in each truck
- fire extinguisher

7.5 HAND TOOLS

- shovels
- rakes
- mattocks, as required
- other tools, as required

7.6 DEMOLITION MATERIALS

- blasting machine (quantity 1)/RFD (quantity 2)
- galvanometer (quantity 1)
- electrical tape (minimum 1 roll)
- duct tape (minimum 1 roll)
- water jug (5-gallon)
- firing wire
- sand/sandbags

8. SAFETY

8.1 GENERAL SAFETY PRECAUTIONS

All personnel conducting range operations involving the use of explosives, pyrotechnics, and cartridge actuated devices will follow the approved guidance provided in this instruction and associated references. Any deviation from the approved SOP must be authorized by the SUXOS.

The following "General Safety Precautions" apply to all ordnance disposal work:

- A copy of this instruction will be maintained at the Field Operations Office.
- Smoking or spark/flame producing devices will not be permitted within 100 feet of any explosive material.
- The Demolition Supervisor will supervise the control of all blasting caps or initiating devices.
- The Demolition Supervisor will control the RFD Key.
- All crimping and priming procedures will be directed and supervised by the Demolition Supervisor.
- The preparation of initiators will be performed at a distance of not less than 50 feet from any other explosives.
- Use the minimum number of personnel necessary to perform the demolition operation safely (a minimum of two is required).
- Ensure the area is clear of any unauthorized personnel, vehicles, or low flying aircraft before beginning any demolition procedure.
- Do not handle, use, or remain near explosives during the approach or egress of an electrical storm. All personnel involved in any demolition operation in such a case should immediately retreat to a place of safety.
- Always point the explosive end of blasting caps, detonators, and other explosive devices away from the body and any other person who may be in close proximity. These items are extremely dangerous and may cause serious injury if they detonate.
- Use only approved tools when handling demolition materials.
- Personnel conducting demolition operations will wear cotton clothing to minimize the risk of static electricity.
- Personnel should anticipate the possible presence of accumulated static electricity and take necessary precautions to minimize the potential hazards.
- Operations will be scheduled so that the last detonation will occur at least 1 hour prior to sunset.

- Use electric blasting caps of the same manufacture, if possible, for each demolition shot involving more than one cap.
- Keep blasting caps in approved containers at least 50 feet from other explosives.
- Do not strike, tamper with, or attempt to remove or investigate the contents of a blasting cap, detonator, or explosive initiating device. A detonation may occur.
- Do not pull on the lead wires of electric blasting caps, detonators, or other electro-explosive devices (EEDs). A detonation may occur.
- Do not bury blasting caps. Buried blasting caps are subject to unobserved forces and movement which could lead to premature firing or misfires.
- Review electromagnetic radiation (EMR) precautions and electrical grounding procedures as indicated in the applicable reference publications prior to commencing any electric demolition procedure.
- Do not transmit on a radio or use a cellular phone within the HERO distance specified on the specific transmitter (typically 25 feet).
- All disposal shots will be dual primed, whenever possible.
- Use only the minimum amount of explosives necessary to destroy the item(s) being detonated. In accordance with historical use, a self-imposed combined Net Explosive Weight (NEW) limit of 20 pounds will be used for all disposal operations.

8.2 ELECTRIC FIRING SAFETY PRECAUTIONS (REMOTE FIRING DEVICE)

The following "Electric Firing Safety Precautions" apply to all ordnance disposal work utilizing the RFD:

- The operating procedures contained in the RFD Operating Manual will be followed when using the RFD.
- Use only special silver chloride dry-cell batteries in the galvanometer. Other types of batteries may produce sufficient voltage to detonate blasting caps.
- Do not remove the shunt from the lead wires of blasting caps except to test continuity or connect into a firing circuit. The individual removing the shunt will ground himself/herself prior to this operation to prevent accumulated static electricity from firing the blasting cap.
- Unroll the lead wires so that the cap is as far as possible from the operator and pointing away from him. Place the blasting cap under a sand bag or behind a barricade before removing the shunt and testing for continuity. Make sure the cap is not pointing toward other personnel or explosives.
- Do not hold the blasting cap directly in the hand when uncoiling leads. Hold wires approximately 6 inches from the cap. The lead wires should be straightened by hand; not thrown, waved, or snapped to loosen the coils.

- Test electric blasting caps for continuity 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 wire together. The wires will remain shunted until they are to be connected to the firing circuit.
- Do not connect the blasting cap into the circuit unless the other end of the firing wire is shunted.
- Touch the shunted blasting cap wires to the shunted firing wires to equalize the electrical potential prior to connecting.
- Keep all parts of the firing circuit insulated from the ground or other conductors such as bare wires, rails, pipes, or other paths of stray current.
- Do not connect the RFD to the firing circuit until all pre-firing tests have been completed and the demolition charge is ready in all respects to be fired.
- Keep the power end of the firing wire shunted until ready to connect the RFD.
- Do not attempt to fire a single electric blasting cap or combination of electric blasting caps in a circuit with less than the minimum current required by the total circuit.

The Demolition Supervisor will order the firing wires to be connected to the RFD when he is certain the area is clear of personnel, animals and equipment.

9. OPERATIONS

9.1 PRE-DISPOSAL OPERATIONS

Prior to performing the MEC disposal field activities, the following actions will be completed:

- Identify the MEC item in consultation with the UXOSO and the SUXOS. The UXOSO and the SUXOS will implement the most appropriate response action that is protective of human health and the environment for the discovered item.
- Record the location of the MEC item and fill out the MEC information form in accordance with the site-specific work plan or incidental item report as appropriate.
- Identify the minimum safe distance/exclusion zones for essential and non-essential personnel for the disposal operation.
- Select the personnel to perform disposal operations involving MEC. The SUXOS will select personnel based on current qualifications and Bureau of Alcohol, Tobacco, Firearms and Explosives approval as an employee possessor. Ensure all personnel become familiar with this instruction and references. All personnel will follow the procedures outlined in this instruction and references when conducting demolition operations.
- Ensure all personnel participating in disposal operations involving the use of explosives and pyrotechnics are aware of the hazards associated with these devices.

- Notify all concerned agencies, local emergency services providers and the local community, as necessary.
  - Immediate Response BIP operation notifications will be made as soon as possible prior to the demolition activities with detonations typically occurring before 5:00 p.m.
  - Pre-planned demolition operations notifications will be made at least 4 calendar days prior to demolition activities with detonations typically occurring between 8:00 a.m. and 5:00 p.m.
- Monitor weather forecasts and notify the SUXOS whenever a hazardous weather condition exists or may develop. Demolition operations will not take place when any of the following conditions exist:
  - Electrical storms are predicted for the immediate area.
  - Lightning activity is observed visually within five miles.
  - Sand, snow or dust storms of sufficient severity to create static electric charges are within five miles.
  - During periods of low or heavy overcast with a wind velocity less than 5 knots.
  - During conditions when there is a high potential for fire (also referred to as red flag fire days) as determined by the UXOSO and SUXOS, unless fire prevention activities such as engineering controls, fuel reduction, pre-wetting, etc., can mitigate the hazard.
- Conduct UXO Demolition Operations Safety Briefings before the start of each disposal operation for all personnel participating in the disposal activities.
- Maintain a copy of this SOP instruction at the Field Operations Office. All personnel assigned to specified disposal activities will read this SOP and sign the required signature sheet.

9.2 INITIAL PREPARATIONS/RANGE PROCEDURES

Before each disposal operation, the SUXOS and the assigned work crew will inspect the disposal areas to identify any hazards not conducive to safe operations. Hazards are determined on a case-by-case basis and are dependent upon the location of the demolition operation. The work crew will stage all equipment provided by the SUXOS and other associated equipment and material necessary for operations to begin. The UXOSO will also ensure that all necessary vehicles and equipment are in compliance with State and Federal OSHA regulations.

9.2.1 UXOSO Pre-Operational Procedures

The UXOSO will conduct a Daily Safety Brief before each day's activities for all personnel participating in the open detonation/disposal operations. The UXOSO will also inspect each member of the team to ensure the following:

- No silk, wool, rayon, nylon, or other synthetic-fiber garments are worn (static electricity hazard).
- Leather palmed gloves are worn.
- Safety glasses with side shields (ANSI Z87.1 standard) are worn.
- All spark and flame producing materials are absent from the disposal site.

9.2.2 Demolition Supervisor Pre-Operational Procedures

The Demolition Supervisor will ensure the following actions are performed:

- Assign and post road guards as necessary
- Ensure the disposal operation site is secure.
- Announce "the range is hot, keep radio traffic to a minimum" over the radio whenever any explosive materials are brought onto the range area.
- Explosive materials will be drawn from the explosives safety locker (ESL) and stored in the quality control truck's magazines prior to demolition operations.
- Brief the demolition party on the sequence of events for each shot.
- Verify the area is secure and get permission from the UXOSO before any explosive procedures begin.

9.3 PROCEDURES FOR ELECTRIC INITIATION (REMOTE FIRING DEVICE)

The following actions, procedural steps, and precautions are provided for the electric initiation of explosive charges utilizing a RFD.

The Demolition Supervisor will:

- Control all initiators and blasting machines.
- Direct the preparation of all demolition charges.
- Ensure the engineering controls are ready to be put in place and the area is free of gravel, rocks, and other debris.
- Dual prime all initiating systems whenever possible.

- Direct the demolition party to proceed down range and place the prepared main charge.
- Direct the placement of engineering controls over the charge to ensure the mitigation of noise and fragmentation hazards to the surrounding public.
- Ensure compliance with all safety precautions and operating procedures contained in the RFD Operating Manual, when performing MEC disposal operations utilizing the RFD.
- Direct all members of the demolition party not involved in the actual blasting cap test/priming sequence to proceed to a safe area.
- Ensure that all personnel are accounted for and in a safe area and that the range exclusion zone is clear.
- Give the command to prime the demolition shot.
- Retire to the safe area.
- Direct one member of the crew to sound the air horn 60 seconds prior to giving three loud, clear "Fire in the Hole" in separate directions, allowing a brief delay prior to firing to allow for a possible response.
- Call for silence while the team member initiates the shot.
- Visually check the range after a five-minute wait, assuming a successful charge detonation.

ALL PERSONNEL WILL LISTEN FOR THE DETONATION AND, IF NECESSARY, START MISFIRE PROCEDURES.

9.4 MISFIRE PROCEDURES

9.4.1 General Misfire Procedures

In case of any type of “misfire”, the Demolition Supervisor will designate personnel to assist during misfire procedures. The Demolition Supervisor will:

- Ensure that all personnel remain in a safe area unless specifically assigned a “misfire” function.
- Designate a safety observer to move to a place as far as possible from the demolition site while still keeping the Demolition Supervisor in sight and be prepared to render assistance in case of an accident.
- Wait a minimum of thirty minutes after the expected detonation time before proceeding to the misfire for corrective action.
- Ensure all excess personnel remain in a safe area until the misfire procedures have been completed.

9.4.2 Electric Misfire Procedures (Remote Firing Device)

In the event of an electrical misfire, the misfire procedures listed in the RFD Operating Manual will be followed:

- On the transmitter, remove the safe-arm key card. The ARM LED will extinguish. Press and hold the transmitter ON/OFF touch pad until the ON LED is extinguished.
- Maintain a safe distance from the receiver for at least 60 minutes after the misfire.
- After 60 minutes have elapsed from the time of the misfire, approach the detonator/cap. Do not touch the RFD.
- Remove any sandbags or soil covering the detonator/cap and carefully detach the detonator/cap from the main explosive charge.
- Remove and short the electric wires from the RFD receiver.
- The RFD receiver may now be safely handled. Note the status of the ARM, ON, AND BATTERY LOW LED's before pressing the ON/OFF touch pad to turn the receiver power off.
- Follow the troubleshooting procedures in RFD Operating Manual Appendix B to determine the cause of the misfire.
- If the cause of the misfire can be determined, correct the problem, perform a test fire following the procedures in Section 4.3.1 of the RFD Operating Manual. If the cause of the misfire cannot be determined, use a different RFD receiver to perform a test fire following the procedures in Section 4.3.1 of the RFD Operating Manual, replace the detonator/cap and repeat the firing procedure in Section 4.3.2 of the RFD Operating Manual.

9.5 POST-DETONATION INSPECTION

Following each detonation, an inspection of the detonation pit and surrounding area will be accomplished to identify and remove any MEC fragments, unconsumed explosives, or other debris that may have originated from the detonation. Material suspected to contain explosives or explosive residues will be placed back in the detonation area and treated in a subsequent detonation on the same day. Debris that is free of energetic material will be segregated and managed in accordance with the site-specific work plan.

9.6 POST-OPERATIONAL REQUIREMENTS

The following actions are required for post-operational shutdown. The Demolition Supervisor will:

- Inform the SUXOS after the last detonation of the day and all explosive stores are depleted or prepared for return to the ESL – “Range is Cold” and “operations are complete."
- Inform road guards to allow normal traffic flow and return to previous assignment.
- Direct crew members to remove all trash and nonhazardous residue from the disposal area and deposit it in appropriate receptacles.
- Record the disposal of items and update the MEC information form and incidental finds forms, as appropriate.
- Inventory and replenish the Demolition Equipment Box.

Attachment 1
Form M-2
Explosive Demolition Operations

How Many Shots: _____

Size: _____ **Weight:** _____

Time of Shot: _____

Location: _____

Date: _____

AT LEAST 30 MINUTES PRIOR TO PLANNED DETONATION:

CALLED		**TIME**
Clark County PM	Jerry Barnett	360-566-6992
Clark County MSO	Greg Johnson	360-566-6993
Clark County Sherriff Dept	Dispatch	360-397-2211
Clark County Fire District 3	Dispatch	360-687-6968
Army BRAC Office		

5 Day Notifications: For highlighted agencies and emergency services (as applicable by jurisdiction).

Attachment 2
Workers Statement

☐ **I have read and understand this SOP.**

☐ **The procedures described in this instruction can be performed in a safe and effective manner without unnecessary risk to personnel, explosive or environmental safety.**

☐ **I verify that I am qualified and can perform all tasks that are assigned to me in accordance with this SOP.**

☐ **If deviation from this instruction is necessary for equipment, or personnel safety, I will personally stop the operation until the applicable procedure is reviewed by the SUXOS and revised if necessary.**

☐ **If unexpected safety, health, or environmental hazards are encountered independent of these procedures, I will stop the evolution until the hazard(s) have been eliminated.**

Worker's Name	Signature	Date

SOP - 22
POST-BLOW-IN-PLACE SAMPLING
7-SAMPLE WHEEL APPROACH
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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Figure 1 7-Wheel Sampling Approach

1. SCOPE AND APPLICABILITY

Instructions presented in this Standard Operating Procedure (SOP) are for collecting post-blow-in-place (post-BIP) soil samples. Instructions for surface soil sampling included in this section utilize the 7-Sample Wheel approach.

The purpose of this post-BIP sampling program is to collect and analyze representative post-detonation soil samples for all UXO items that are BIP to confirm that any residual detectable munitions constituents (MC) [e.g., 2,4,6-trinitrotoluene (TNT)] concentrations are within acceptable levels following high-order detonation events.

2. EQUIPMENT

- Field logbook
- Clipboard
- Folding rule (in feet and tenths)
- Paper towels
- Pens (blue or black)
- Eye protection
- Work gloves
- Surgical gloves
- Sample jars
- Sample jar labels
- Chain-of-custody forms
- Appropriate sampling device

3. RELATED PROCEDURES

- SOP Field Documentation
- SOP Field Sample Numbering
- SOP Quality Assurance/Quality Control Sampling
- SOP Decontamination (if disposable equipment is not utilized)
- SOP Management of Investigation Derived Waste (IDW)
- SOP Sample Chain-of-Custody

- SOP MEC Anomaly Avoidance

4. PROCEDURE

4.1 SAMPLING LOCATIONS

Sampling will be conducted at locations where discovered UXO items are detonated in-place (i.e., post-BIP).

4.2 SAMPLE TYPES

Post-BIP soil samples will consist of a composite sample based on the Cold Regions Research Engineering Laboratory (CRREL) 7-Sample Wheel approach (as described in CRREL Special Report (SR) 96-15, Assessment of Sampling Error Associated with Collection and Analysis of Soil Samples at Explosives-Contaminated Sites). Composite samples are composed of two or more specific aliquots (discrete [grab] samples) collected at various sampling locations as described in Section 4.3.

4.3 7-SAMPLE WHEEL APPROACH

The 7-Sample Wheel approach obtains seven grab samples within the wheel (see Figure 1) and combines them together. Typically the portions used to make the composite are not individually weighed; however, they should be approximately equal in weight. Each grab samples will be combined in a disposable aluminum container, all foreign matter will be logged and removed with a sterile gloved hand, and then the samples will be thoroughly homogenized to form one composite sample. The complete procedures to establish a composite sample from the seven samples are detailed on page 4 of CRREL SR 96-15. Each of the grab samples will be collected from a depth of 0 to 12 inches below ground surface (bgs) using a disposable scoop or similar equipment.

Each incremental sampling location will be cleared of foreign matter (i.e., scrap metal, rocks, etc.). New scoops and gloves will be used at each sampling location. Each collected grab sample from the “wheel” will be placed along with the other grab samples in a disposable aluminum container and homogenized with a disposable scoop.

Material in the disposable aluminum container will be transferred with a new disposable scoop into the appropriate sample containers. Sample containers will be filled to the top, taking care to prevent soil from remaining in the lid threads prior to being closed to prevent potential contaminant migration to or from the sample. Sample containers will be closed as soon as they are filled, placed in an ice chest chilled to 4 degrees Celsius ($^{\circ}$C), and processed for shipment to the laboratory. All field personnel will wear clean disposable nitrile gloves when collecting samples to avoid cross-contamination.

The sample will be thoroughly mixed using the following procedures:

- Roll the soil to the middle of the compositing container and mix.
- Quarter the sample and move to the sides of the container.
- Mix each quarter individually and roll to the middle of the compositing container.
- Mix the sample once more, composite quarter sub-samples, and place in laboratory sample container.

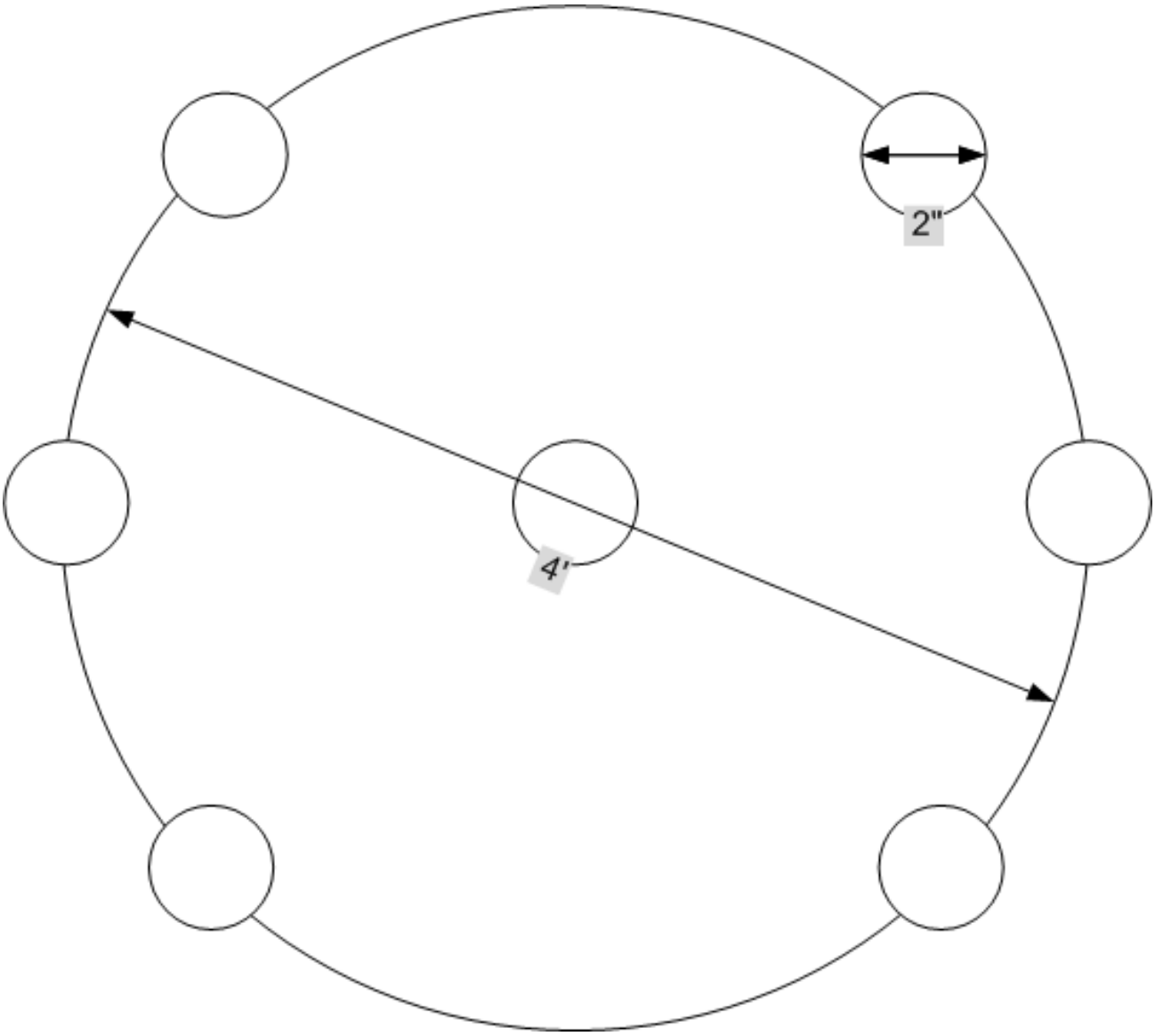
New disposable plastic scoops and aluminum containers will be used at each sample location.

Horizontal coordinates for each of the sampling locations will be surveyed in the field.

5. REFERENCES

ERDC (Engineer Research and Development Center)/CRREL (Cold Regions Research Engineering Laboratory) Special Report (SR) 96-15, Jenkins, Thomas F., et. al. (1996). Assessment of Sampling Error Associated with Collection and Analysis of Soil Samples at Explosives-Contaminated Sites. http://www.crrel.usace.army.mil/library/specialreports/SR96_15.pdf

Figure 1
7-Wheel Sampling Approach



SOP - 23
QUALITY ASSURANCE/QUALITY CONTROL SAMPLING
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICATION

Quality assurance/quality control (QA/QC) measures are those activities undertaken to demonstrate the accuracy (how close to the true value the results are) and precision (how reproducible the results are) in monitoring. QA generally refers to a broad plan for maintaining quality in all aspects of a program. QC consists of the steps taken to determine the validity of specific sampling and analytical procedures. Quality assessment is the assessment of the overall precision and accuracy of the data, after it is analyzed.

2. EQUIPMENT

- American Society for Testing and Materials (ASTM) Type II reagent-grade water

3. RELATED PROCEDURES

- SOP Field Documentation
- SOP Field Sample Numbering
- SOP Sample Chain-of-Custody

4. PROCEDURES

4.1 FIELD DUPLICATES

For each sampling round, one duplicate sample is collected for every 10 routine samples. These duplicate samples are taken immediately following the collection of the samples. They are intended to duplicate the routine sample collected. Soil duplicates from split spoons will be collected by splitting the soil in the spoon lengthwise and dividing the soil into the standard and duplicate containers. Soil and sediment field duplicate samples for organics other than volatiles are thoroughly homogenized and then transferred into their appropriate sample containers before shipment to the analytical laboratory. A note needs to be made in the appropriate field logbook indicating that a duplicate sample was collected, and describing how it was collected. Duplicates will be handled in the same manner as all other samples.

SOP, Field Sample Numbering, identifies the numbering scheme.

4.2 EQUIPMENT BLANKS

Equipment blank samples are collected daily and analyzed to determine the effectiveness of decontamination practices. Equipment blanks (also called rinse or rinsate blanks) are collected at a frequency of 5 to 10% of samples. If fewer than 20 samples are collected in a day, 1 equipment blank sample will be collected. Equipment blank samples are collected as follows:

- Sample bottles for equipment blanks are of the same type as routine sample bottles and will be prepared prior to sampling.
- Pour ASTM Type II reagent-grade water over and/or into the decontaminated sampling equipment. Then pour the water from the sampling equipment into the equipment blank sample jars.
- After all bottles are filled, label the sampling equipment with the associated routine sample ID number and use that sampling equipment to collect the environmental sample at that particular sampling location.
- Note in the field logbook that an equipment blank was collected for that particular sampling location.

Once collected, handle equipment blank samples in the same manner as routine samples.

4.3 TRIP BLANKS

The purpose of a trip blank sample is to determine whether factors during transport may have affected the sample quality of volatile organic compounds (VOCs).

A trip blank prepared in the laboratory or field consists of two VOC sample bottles filled with ASTM Type II reagent grade water. Trip blanks will be obtained the morning prior to sampling and will accompany the associated routine sample bottles in the same cooler. When the day of sampling is completed, the trip blanks will be handled in the same manner as routine samples and returned to the laboratory. Trip blanks will be collected at a frequency of 1 per day of VOC sample shipment. A note should be made in the field logbook that a trip blank accompanied the particular samples.

4.4 MS/MSD SAMPLES

Matrix spike/matrix spike duplicate (MS/MSD) samples are collected for the laboratory to perform internal QC checks. MS/MSD sampling involves collection of triple the volume of a

routine surface water or groundwater sample. No additional volume is required for soil. MS/MSD samples are collected at a rate of 1 for every 20 samples. They are collected as separate samples immediately after the collection of the routine samples for the same parameter. The sample collection procedure is as follows:

- Additional bottles will be prepared the first day so the sampling teams will be ready to sample. For example, a routine sample for polychlorinated biphenyls (PCBs) requires two 1-liter amber glass bottles. An MS/MSD sample for PCBs requires six 1-liter amber glass bottles.
- Note in the field logbook that an MS/MSD sample was collected at that particular location. Once collected, handle samples in the same manner as routine samples.

The MS/MSD samples are identified using the standard nomenclature as outlined in SOP Field Sample Numbering, with the designation of MS/MSD on the chain-of-custody form and on the sample containers. Chain-of-custody procedures are presented in the SOP.

SOP - 24
SOIL SAMPLING
CAMP BONNEVILLE

Approved by:

_____ _____

Technical Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICABILITY

Instructions presented in this Standard Operating Procedure (SOP) are for collecting representative soil samples. Soil sampling can be classified into two primary types: surficial and subsurface. Instructions for sampling surficial soil included in this section utilize the spade and scoop. Instructions for sampling subsurface soil will not be addressed in this section.

2. EQUIPMENT

- Field logbook
- Muncell color chart
- Grain size card
- Hand lens
- Clipboard
- Folding rule (in feet and tenths)
- Pocket penetrometer (if required)
- Indelible ink markers
- Squirt bottle (with deionized water)
- Plastic sheeting
- Paper towels
- Pens (blue or black)
- Eye protection
- Work gloves
- Surgical gloves
- Sample jars
- Sample jar labels
- Chain-of-custody forms
- Photoionization detector (PID)
- Decontamination materials
- Appropriate sampling device

3. RELATED PROCEDURES

- SOP Field Documentation

- SOP Field Sample Numbering
- SOP Quality Assurance/Quality Control Sampling
- SOP Decontamination
- SOP Management of Investigation Derived Waste (IDW)
- SOP Sample Chain-of-Custody
- SOP Surveying
- SOP MEC Anomaly Avoidance
- SOP Monitoring of dust generating activities

4. PROCEDURE

4.1 SAMPLING LOCATIONS

Sampling at sites is usually conducted in an attempt to discover contamination and to define its extent and variability. With such an objective, it is most logical to choose sample locations that will yield the most information about site conditions. Because of the nature of the media, soil samples can vary considerably across a site. Physical properties of the soil, including grain size and cohesiveness, may limit the depth from which samples can be collected and the method required to collect them. In most soil, hand-powered equipment can be used only to a depth of approximately 4 to 5 feet. At greater depths, soil sampling is normally performed with a drill rig or other mechanically driven device.

4.2 SAMPLE TYPES

The type of sample should be designated when selecting a sampling method. Application techniques for sample methods include discrete (grab) or composite samples. A discrete (grab) sample is defined as a discrete aliquot representative of a specific location at a given point in time. The sample is collected immediately and at one particular point in the sample matrix. The representativeness of such samples is defined by the nature of the materials being sampled. In general, as sources vary over time and distance, the representativeness of grab samples will decrease. Composites are samples composed of two or more specific aliquots (discrete samples) collected at various sampling locations and/or different points in time. Analysis of this type of sample produces an average value and can, in certain instances, be used as an alternative to analyzing a number of individual grab samples and calculating an average value. It should be

noted, however, that compositing can mask the presence of contaminants by diluting isolated concentrations of analytes that may be present in the environmental matrix.

4.3 SAMPLE COLLECTION

Each sampling technique presents various advantages and disadvantages for its application. For example, sample disturbance, sample volume, chemical/physical reactivity between potential contaminants and sampling tool materials, and ease of decontamination vary from technique to technique. Subsurface soil conditions themselves will restrict the application of certain samples. For example, the thin-walled tube sampler is not applicable for sampling sands.

Presented below are sampling instructions for the most common techniques of collecting soil samples. Prior to sample collection, the soil sampling location and characteristics (e.g., soil type, depth) should be recorded in the field logbook. Selection of soil sampling equipment is usually based on the depth of the samples. Manual techniques are usually selected for surface or shallow subsurface soil sampling. At greater depths, mechanically driven equipment is usually required to overcome torque induced by soil resistance and depth.

4.3.1 Surficial Sampling

Spade and Scoop

The spade and scoop method is a very accurate, representative method for collecting surface and shallow subsurface soil samples. This method is usually limited to soil depths less than 1-foot.

Method Summary and Equipment

The simplest, most direct method of collecting surface soil samples is to use a spade and stainless steel scoop. A typical garden spade can be used to remove the top cover of soil to the required depth, and the smaller stainless steel scoop can be used to collect the sample.

Sampling Procedure

- Place plastic sheeting on the ground around the sampling location to prevent cross-contamination.
- Carefully remove the top layer of soil to the desired sample depth with a pre-cleaned or decontaminated spade.

- Using a pre-cleaned or decontaminated stainless steel scoop or trowel, collect the sample aliquot for volatile organic compound (VOC) analysis first (if applicable), then homogenize enough soil in a stainless steel bowl for the remaining sample containers.
- Transfer sample into the appropriate sample bottle with a stainless steel laboratory spoon or equivalent.
- Remove any soil clinging to the bottle threads or rim, and secure the cap tightly.
- Label the sample bottle with the appropriate sample label. Complete the label carefully and clearly, addressing all the categories or parameters.
- Place filled sample containers on ice immediately.
- Complete all chain-of-custody documents and record in the field.
- Prepare samples for shipping.
- Decontaminate sampling equipment after use.

4.4 FIELD MEASUREMENT PROCEDURES

The purpose of this section is to identify methods for field screening soil. Visual assessment and instrument readings will be used to screen field samples and residual samples. Residual materials may include excess samples, cuttings, and other materials.

4.4.1 Preparation

- Review screening procedures and equipment operation manuals.
- Calibrate field screening instruments in accordance with the manufacturer's instructions and operating procedures.
- Document calibrations in the field logbook.
- Determine the ambient air temperature. If the ambient air temperature is below 15 $^{\circ}$C, select an area where soil samples can be kept warm for head space readings.

4.4.2 Field Screening

Prior to and during collection of a soil or sediment sample, visually observe the sampling area, and sample for signs of releases that include the following:

- Surface discoloration or staining.
- Stressed or discolored vegetation.
- Physical evidence of hydrocarbons or other contamination.

Record visual observations of the sampling area in the field logbook. Include a sketch and dimensions of any area where visual signs of a release are observed.

4.4.3 Instrument Readings

Take instrument readings prior to sampling to monitor ambient air for health and safety purposes. Record this information in the field logbook.

Soil and/or sediment headspace readings are taken in the following manner:

- Place soil/sediment sample in a clean, dry, glass jar so that the jar is not more than half full. Cover the jar with aluminum foil and replace the lid.
- If the ambient temperature is low, bring the jarred samples to an area where they can be warmed.
- Gently shake the jar to aid sample volatilization.
- Remove the lid and insert the probe through the aluminum foil, but not into the sample since this will clog the instrument. Record the instrument reading of the area on the log reserved for headspace readings.
- Do not submit the jarred sample for laboratory analysis.
- Dispose of the jarred sample in accordance with residual management protocols.

4.5 SOIL SAMPLING FOR VOLATILE ORGANIC COMPOUNDS

4.5.1 EnCore™ Sampler

The EnCore Sampler has been approved for collection of samples, and this method is the preferred sampling method for use at the site. The EnCore Sampler (or equivalent) selects a small volume (about 5 grams) of soil that is stored in a chamber that is submitted to the analytical laboratory. *The sample must be received, prepped, and analyzed within 2 days of collection; therefore, all samples must be shipped the day they are collected.*

Two or three EnCore samplers will be required per analytical sample:

- One EnCore sampler for low-concentration analysis.
- One EnCore sampler for high-concentration analysis or low-concentration duplication.
- One EnCore sampler for repreparation.
- One volatile organic analyte (VOA) jar with Teflon cap for moisture determination.

The EnCore Sampler is a single use device. It cannot be cleaned and/or reused. The following is the procedure for using the EnCore Sampler:

- Hold the coring body and push the plunger rod down until the small o-ring rests against the tabs. This will ensure that the plunger moves freely.
- Depress the locking lever on the EnCore T-Handle. Place the coring body, plunger end first, into the open end of the T-Handle, aligning the two slots on the coring body with the two locking pins in the T-Handle.
- Twist the coring body clockwise to lock the pins in the slots. Check to ensure the sampler is locked in place. The sampler is now ready for use.
- Turn the T-Handle with the T up and the coring body down. This positions the plunger bottom flush with the bottom of the coring body (ensure that the plunger bottom is in position).
- Using the T-Handle, push the sampler into the soil until the coring body is completely filled. When full, the small o-ring will be centered in the T-Handle viewing hole.
- Remove the sampler from the soil and wipe any excess soil from the exterior of the coring body.
- Place a cap on the coring body while it is still in the T-Handle. Push and twist the cap over the bottom until the grooves on the locking arms seat over the ridge on the coring body. The cap must be seated to seal the sampler.
- Remove the capped sampler by depressing the locking lever on the T-Handle while twisting and pulling the sampler from the T-Handle.
- Lock the plunger by rotating the extended plunger rod fully counter-clockwise until the wings rest firmly against the tabs.
- Attach a completed circular label from the EnCore Sampler bag to the cap on the coring body.
- Complete the outside label on the EnCore Sampler bag and add a custody seal.
- Return the full EnCore Sampler to a resealable plastic bag. Seal the bag and place on ice.

It should be noted that EnCore Samplers can be used for all soil sampling activities, i.e., surface soil, sediment, etc., by sub-sampling the sampling device (e.g., shovel, coring device, split spoon). In a soil matrix that is noncohesive, the EnCore Sampler's plunger can be retracted, filled with the required sample volume, and then capped.

5. REFERENCES

ASTM Standard D4700. 2006. “Standard Guide for Soil Sampling from the Vadose Zone.” ASTM International, West Conshohocken, PA. 2006, DOI: 10.1520/D4700-91R06. www.astm.org. (Accessed 24 February 2010).

ASTM Standard D3550. 2007. “Standard Practice for Thick Wall, Ring-Lined, Split Barrel, Drive Sampling of Soils.” ASTM International, West Conshohocken, PA. 2007, DOI: 10.1520/D3550-01R07. www.astm.org. (Accessed 24 February 2010).

ASTM Standard D1452. 2009. “Standard Practice for Soil Exploration and Sampling by Auger Borings.” ASTM International, West Conshohocken, PA. 2009, DOI: 10.1520/D1452-09. www.astm.org. (Accessed 24 February 2010).

ASTM Standard D1586. 2008. “Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils.” ASTM International, West Conshohocken, PA. 2008, DOI: 10.1520/D1586-08a. www.astm.org. (Accessed 24 February 2010).

ASTM Standard D1587. 2008. “Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes.” ASTM International, West Conshohocken, PA. 2008, DOI: 10.1520/D1587-00R07E01. www.astm.org. (Accessed 24 February 2010).

SOP - 25
FIELD SAMPLE NUMBERING
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICATION

The objective of this Standard Operating Procedure (SOP) is to define the method for assigning field sample identifiers (IDs), which will be used on sample containers, field logbooks, and/or field data collection sheets. The purpose of the field sample IDs is to provide additional information about the sample to end users of the data. It is expected that this approach will add supplemental value for users who are evaluating data in tabular form, without the benefit of any other spatial reference.

Sample labels are required to properly identify samples and evidence. All samples must be properly labeled with the label affixed to the container prior to transportation to the laboratory.

In order to provide additional information in the sample ID, a set of requirements and guidance has been prepared to assist the data users in the execution of a scheme for building intelligence into the sample nomenclature. A field sample ID protocol has been implemented since the inception of the sampling program in June 1999. The mechanisms for recording the field sample ID are the Sample Attribute Form, the field logbook or data collection sheet, the sample container label, and the chain-of-custody forms.

Over time, edits, deletions, and additions have been made to the field sample ID to respond to feedback and comments provided by the client and the field teams. The original field sample ID had a simple format indicating date of sample collection, sampling team, and sample sequence. The original field sample ID was deemed inadequate for present and future needs, and the ID was modified to incorporate additional sample attribute information. The new field sample ID includes site, location, quality control (QC) type, and depth or date of sample collection. From a data management perspective, the key requirement for the field sample ID is that it represents a unique name. The field sample ID and its corresponding attribute information will be captured electronically and linked within the project database.

Information on sample labels should be limited to the following:

- Field Sample ID—Each sample, including field control samples, collected for a project should be assigned a unique character name (see below).
- Samplers—Each sampler's name and signature or initials.

- Preservative—Whether a preservative is used and the type of preservative.
- Analysis—The type of analysis requested.
- Date/Time—The date and time the sample was taken.
- Type of Sample—The sample identified as either discrete or composite.

2. EQUIPMENT

- Sample labels
- Pen with indelible ink
- Sample Attribute Forms

3. RELATED PROCEDURES

- SOP Field Documentation
- SOP Chain-of-Custody

4. PROCEDURE

4.1 FIELD SAMPLE ID

The environmental and associated QC samples collected during the field investigation will be labeled with a sample ID number. The sample numbers will be recorded in the site logbook, the chain-of-custody, and the shipment documents in accordance with relevant SOPs.

The sample ID will be composed of three components:

[_ _] [_ _] [_ _]

1 2 3

Component 1—Defines the site location using a predetermined identifier:

FIGR01 = FIG Ricochet Area MRS (FTIG-003-R-01)

Component 2—Defines the sample matrix and sample number:

SS## = surface soil sample

SB1## = subsurface soil sample 6 to 12 in

SB2## = subsurface soil sample 12 to 18 in

SB3## = subsurface soil sample 18 to 24 in

SD## = sediment sample

Component 3—Defines the QA sample type:

00 = Background Sample

01 = Environmental Sample

02 = Duplicate sample

03 = Temperature blank

04 = Matrix spike

05 = Matrix spike duplicate

An example of typical sample ID nomenclature is FIGR01-SS01-01. The “FIGR01” indicates a sample collected from the Ricochet Area MRS. The “SS” indicates the sample is a surface soil sample (0 to 6 in bgs) at location number 01. The “01” indicates that the sample is an environmental sample.

SOP - 26
SAMPLE CHAIN-OF-CUSTODY
CAMP BONNEVILLE

Approved by:

MEC Response & Removal Task Manager	Date
Project Manager	Date

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Figure 1 Chain-of-Custody Form

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Figure 3 Jar/Bottle Label

1. SCOPE AND APPLICATION

Chain-of-custody (COC) records provide documentation of the handling of each sample. Sample custody will be initiated by Weston Solutions, Inc. (WESTON) upon collection of samples and maintained until samples are relinquished to the shipping carrier for delivery to the laboratory. COC forms will be placed in waterproof plastic bags and taped to the inside lid of the cooler. The cooler will be sealed with COC seals. COC forms will be used for recording pertinent information about the types and numbers of samples collected and shipped for analysis. Sample identification numbers will be included on the COC form to ensure that no error in identification is made during shipment.

2. EQUIPMENT

- COC forms
- Waterproof plastic resealable bags
- COC seals
- Labels
- Pen
- Markers
- Tape
- Scissors

3. RELATED PROCEDURES

- SOP Field Documentation
- SOP Field Sample Numbering
- SOP Sample Packing and Shipping

4. DOCUMENTATION

4.1 CHAIN-OF-CUSTODY RECORDS

COC procedures provide documentation of the handling of each sample. COC procedures are implemented so that a record of sample collection, transfer of samples between personnel,

sample shipping, and receipt by the laboratory that will analyze the sample is maintained. The COC record serves as a legal record of possession of the sample. The COC record is initiated with the acquisition of the sample. The COC record remains with the sample at all times and bears the name of the person (field investigator) assuming responsibility for the samples. The field investigator is tasked with ensuring secure and appropriate handling of the bottles and samples. To simplify the COC record and eliminate potential litigation problems, as few people as possible should handle the sample or physical evidence during the investigation. A sample is considered to be under custody if one or more of the following criteria are met:

- The sample is in the sampler's possession.
- The sample is in the sampler's view after being in possession.
- The sample was in the sampler's possession and then was locked up to prevent tampering.
- The sample is in a designated secure area.

4.1.1 Transfer of Custody and Shipment

All sample sets should be accompanied by a COC record (Figure 1). This form records each sample and the individuals responsible for sample collection, transfer, shipment, and receipt by the laboratory. The form must also contain pertinent information about the sampling location, date, and times, signature of sampling technician, types and numbers of samples collected and shipped for analysis in each lot and the project name.

Samples shall be accompanied by an approved and completed COC form during each step of custody, transfer, and shipment. When physical possession of samples is transferred, both the individual relinquishing the samples and the individual receiving the samples should sign, date, and note the time that he/she received the samples on the COC record. This COC record documents transfer of custody of samples from the field investigator to another person, other laboratories, or other organizational units.

Samples sent off-site for analysis must be properly packaged for shipment, and delivered or shipped to the designated laboratory for analyses. Shipping containers must be secured by using nylon strapping tape and custody seals (see Section 4.2). The custody seals must be placed on the

container so that it cannot be opened without breaking the seals. The seal must be signed and dated by the field investigator.

When previously collected samples are split with a facility, state regulatory agency, or other government agency, the agency representative must sign the COC record, if present. All samples should be accompanied by a COC record. The original of the COC record will be placed in a plastic bag taped to the inside lid of the secured shipping container and transmitted to the laboratory along with the samples. One copy of the record will be retained by the field investigator or project leader. This copy will become a part of the project file. If sent by mail, the package should be registered with return receipt requested. If sent by common carrier, an air bill should be used. Receipts from post offices and air bills should be retained. The air bill number or registered mail serial number should be recorded in the remarks section of the COC record.

4.2 CHAIN-OF-CUSTODY SEALS

The COC seal is an adhesive seal placed in areas such that if a sealed container is opened, the seal would be broken (Figure 2). The COC seal ensures that no sample tampering occurred between the field and the laboratory analysis.

These signed and dated seals will be placed at the junction between the lid and the jar and on the cooler by the person responsible for packaging. If the coolers or jars are opened before receipt at the laboratory, the seals will not be intact. If the COC seals are not intact, the Laboratory Project Manager will notify the WESTON Analytical Manager within 24 hours of receipt of the container. The WESTON Analytical Manager will then follow the corrective action procedures.

4.3 SAMPLE LABELS

Every sample container will receive a label. Labels (Figure 3) will be completed using waterproof ink and will include the following information:

- Project name.
- Unique sample number.
- Sampling date and time.
- Initials of sampler.

- Sample media (soil, groundwater, etc.).
- Sample collection method (grab or filtered/unfiltered for groundwater).
- Analysis requested/chemical analysis parameters (analytes and EPA SW-846 method number).
- Method of sample preservation/conditioning.
- Remarks (such as photoionization detector readings) are useful.

4.4 POTENTIAL PROBLEMS

Although most sample labels are made with water-resistant paper and are filled out using waterproof ink, inclement weather and general field conditions can affect the legibility of sample labels. It is recommended that, after sample labels are filled out and affixed to the sample container, the container be placed in a plastic resealable bag. This will preserve the label, keep it from becoming illegible, and if the label falls off, the identification of the sample will still be known. In addition to label protection, COC and analysis request forms should also be protected when samples are shipped in iced coolers. Typically, these forms should be placed inside a plastic resealable bag or similar waterproof protection and taped to the inside lid of the secured shipping container with the samples.

5. CORRECTIONS

If an error is made, a single line should be drawn through the entry, and the entry initialed and dated. The erroneous information should not be obliterated. Any errors found in documentation should be corrected by the person who made the entry.

Figure 1
Chain-of-Custody Form

Chain of Custody Record

WESTON SOLUTIONS
Restoring Resource Efficiency

Client _____ Contact Name _____
Site Name _____ Contact Phone No. _____
W.O. _____ Turn-around-Time _____
Laboratory _____ Sampler _____

Analysis Requested by Group by Container
(number listed for total containers per analysis group)

Preservative

Lab Batch Number:

Lab ID	Sample ID	Matrix QC MS	Matrix QC MSD	Matrix QC DUP	Total Num of Containers	Matrix	Date Collected	Sample Time	App.IX VOA	Total PCBs by Aroclors	Homologs	Congeners		Herbicide	Dioxin/Furan	Appx. IX Metals	CN	Sulfide	TOC	Grain Size	Method TO-4 (Air)				

Field Remarks/Comments

Lab Use Only

Temp of Cooler when Received, C°

1	2	3	4

COC Tape was present on outer package	Y	N	
COC Tape was unbroken on outer package	Y	N	
COC Tape was present on sample	Y	N	
COC Tape was unbroken on sample	Y	N	
Received in good condition	Y	N	
Labels Indicate Properly Preserved	Y	N	
Received within Holding Time	Y	N	

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time

Page 1 of 1

Figure 2
Chain-of-Custody Seal

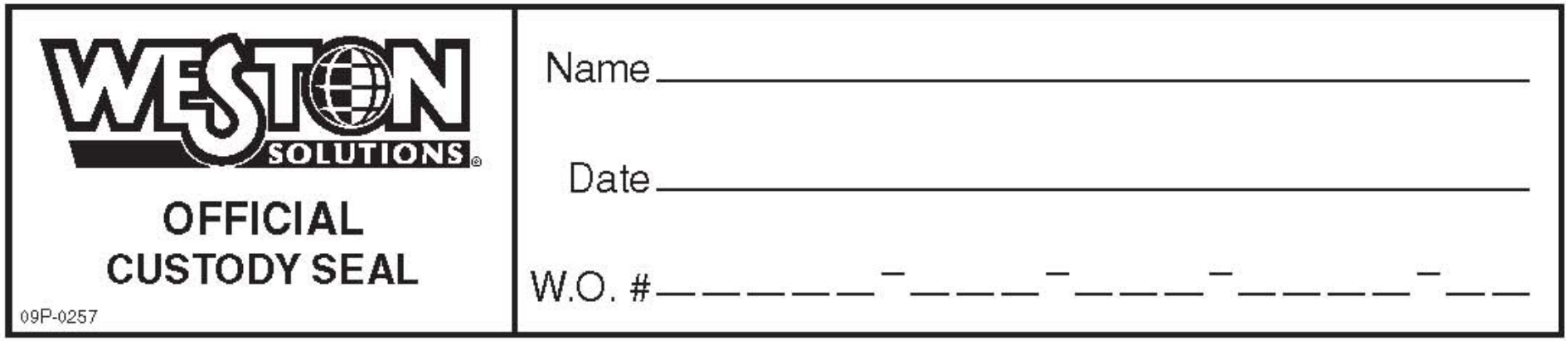

Figure 3
Jar/Bottle Label

<table>
<tr><td colspan="2">  </td></tr>
<tr><td colspan="2">PROJECT NAME</td></tr>
<tr><td>SAMPLE ID</td><td>SAMPLE DATE</td></tr>
<tr><td>SAMPLED BY</td><td>SAMPLE TIME</td></tr>
<tr><td>SAMPLE MEDIA</td><td>REMARKS</td></tr>
<tr><td>PRESERVATIVE</td><td>____GRAB
____COMPOSITE</td></tr>
<tr><td colspan="2">ANALYSIS REQUESTED</td></tr>
</table>

SOP - 27
SAMPLE PACKING AND SHIPPING
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICATION

This section describes procedures for properly packaging and shipping environmental and/or hazardous material samples. The procedures described in this section are performed after samples have been collected and placed in the proper containers and correctly preserved. The person overseeing sample shipping is required to have current certification in the Shipping and Transporting Dangerous Goods Course.

2. EQUIPMENT

- Chain-of-custody
- Custody seals
- Fiber strapping tape
- Ice
- Waterproof cooler
- Plastic resealable bags
- Paper towels
- Bubble wrap, vermiculite, “peanuts” or other inert packing material
- Air bills
- Up arrows
- Dangerous Goods Shipping Paperwork (if applicable)

3. RELATED PROCEDURES

- SOP Sample Chain-of-Custody

4. PROCEDURE

4.1 ENVIRONMENTAL SAMPLES

Environmental samples are defined as those samples collected from environmental matrices (that are known or expected to be non-contaminated) such as soil, groundwater, or sediments that are being shipped for further testing. Environmental samples should be packaged for shipment as follows (refer to Weston Solutions, Inc.’s (WESTON) Manual of Procedures for Shipping and Transporting Dangerous Goods (WESTON, 2009) for additional information as necessary):

1. The sample container is checked to determine if it is adequately identified, and sample labels are compared to chain-of-custody.
2. All bottles are checked to ensure that the contents are secured.
3. A waterproof cooler (such as a Coleman or other sturdy cooler comprised of metal or equivalent strength material) is typically used as a shipping container. In preparation for shipping samples, if the cooler has a drain plug, the drain plug is taped shut from the outside. Approximately 3 inches of inert packing material, such as bubble wrap, asbestos-free vermiculite, perlite, or styrofoam beads or "peanuts," is placed in the bottom of the container. Vermiculite is not to be used when analyzing for trace metals.
4. The bottles are placed upright in the cooler in such a way that they do not touch and will not touch during shipment. Bubble wrap or cardboard separators may be placed between the bottles at the discretion of the shipper.
5. All samples should be shipped to the laboratory on ice and chilled to 4 °C, except for the geotechnical and other samples that do not require shipment with ice. A temperature blank should be placed in the cooler so that it can be easily found by the laboratory when the cooler is first opened upon receipt.
6. Additional inert packing material is placed in the cooler to partially cover the sample bottles (more than halfway), to ensure they do not shift during transport. If samples are required to be shipped to the laboratory with ice, ice must be double bagged and placed around, among, and on top of the sample bottles. The cooler should then be filled with ice or inert packing material to prevent shifting and breakage of the contents.
7. The paperwork going to the laboratory is placed inside a plastic bag. The bag is sealed and taped to the inside of the cooler lid. The chain-of-custody form is included in the paperwork sent to the laboratory. The air bill must be filled out before the samples are handed over to the carrier. The contract laboratory should be notified by telephone of the shipment along with the estimated time of arrival. If another sample is being sent to another laboratory for analysis (such as dioxin), or if the shipper suspects that the sample contains any other substance that would require laboratory personnel to take additional safety precautions, the individual laboratory must be notified. Also, be sure to discuss with the appropriate laboratory whether samples will be accepted by the laboratory on Saturday. If the laboratory isn't open on Saturdays, one either couldn't sample on Friday or would have to drive the samples to the laboratory so that they were received by the laboratory before closing.
8. The cooler is closed and taped shut with strapping tape (filament-type).
9. Custody seals are placed on the cooler. Additional seals may be used if the sampler or shipper thinks more seals are necessary.
10. The cooler is handed over to the overnight carrier. A standard air bill is necessary for shipping environmental samples. The shipper should be aware of carrier weight or other policy limitations. "Environmental Samples" may be included on the air bill to indicate the nature of the goods. Be sure to affix "Saturday Delivery" stickers on the cooler and select the "Saturday Delivery" check box on the carrier air bill.

4.2 HAZARDOUS SAMPLES

Hazardous samples are defined as those that are known to or suspected to contain contaminated materials and typically include, but are not limited to, oils (liquid nonaqueous phase liquid (LNAPL) and dense nonaqueous phase liquid (DNAPL)), sludges, discarded products, source area samples, and waste profile samples. Hazardous samples must be packaged according to International Air Transport Association (IATA) regulations for air transportation and/or U.S. Department of Transportation (DOT) regulations for ground carrier shipments. Personnel with required duties pertaining to the shipment of hazardous samples and/or other dangerous goods including packaging and/or paperwork preparation will have completed required training as specified by IATA/DOT regulations. At a minimum, employees will have completed WESTON's Function-Specific Shipping and Transporting Dangerous Goods training course with required refresher training every 2 years.

In accordance with current IATA and DOT regulations, WESTON has prepared a Manual of Procedures for Shipping and Transporting Dangerous Goods to instruct employees on the shipment of routine hazardous samples and dangerous goods. Only those employees that have completed the aforementioned training course are qualified to prepare shipments of dangerous goods in accordance with the provisions provided in the Manual of Procedures for Shipping and Transporting Dangerous Goods. For shipments not considered to be routine and not covered by the manual, a Dangerous Goods Shipping Advisor within WESTON will be contacted for assistance. Dangerous Goods Shipping Advisors have completed initial (24-hour) and refresher training (16-hour) at IATA- and DOT-endorsed training facilities.

Sample shipments that may contain hazardous constituents must be evaluated and comply with instructions within WESTON's Manual of Procedures for Shipping and Transporting Dangerous Goods.

5. REFERENCES

CFR (Code of Federal Regulations). 49 CFR, Subtitle B, Other Regulations Relating to Transportation, Chapter I, Pipeline and Hazardous Materials Safety Administration, Department of Transportation, Parts 100–185.

IATA (International Air Transport Association). 2009. Dangerous Goods Regulations. 50th Edition. Effective from 1 January 2009 through 31 December 2009.

WESTON. 2009. Manual of Procedures for Shipping and Transporting Dangerous Goods.

SOP - 28
MANAGEMENT OF INVESTIGATION DERIVED WASTE (IDW)
CAMP BONNEVILLE

Approved by:

_____ _____

MEC Response & Removal Task Manager Date

_____ _____

Project Manager Date

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1. SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to describe the requirements for investigation derived waste (IDW) management. The requirements of these procedures are applicable to management for wastes generated as a result of field sampling and characterization activities and not yet characterized by laboratory analysis as hazardous or non-hazardous wastes. The goal of IDW management is to minimize the amount of waste generated while following applicable regulations. Field personnel should review and understand all applicable federal, state, and local regulations regarding IDW. Regulations may prohibit disposal of certain IDW on-site.

Prior to commencing sampling of remediation, the Field Team Leader will select an area, preferably secure, for IDW storage in consultation with the MEC Response and Removal Task Manager.

Any container used for IDW will be U.S Department of Transportation (DOT) approved. Drums will not be stacked on top of each other and will be stored in rows not larger than two drums wide, with labels facing outward for identification. Decontamination fluids and other low-volume fluids may be temporarily stored and transported in 5-gallon buckets with lids.

Different residual materials (e.g., soil and water) will not be drummed together, but will be placed in separate drums. Field screening will be used to drum materials with similar levels of contamination together, if possible.

2. EQUIPMENT

- Wrangler type boxes
- DOT-approved drums or other containers
- Funnels
- 5-gallon buckets
- Photoionization detector (PID) or other appropriate instrumentation
- Labeling material

3. RELATED PROCEDURES

- SOP Decontamination
- SOP Soil Sampling
- SOP Field Sample Numbering
- SOP Sample Chain-of-Custody
- SOP Sample Packing and shipping

4. IDW MANAGEMENT

All soil cuttings IDW must be placed in drums or other appropriate containers. As existing site information has shown the groundwater to be non-hazardous, the purge water from monitoring wells will be discharged into the ground next to the well to allow infiltration. As necessary, IDW-filled drums will be transported to the secure staging area at the site in accordance with applicable DOT and U.S. Environmental Protection Agency (EPA) regulations.

The IDW-filled drums must be sampled to determine whether they contain materials classified as Resource Conservation and Recovery Act (RCRA) hazardous wastes. IDW-filled drums containing RCRA hazardous wastes must be shipped off-site within 90 days.

The EPA Guide to Management of Investigation-Derived Wastes (January 1992) will be used to assist in management of IDW where necessary.

4.1 SOIL

Soil cuttings and excess samples must be drummed. They will be placed in DOT-approved drums and will be sealed and labeled in accordance with labeling practice.

4.2 LIQUIDS

Residual liquid such as water from well sampling and development will be poured on the ground next to the well. Decontamination water must be containerized. It will be placed in a temporary holding tank or DOT-approved drums or containers as appropriate. Drums will be sealed and labeled in accordance with labeling procedures. Decontamination solvents and test kit solvents will be segregated from aqueous material and allowed to evaporate as much as possible before

being containerized in solvent-specified drums. Liquids drums will contain removable bungs. Funnels will be used to prevent spillage when adding liquids to the drums.

4.3 PERSONAL PROTECTIVE EQUIPMENT (PPE) AND OTHER DISPOSABLES

Project-specific provisions should be made prior to disposal of IDW. Do not assume bagged waste can be disposed of in any dumpster. All non-contaminated disposable wastes such as bags, washed gloves, and material scrap, will be kept separate from other wastes. This material will be bagged or otherwise contained and disposed of in the Field Office dumpster or other appropriate and approved location.

Contaminated disposable wastes may include disposable PPE and contaminated equipment. This material will be placed in wrangler-type boxes unless field screening results of soil and/or waste residuals indicate non-elevated results.

5. DISPOSAL OPTIONS

Wastes that have been drummed based on field criteria may be sampled for laboratory analysis to determine the appropriate type of disposal facility. The number of samples collected will depend on the homogeneity of the drummed material, the nature of the source areas, and the requirements of the disposal facility.

IDW characterized or listed as hazardous waste will be managed and disposed of in a manner consistent with local and state guidance, and federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and/or RCRA or Toxic Substances Control Act (TSCA) guidelines.

IDW determined to be non-hazardous waste will be managed and disposed of in accordance with state and/or local guidelines.

5.1 LABELING

Pending a determination of whether the IDW is hazardous or non-hazardous, containers will be labeled on the side using a weather-resistant paint pen. The following information will be included:

- Investigation Derived Waste (IDW)
- Sampling location identification.
- Sampling area designation.
- Point of contact with phone number.
- Type of material.
  - OB—Overburden soil and cuttings.
  - SD—Sediment.
  - GW—Groundwater from wells.
  - DW—Decontamination water.
  - DS—Disposables.
  - SV—Decontamination solvents.
- Water content.
  - SAT—Saturated.
  - UNSAT—Unsaturated.
- For drums containing liquids, indicate the approximate fill line on the outside of the drum. Do not fill more than two-thirds full with liquids.
- Range of field screening results and instrument type.
- Date the drum was filled and sealed.

Only IDW pending analysis may be labeled. Any wastes known to be RCRA or TSCA wastes based on knowledge of the waste material must be managed as RCRA or TSCA at the point of generation. Upon receipt of analytical results for those IDW containers, the respective containers must immediately be managed appropriately.

6. REFERENCES

EPA (U.S. Environmental Protection Agency). 1992. Guide to Management of Investigation-Derived Wastes. January 1992.

APPENDIX H
CONTRACTOR PERSONNEL QUALIFICATIONS CERTIFICATION LETTER

Certifications of UXO Techs will be maintained on site in the field office

Former Camp Bonneville Site Personnel

Certifications are kept on file on site and available for inspection at any time.

George Overby	Project Manager
Tony Clark	MEC Task Manager
Bruce Moe	SUXOS
Michael Everman	UXOSO
Randy Schneider	UXOQCS
Drew Caldwell	UXO TECH 3
Pete Grubb	UXO TECH 3
Rex Andreasen	UXO TECH 2 ½
Glenn Haupt	UXO TECH 2 ½
Nicholas Clark	UXO TECH 2
Ian Wiekamp	UXO TECH 2
Greg Cook	UXO TECH 2
Butch Mendez	UXO TECH 2
James Koch[3]	UXO TECH 2
Karl Christiansen	UXO TECH 2
Wes Bain	UXO TECH 2
Kristen Mendez	UXO TECH 2
Kacy Cameron	UXO TECH 2
Jennifer Chester	UXO TECH 1
Reida Johnson	UXO TECH 1
Tiffany Dana	UXO TECH 1
Cecilia Flores	UXO TECH 1

APPENDIX I
EXPLOSIVES SAFETY SUBMISSION (CD only)

DEPARTMENT OF THE ARMY
US ARMY DEFENSE AMMUNITION CENTER
1 C TREE ROAD
MCALESTER OK 74501-9053

REPLY TO
ATTENTION OF

JMAC-ESM 9 July 2012

MEMORANDUM FOR Department of Defense Explosives Safety Board (DDESB-PE/Ms. Bigej), 2461 Eisenhower Avenue, Alexandria, VA 22331-0600

SUBJECT: Request DDESB Approval, Explosives Safety Submission, Munitions and Explosives of Concern Non-Time Critical Removal, Munitions Response Site CVF&AW and MRS WSA, Camp Bonneville, WA

1. References:

a. Memorandum, Weston Solutions, dated 24 May 2012, subject: Explosives Safety Submission, Munitions and Explosives of Concern Non-Time Critical Removal Central Valley Floor and Associated Wetlands (CVF&AW), Camp Bonneville, Vancouver, Washington (encl).

b. DoDM 6055.09, Ammunition and Explosives Safety Standards, 29 February 2008, Administratively Reissued 4 August 2010.

2. Reference 1.a, with the enclosed Explosives Safety Submission (ESS), is provided for your approval IAW with paragraph V7.E4.5.1.1 of reference 1.b. We have reviewed the subject ESS and recommend approval.

3. This ESS addresses the munitions and explosives of concern response removal actions at the Munitions Response Site Central Valley Floor and Associated Wetlands (CVF&AW) and selected areas of the regional Park Western Slopes Area (MRS WSA).

4. The POC is Ms. Charlotte Curtis, JMAC-ESM, DSN 956-8742, commercial (918) 420-8742, email charlotte.g.curtis.civ@mail.mil.

CHARLOTTE G. CURTIS
MEC Team Action Officer
Explosives Safety Knowledge, MEC
and Chemical Division
US Army Technical Center for
Explosives Safety

JMAC-ESM
SUBJECT: Request DDESB Approval, Explosives Safety Submission, Munitions and Explosives of Concern Non-Time Critical Removal, Munitions Response Site CVF&AW and MRS WSA, Camp Bonneville, WA

CF: (w/encl)
Office of the Director of Army Safety (DACS-SF/Mr. Patton and Mr. Walker), 223 23rd Street, Crystal Plaza 5, Suite 980, Arlington, VA 22202
Office of the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health, Special Assistant for Munitions, (DASA-DESOH/Mr. King), 110 Army Pentagon, Washington, DC 20310-0110
Weston Solutions, Inc., 1340 Treat Boulevard, Suite 210, Walnut Creek, CA 94597

Weston Solutions, Inc.
1340 Treat Boulevard
Suite 210
Walnut Creek, California 94597
www.westonsolutions.com

Ser 001/GO
May 24, 2012

Ms. Charlotte G. Curtis
Safety Manager, USATCES
Building 35, IC Tree Road
McAlester, OK 74501-9053

SUBJECT: Explosives Safety Submission, Munitions and Explosives of Concern Non-Time Critical Removal Central Valley Floor and Associated Wetlands (CVF&AW), Camp Bonneville, Vancouver, Washington

Dear Ms. Curtis:

Weston Solutions, Inc. is pleased to submit for USATCES review the Explosives Safety Submission, Munitions and Explosives of Concern Non-Time Critical Removal Central Valley Floor and Associated Wetlands (CVF&AW), Camp Bonneville, Vancouver, Washington.

If you have any questions regarding this report, please do not hesitate to contact me directly at (864) 399-9902.

Sincerely,
WESTON SOLUTIONS, INC.

George R. Overby, CHMM
Senior Service Line Leader – Munitions Response Program

Enclosure (1) *Explosives Safety Submission, Munitions and Explosives of Concern, Non-Time Critical, Central Valley Floor and Associated Wetlands (CVF&AW), Camp Bonneville, Vancouver, Washington*

Final

Explosives Safety Submission

MUNITIONS AND EXPLOSIVES OF CONCERN NON-TIME CRITICAL REMOVAL

Central Valley Floor and
Associated
Wetlands (CVFAW)

Camp Bonneville, Vancouver,
Washington

May

2012

Prepared by Weston Solutions, Inc.
for
Clark County Department of Public Works
Vancouver, Washington

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Appendix B: Calculation Sheets and Documentation of Minimum Separation Distances

1.0 BACKGROUND

This Explosives Safety Submission (ESS) is prepared in support of munitions and explosives of concern (MEC) response removal action on Munitions Response Site (MRS) Central Valley Floor and Associated Wetlands (CVFAW) and selected areas of the regional Park Western Slopes Area WSA MRS (< 25% slope) at the former Camp Bonneville Military Reservation (CBMR) in Vancouver, Washington. Table 1-1 summarizes the total acreage, munitions response action, and institutional controls to be used during the response action for each MRS.

Table 1-1: Summary of MRSs

Area	Total Acreage	Munitions Response Action	Institutional Controls (IC)
CVFAW	432	MEC Surface and Subsurface Clearance to Depth of 14 inches.	No area-specific IC required
WSA	425	MEC Surface Clearance on less than 25% slope	Area-specific IC required, signage to remain on roads and trails

Between 1909 and 1995, live and practice munitions including artillery and mortar rounds, shoulder-fired rockets, land mines (practice only), grenades, and small-arms ammunitions were stored and used on the CBMR. CBMR was selected in 1995 as a Department of Defense Base Realignment and Closure (BRAC) property. Clark County Government was selected as the Local Redevelopment Authority (LRA) for the property. CBMR was transferred to Clark County in August 2006.

1.1 SITE LOCATION

The 3,840-acre CBMR site is located northeast of Vancouver, Washington, in the southeastern region of Clark County (Appendix A, Figure 1). The property is approximately five miles northeast of the corporate limits of the City of Vancouver, Washington and approximately seven miles north of the Columbia River.

1.2 SITE DESCRIPTION

The terrain within the CVFAW is generally flat with only slight upward inclines along the southern border. The Central Valley Floor (CVF) consists of 322 acres and the associated wetlands (AW) consists of approximately 120 acres. Vegetation ranges from native grasses to old growth trees and forest undergrowth. Removal of vegetation will be necessary for detection and removal operations. Terrain and vegetation will not hinder detection and removal operations.

The terrain within the WSA is gently rolling to very steep terrain. The WSA consists of

609 acres which only 425 acres are considered accessible due to steep terrain. This ESS covers all acreage within select areas of WSA (< 25% slope) approximately 425acres. Vegetation ranges from native grasses to old growth trees and forest undergrowth. Removal of vegetation will be necessary for MEC surface clearance operations. Terrain and vegetation will not hinder MEC surface clearance operations.

1.3 SOIL CONDITION

There is a potential for encountering volcanic rock such as basalt in both MRSs; however, no significant impacts to geophysical or MEC clearance operations are anticipated.

1.4 SITE HISTORY

The CVFAW was an extensively-used target and training area as identified in historical operations reports and confirmed through the number of surface munitions and explosives of concern (MEC) and munitions debris (MD) items found and subsurface anomalies detected during previous Interim Actions. Over 750 MEC and MD items were encountered during surface removal operations in the CVFAW. Additionally over 38,000 subsurface anomalies were detected during the surface clearance of the CVF. A number of new target areas and/or waste disposal areas in the CVF were identified, including the following:

- Stokes Mortar Target Area.
- MEC Disposal Area (Burial Pit).
- Open Burn/Open Demolition (OB/OD) Area.
- 37-millimeter (mm) Artillery/Stokes Mortar Target Area.
- Rifle Grenade Target Area.
- 2.36-inch Rocket Target Area near the Former Sewage Lagoons.

The WSA use was limited to non-live fire exercises where pyrotechnics and blank ammunition were typically used to train troops and convoys in tactics. However, during transect investigations in the WSA two Stokes mortars (fired, unfuzed) were recovered.

1.5 CURRENT AND FUTURE LAND USE

1.5.1 Current Land Use

Since 1995, the CBMR has been maintained in caretaker status. Law enforcement agencies use CBMR small arms ranges.

1.5.2 Future Land Use

The CBMR will be used as a Clark County regional park. Uses will include camping and hiking. The CFVAW comprise the major portion of the proposed regional park. The CVF includes both future High Intensity Reuse Areas (e.g., tent camping areas/construction) as well as Accessible Medium Intensity Reuse Areas (non-intrusive

activities). The WSA is classified as Limited Access Medium Intensity Reuse areas in the future Regional Park and have limited future reuse intensity due to terrain, vegetation and location outside the Central Valley in the Regional Park.

The Accessible Medium Intensity Reuse Areas differ from the High Intensity Reuse Areas only in the number of people and type of activities likely to occur in these areas.

1.6 PROJECT AREA

This ESS applies to MRS CVFAW (Appendix A, Figure 2) and MRS WSA (Appendix A, Figure 3).

1.6.1 General

A description of the MRSs covered by this ESS is given in Section 1 and shown in Table 1.1. This ESS covers the munitions response actions: removal to 14 inches bgs for MRS CFVAW and surface removal for MRS WSA. The munitions response actions remaining at CBMR include the below MRSs and will be addressed in future ESSs as funding becomes available:

- Central Impact Target Area (CITA) Clearance and Expansion
- Demolition Area 1/Landfill 4
- Demolition Areas 2-3
- Western Slopes Area Surface Clearance (remainder area)
- Firing Points and Target Areas
- Remaining stepouts from previous clearance

1.6.2 Historical and Characterization Data Analysis

MEC and MD surface findings to date in the CVFAW include the following: 3.5-inch and 2.36-inch training rockets, 75millimeter (mm) and 37mm high explosive (HE) projectiles, HE, chlorobenzylidene malonitrile (CS), and smoke grenades, rifle grenades, training anti personnel and anti tank land mines and various sub caliber rounds. In addition to this, several previously uninvestigated MEC and MD burial pits and a disposal area were identified. Historically, the 75mm HE projectile has been the round with the greatest fragment distance found in the CVFAW. A 105mm HE projectile was also encountered next to the old magazines, however, it was unfuzed, in a storage configuration, and determined to be an isolated military munition.

A summary of CVFAW munitions response and related activities conducted from 1997 to 2009 are presented below.

- Archives Search Report (ASR) 1997 – The ASR outlined the nature and degree to which MEC may potentially be present contamination at CBMR.
- MEC Site Characterization 1998 – The purpose of this action was to determine the presence and density of MEC at CBMR.
- Time-critical Removal Action (TCRA) 1999, 2000 – The purpose of this action was

to remove all live and inert MEC and any MD in the two former M203 rifle grenade ranges TA 8 and TA 9. These ranges totaled approximately 12 acres combined. Both of these ranges are within the CVF. This action was expanded to 19 acres that included a buffer zone around the two former ranges. Geophysical surveys and munitions response removal actions were conducted at TA 8 and TA 9 to a depth of two feet.

- Instrument-aided Field Reconnaissance 2001/2002 – The action was to confirm the location and characterize any MEC-related characteristics of Areas of Concern (AOCs) and Areas of Potential Concern (AOPCs) within the CVF.
- Bonneville Conservation Restoration and Renewal Team, LLC (BCRRT) Remedial Action Unit (RAU) 3 site-wide munitions cleanup-2006/2009 – During the course of this cleanup, numerous MEC and MD items were found in areas of the CVFAW where they were not anticipated. Washington Department of Ecology (WDOE) required the BCRRT to conduct a supplemental Remedial Investigation / Feasibility Study (RI/FS). The results of the report determined that a much more thorough cleanup action was needed for the future land use of the CVFAW.

The results of the actions listed above have been used by the US Army, regulatory agencies and other stakeholders to select and design the munitions response activities associated with this ESS within both MRSs.

1.6.3 Selected Munitions Response Actions

Table 1-1 summarizes the munitions response actions for MRS CVFAW and WSA.

1.6.3.1 Land Use Controls

For each MRS, those Land Use Controls selected as likely to be effective and feasible are described in Section 10.1 of this ESS.

1.7 REASON FOR MUNITIONS AND EXPLOSIVES OF CONCERN

The site history in Section 1.4 provides the reason for MEC on the property.

1.8 TYPE OF MEC

The results are detailed in Section 1.6.2 above and Table 1-2.

Table 1-2: Type and Depth of MEC Recovered

MRS	MEC Recovered	Maximum Depth of MEC Recovered during Site Investigation (below ground surface [bgs])	Maximum Geophysical Detection Depth (below ground surface [bgs])
CVFAW	3 inch Stokes	6 inches	33 inches
WSA	75 mm HE Mk I	10 inches	33 inches

2.0 FIGURES

Figures are presented in Appendix A. Figure 1 shows a map of the site in relation to the surrounding area. Figures 2 and 3 are maps showing each MRS with the Quantity Distance (Q-D) arcs that will be used during the MEC removal action in that area. Figure 4 shows the established demolition area with its Q-D arcs. Figure 5 shows the explosives storage magazine Q-D arcs and the location of the magazine within the CBMR.

3.0 EXPLOSIVES SAFETY QUANTITY-DISTANCE

3.1 MUNITION WITH GREATEST FRAGMENTATION DISTANCE

The munition with the greatest fragmentation distance (MGFD) at each MRS is identified in Table 3-1. If a MEC with a greater fragmentation distance is encountered, the minimum separation distance (MSD) will be adjusted in accordance with the Department of Defense Explosive Safety Board (DDESB) Technical Paper 16, operations will continue, and an amendment to this ESS will be submitted for approval (a copy of this document will be available on site). Q-D arcs will be adjusted accordingly.

Table 3-1: Minimum Separation Distances

MRS	MEC [2]	MSD (feet) [1]			
		For Unintentional Detonations		For Intentional Detonations	
		Hazard Fragmentation Distance (HFD)	Team Separation Distance (K40)	Without Engineering Controls (Maximum Fragmentation Distance – Horizontal [MFD-H])	Using Sandbag Mitigation
CVFAW	3 inch Stokes	225	52	1379	200
WSA	75 mm HE Mk I	239	47	1873	200

Notes:

1 See Appendix B for calculation sheets and documentation of MSD.

2 MGFD during removal operations.

3.2 MEC AREAS

The MSD restrictions from MEC areas to non-essential personnel will be applied during all surface and subsurface MEC removal and disposal operations.

3.3 DEMOLITION EXPLOSIVES

3.3.1 Explosive Storage Magazines

Donor explosives will be stored in two Bureau of Alcohol, Tobacco, and Firearms (BATF) Type 2 magazines with attached detonator boxes. The magazines will be sited as depicted on Appendix A, Figure 5 as described in Section 7.2. No more than 100 pounds (lbs) net explosive weight (NEW) will be stored in a single magazine. The Inhabited Building Distance (IBD) for this NEW is 658 feet in accordance with the Department of Defense (DoD) 6055.09-M Table V3.E3.T2 and the Public Transportation Route (PTR) distance is 395 ft in accordance with DoD 6055.09-M Table V3.E3.T2. These distances are more safety conservative than those prescribed by the BATF. Magazines will be separated by a minimum of the Intermagazine Distance (IMD) K11 of 51 feet. In accordance with DoD 6055.09-M V3.E3.T8. These commercial explosives will have

assigned DoD hazard division/storage compatibility groups (HD/SCG) and will be stored in accordance with DoD 6055.09-M, DA Pam 385-64 and any local installation regulations.

3.4 PLANNED OR ESTABLISHED DEMOLITION AREAS

The established demolition area has been set inside the CITA on the west side near the western most target area as shown on Appendix A, Figure 4. This location will provide enhanced security for the demolition operations since it is inside the CITA fence and is accessible by only one road. There are no public traffic routes or inhabited buildings within the Q-D arcs. Sandbag mitigation or earth tamp engineering controls will be used at all times during this clearance to reduce the MSD as described in Section 7.3 of this ESS.

3.5 FOOTPRINT AREAS

3.5.1 Blow-in-Place

If MEC items are acceptable to move, they will be relocated to the CITA for later disposal, if an item is unacceptable to move, it will be blown-in-place using engineering controls. An MSD will be established in accordance with Table 3-1 and procedures outlined in Section 7 of this ESS will be followed.

3.5.2 Collection Points

Collection points are those areas used to temporarily accumulate MEC pending destruction at the end of the day or end of the week using consolidated shots. The NEW at a collection point will be limited such that the K40 overpressure distance for the total NEW does not exceed the HFD for the area. MEC will not be left unattended at any location in the CVFAW or the WSA during any phase of the MEC removal action.

3.5.3 In-Grid Consolidated Shots

No in-grid consolidated shots will be conducted.

3.6 MAXIMUM CREDIBLE EVENT (MCE)

It is not anticipated that any explosive soil as defined in DoD 6055.9-M, V7 E4.4 will be encountered. Any suspected explosive contaminated soil will be sampled. If explosive soil is confirmed it will be isolated in a manner protective of the environment and a remediation plan will be designed by WESTON and Clark County. The MSD will be calculated in accordance with DoD 6055.09-M V7.E4.5.8.3.7.4.2.

4.0 START DATE

The projected start date for this project is 04 June 2012.

5.0 MEC MIGRATION

With the exception of frost heave and surface water erosion, there does not appear to be any other naturally occurring phenomenon that could significantly impact MEC migration. According to Unified Facilities Criteria 3-310-01 (DoD 2005), the average depth of the frost for CBMR is 14 inches.

6.0 DETECTION EQUIPMENT AND RESPONSE TECHNIQUES

6.1 REMOVAL DEPTH

The removal depth for each munitions response area is listed in Table 1-1.

6.2 DETECTION EQUIPMENT

A combination of one or more of the following detection technologies will be used at this site.

6.2.1 Analog Clearance using Flux-Gate Magnetic Gradiometers that may be used

- Subsurface Instruments ML -3
- Magna-Trak 200® Series
- GA-52 Schonstedt

6.2.2 Analog Clearance using Electromagnetic Induction that may be used

- Minelabs F3 UXO
- Whites Spectrum XLT

6.2.3 Digital Geophysical Mapping Using Time-Domain Electromagnetic Induction that may be used

- Geonics EM-61 MK2 time-domain electromagnetic induction instrument
- Geonics EM-61 MK2 Handheld instrument

6.3 SWEEP PROCEDURES

The visual survey portions of the MRS will be divided into search lanes that are suitable for the equipment and terrain. The search lanes will be optimized based on site conditions and lanes will be delineated with line, flags, marking paint and/or marking tape.

6.4 EXCLUSION ZONE CONTROL

Prior to initiation of on-site MEC operations, all nonessential personnel and inhabited buildings will be evacuated and personnel removed to outside the HFD-H, exclusion zone (EZ). Once

MEC operations commence, positive control of the EZ will be maintained, only essential personnel will be allowed inside the EZ and non-essential personnel will be prevented from entering the EZ by a combination of road closures, signage and security guards.

6.5 INTRUSIVE INVESTIGATION

Only unexploded ordnance (UXO)-qualified personnel and UXO Tech Is under supervision of UXO-qualified personnel will perform excavation and investigation of anomalies. Earth moving machinery such as a backhoe may be used to assist in removing the overburden within 12 inches to the side or top of the anomaly hand tools will be used to remove the remaining overburden.

Soil excavation, stockpiling and sifting may be employed to remove MEC, MD and other masking debris from areas with conditions that preclude DGM and analog surveys. The actual area(s) containing significant amounts of potential subsurface MEC, MD and other masking debris requiring the use of this removal process will be confirmed during remediation. The non-MEC items will be transported to an approved off-site facility. The final sifted material will be returned to the original excavation.

6.6 QUALITY CONTROL AND QUALITY ASSURANCE

A quality program provides procedures for controlling and measuring the quality of all work performed during all site activities. All quality control (QC) and quality assurance (QA) activities will be performed and documented in accordance with all applicable technical/professional standards and the approved Work Plan and Quality Assurance Site Plan (QASP).

6.6.1 QUALITY CONTROL

QC is an ongoing process that will include process observation and testing. The QC program will be managed by the project UXO Quality Control Specialist (UXOQCS). Upon completion of clearance activities in each grid, the team leader will inform the Senior UXO Supervisor (SUXOS) that the grid is ready for inspection. The SUXOS will turn the completed grid over to the UXOQCS for inspection and verification. Testing techniques include the following:

- Verification of clearance of at least 20% of completed Digital Geophysical Mapping (DGM) selected target investigations, randomly selected at the start of the project. This may be lowered to 10% if the QC/QA objectives are being met or exceeded;
- Verification of reported no finds of DGM anomalies using the type detection instrument used in initial detection;
- A sweep of at least 20% of real time survey areas using handheld detectors with similar capabilities of those used to clear the area at the start of the project. This may be lowered to 10% if the QC/QA objectives are being met or exceeded;
- Review of daily DGM QC data including coverage maps. This QC audit may be performed by an independent geophysicist contracted by Clark County;
- Ground truth of DGM data. This may include electronic sweeps of randomly selected DGM completed areas;
- Random inspection of detection instruments;
- Random inspection of MEC/MD inspection process; and
- Blind seeding of the MRS.

6.6.2 QUALITY ASSURANCE

Completed work that has passed UXOQCS inspection will be submitted to Clark County for QA inspection, as applicable.

7.0 DISPOSITION TECHNIQUES

7.1 DEMOLITION OPERATIONS

All explosive operations will follow the procedures outlined in Technical Manual (TM) 60A-1-1-31. Demolition operations will be performed daily or properly secured until operations can be conducted.

7.2 EXPLOSIVE STORAGE, ACCOUNTABILITY, AND TRANSPORTATION

Explosives will be stored in BATF Type 2 explosives magazines at the location shown on Appendix A, Figure 5. Total control of explosives will be maintained while the explosives are on site. All vehicles transporting explosives will be properly inspected and equipped.

7.3 ENGINEERING CONTROLS

Sandbag mitigation or earth tamp engineering controls will be used at all times during this clearance to reduce the intentional detonation MSD. These controls will be used in accordance with HNC-ED-CS-98-7, HNC-ED-CS-S-00-3, HNC safety advisory dated 7 November 2011, and DDESB memo dated 29 November 2010 (Clarification regarding use of sandbags for mitigation of fragmentation and blast effects due to intentional detonation of munitions).

7.4 SCRAP PROCEDURES

7.4.1 Inspection and Certification

Munitions potentially presenting an explosive hazard (MPPEH) procedures will be in accordance with DoD instruction (DoDI) 4140.62 and EM1110-1-4009. All MPPEH will be assessed and its explosives safety status determined and documented prior to transfer within the DoD or release from DoD control. Prior to release to the public, MPPEH will be documented by authorized and technically qualified personnel as Material Documented as Safe (MDAS) after a 100% inspection by two (2) Qualified UXO Technicians to determine that it is safe from an explosives safety perspective.

7.4.2 DD Form 1348-1A

Upon completion of all removal activities, WESTON Solutions will complete a DD Form 1348-1A in accordance with EM 1110-1-4009 Chapter 14 to include the following statement.

"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 material."

7.4.3 Alternative Disposal Techniques

Small arms ammunition may be shipped to a specialized processor for disposal. The processor will be qualified to receive, manage, and process MPPEH in accordance with DoDI 4140.62. Packaging and transportation will comply with current Code of Federal Regulations (CFR).

8.0 ENVIRONMENTAL, ECOLOGICAL OR CULTURAL CONSIDERATIONS

No environmental or ecological (e.g., endangered species) impacts are expected during the munitions response actions identified in this ESS. However, while cultural considerations have not impacted or limited the munitions response actions selected for the CBMR, there is a potential for impact if cultural resources are located during the MEC removal actions. If cultural resources are identified, Clark County will be consulted to develop mitigation strategies to protect and or limit damage to the cultural resource.

9.0 TECHNICAL SUPPORT

9.1 MILITARY SUPPORT

In the event that a MEC item is encountered that cannot be positively identified, or a chemical filled munitions is suspected, the SUXOS will contact the Clark County Munitions Safety Advisor, who will be responsible for contacting the United States Army to obtain military Explosive Ordnance Disposal (EOD) assistance. WESTON shall maintain security at the site until military EOD support arrives, and will assist the military EOD as requested.

9.2 CONTRACTOR

All contractor UXO personnel will meet the training and minimum experience required by DDESB TP-18.

10.0 RESIDUAL RISK MANAGEMENT

10.1 LAND USE CONTROLS

Land use controls will be required to ensure protection of human health and the environment. Clark County has since recorded the Restrictive Covenants with the office of the Clark County Auditor. The land use controls that have been filed include:

- Residential Use Restriction;
- No Dig/Land Disturbance Restriction;
- No Public Access allowed during the Cleanup Period; and
- UXO construction support.

10.2 LONG-TERM MANAGEMENT

Clark County will be responsible for long-term maintenance (LTM). The LTM to be conducted will include but not limited to the maintenance of the fence and signs, and review and maintenance of institutional controls.

11.0 UXO SAFETY EDUCATION PROGRAM

Clark County will establish a limited MEC Awareness Safety Notification to inform the public of the dangers presented by unexploded ordnance, during cleanup, and a post remediation. MEC Awareness Safety Notification shall be implemented as an institutional control consistent with the planned reuse activities.

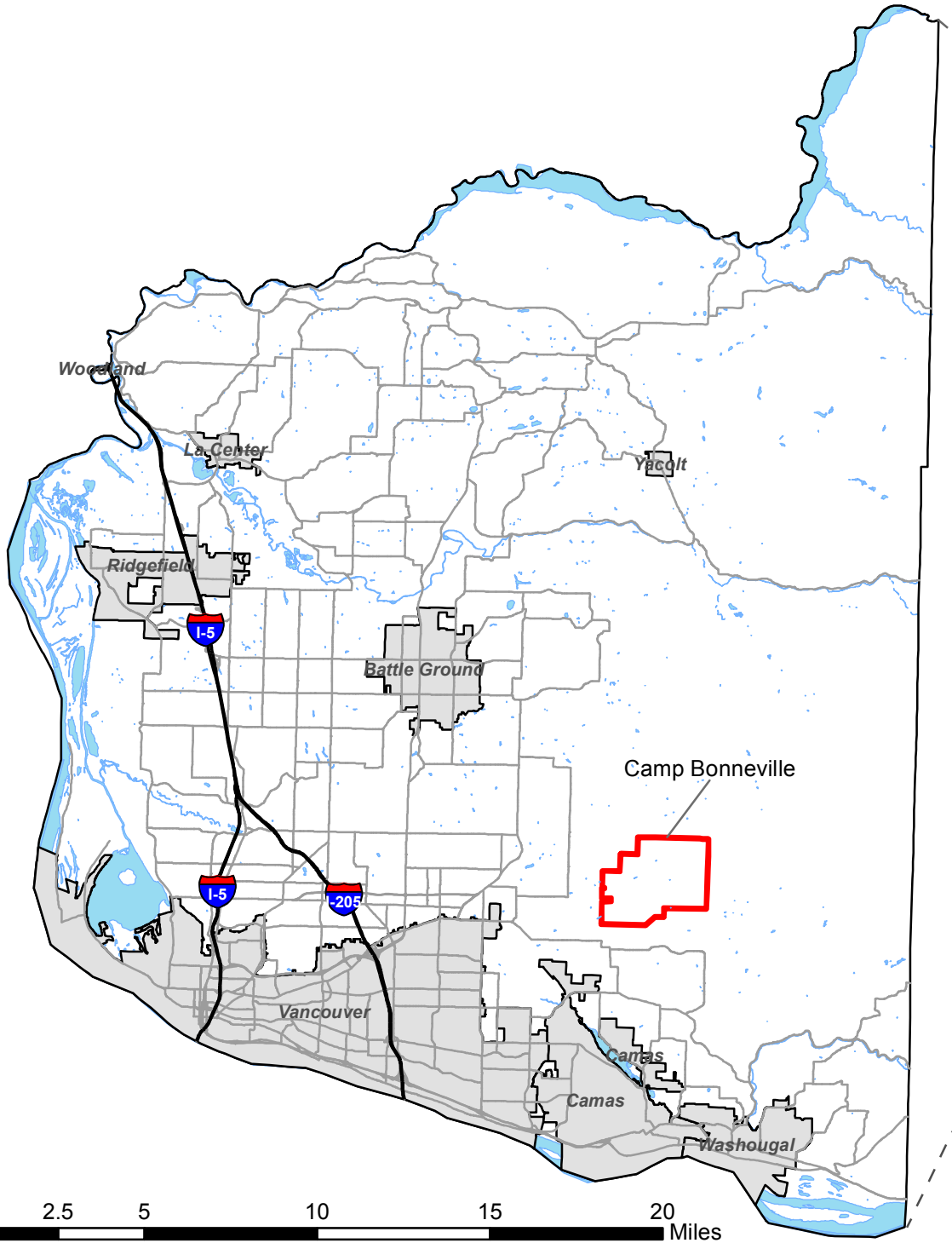
12.0 STAKEHOLDER INVOLVEMENT

In accordance with the Prospective Purchaser Consent Decree (PPCD), a public participation plan has been approved for the stakeholders of CBMR. The stakeholders are the Army BRAC office, Clark County, WDOE, and the community advisory board. Clark County shall update this Public Participation Plan for the Property periodically and submit it to WDOE for review and approval. WDOE shall maintain the overall responsibility for public participation at the CBMR; however, Clark County shall administer and facilitate the community advisory board meetings.

13.0 CONTINGENCIES

None have been identified at this time.

APPENDIX A MAPS



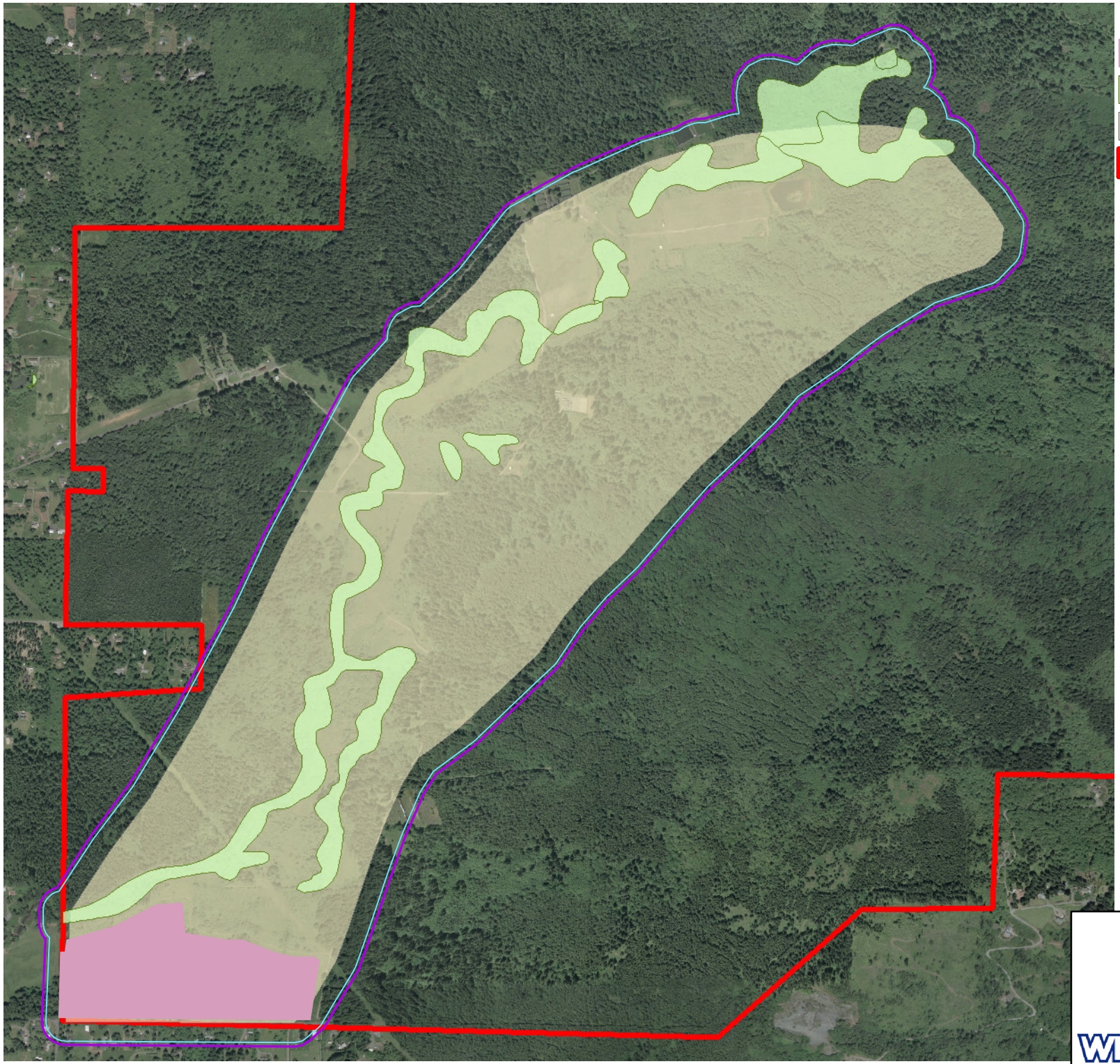
N

Clark County Public Works
Camp Bonneville Military Reservation
23201 NE Pluss Road
Vancouver, WA 98682

WESTON SOLUTIONS

Figure 1
Project Location

Drawn On: 03/03/11 Drawn By: JFB

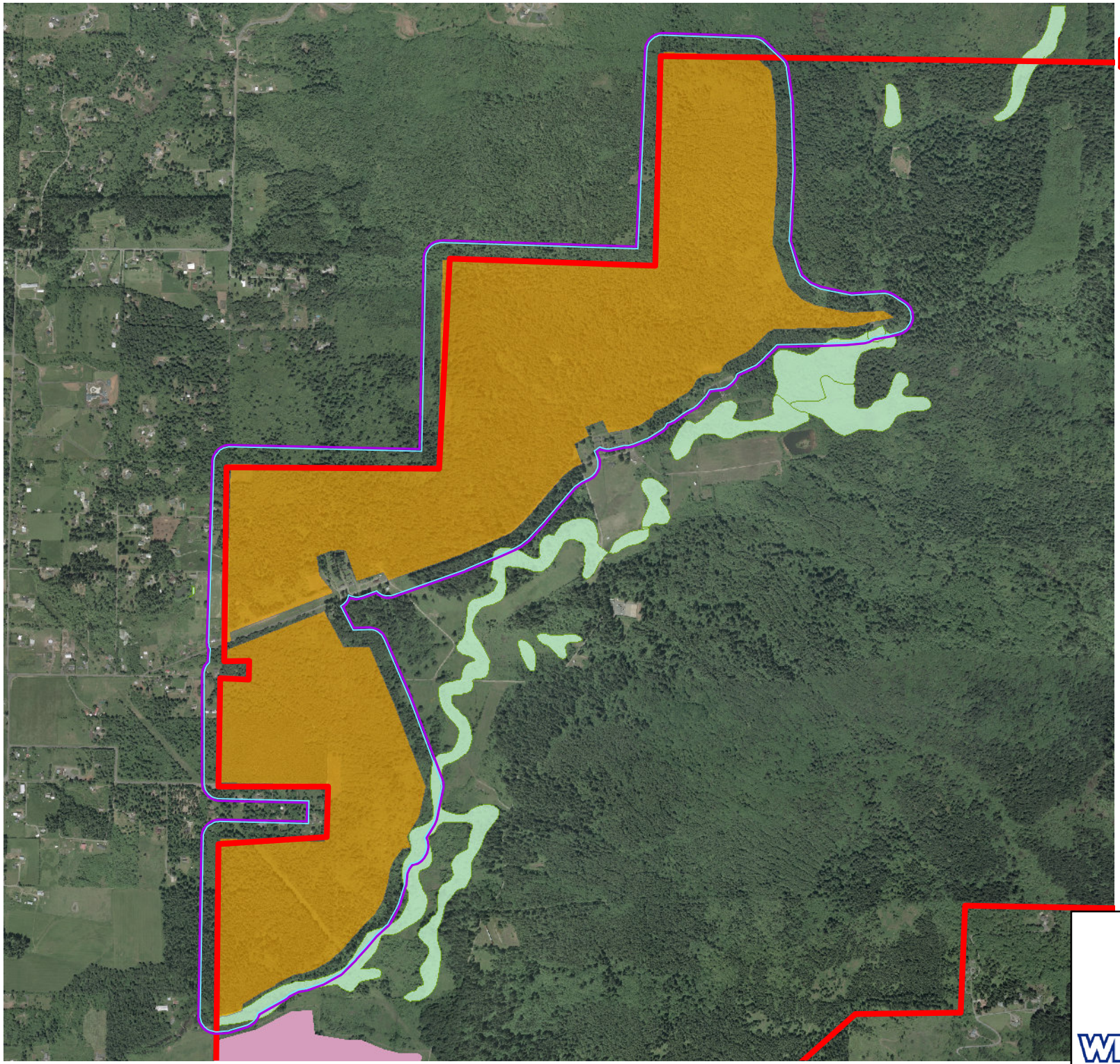


Clark County Public Works
Camp Bonneville Military Reservation
23201 NE Pluss Road
Vancouver, WA 98682

WESTON SOLUTIONS

Figure 2
Valley Floor HFD

Drawn On: 04/18/11 Drawn By: JFB

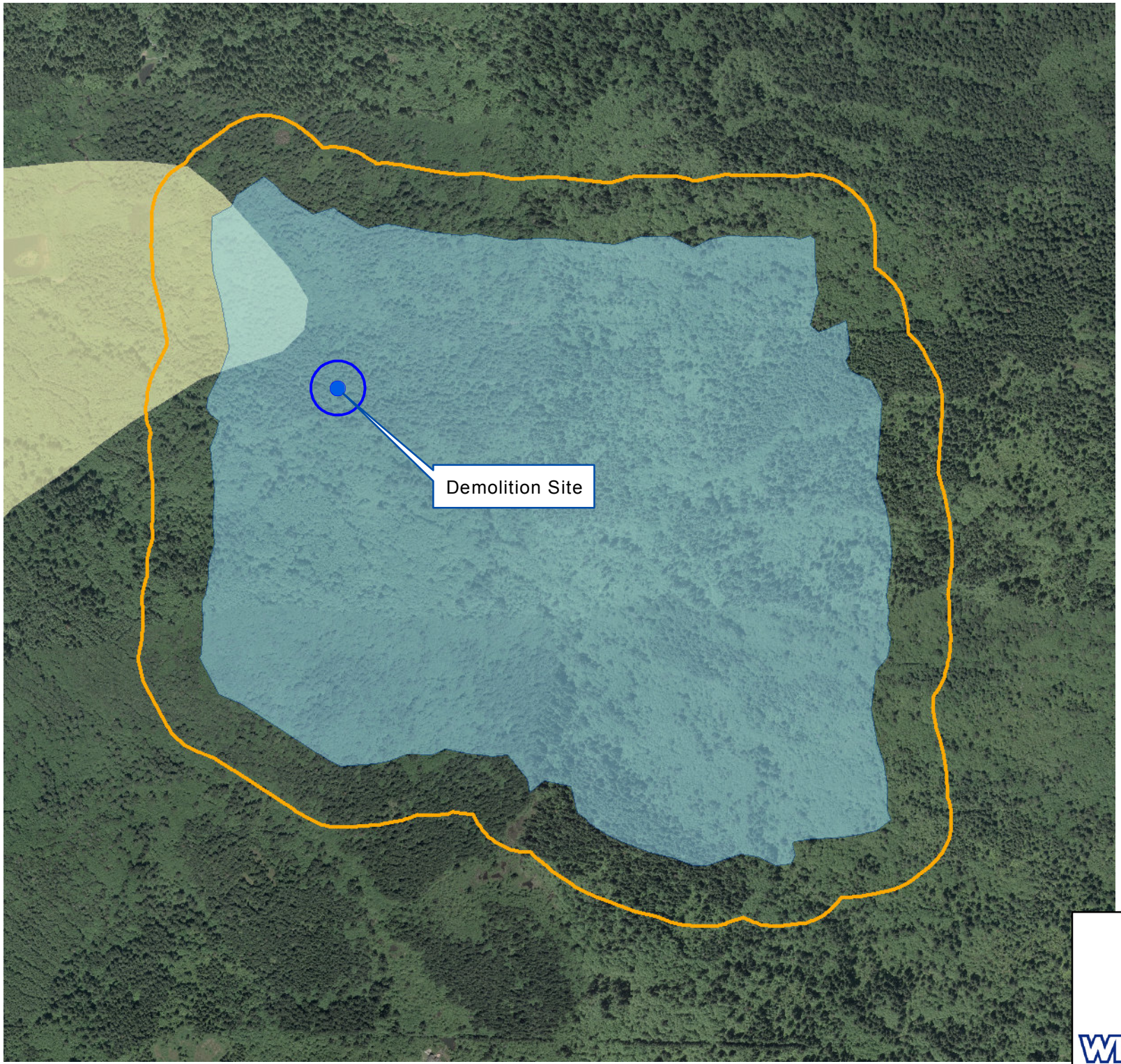


Clark County Public Works
Camp Bonneville Military Reservation
23201 NE Pluss Road
Vancouver, WA 98682

Figure 3
Western Facing Slopes

WESTON SOLUTIONS

Drawn On: 04/18/11 Drawn By: JFB



Legend

- Central Impact Target Area
- CITA Fence Buffer (447 ft)
- Wetland Area
- Central Valley Floor
- Demolition Area Maximum Fragmentation Distance with Engineering Controls (200 ft)

N

0 375 750 1,500 Feet

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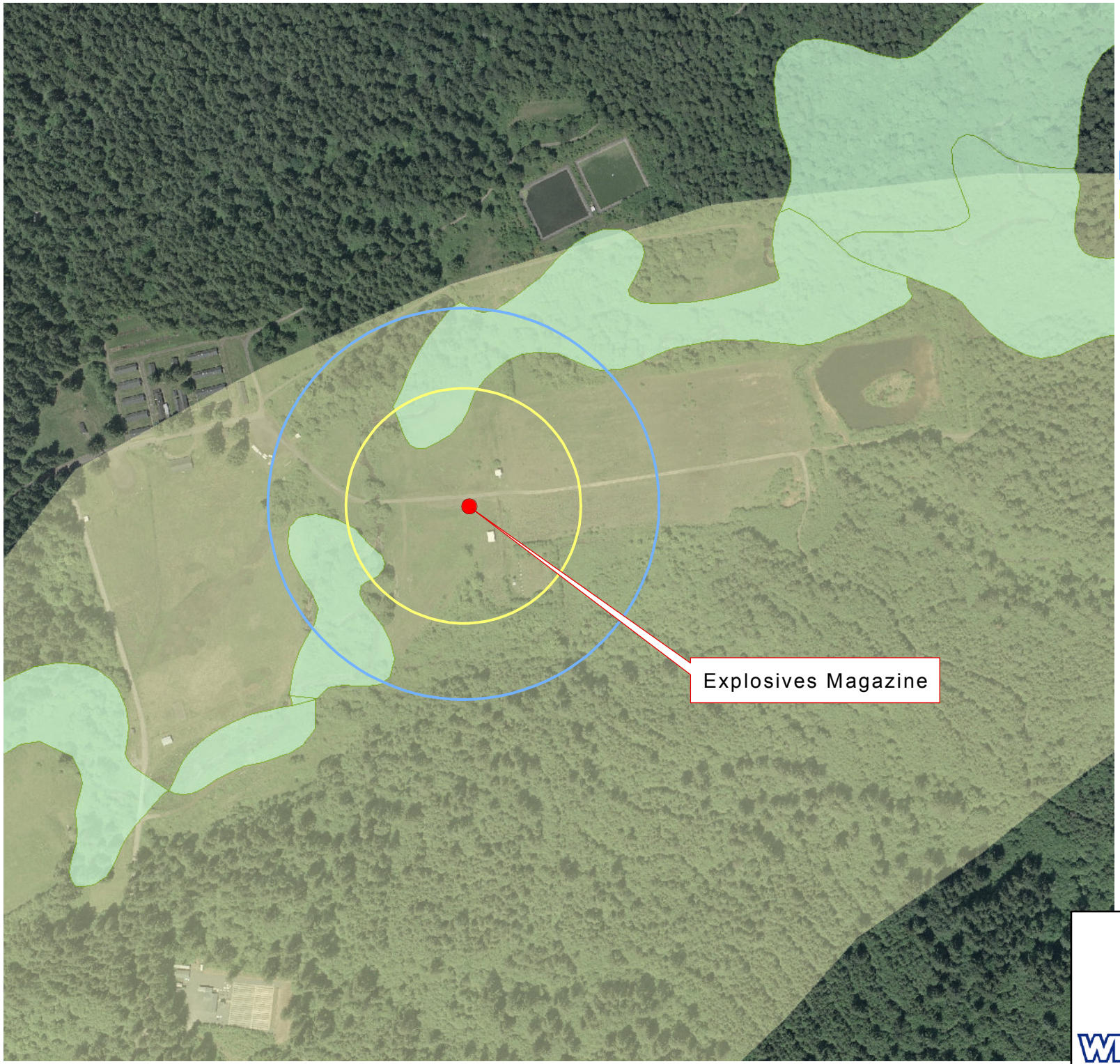
Figure 4
CITA Buffer and Demolition Area

WESTON SOLUTIONS

Drawn On: 04/18/11 Drawn By: JFB



Legend

- Central Valley Floor
- Wetland Area

Explosives Magazine

- IBD (658 ft) Inhabited Building Distance
- PTRD (395 ft) Public Transportation Route Distance

N

0 125 250 500 750 Feet

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Camp Bonneville Military Reservation
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WESTON SOLUTIONS

Figure 5
Explosives Magazine

Drawn On: 04/18/11 Drawn By: JFB

APPENDIX B CALCULATION SHEETS AND DOCUMENTATION OF MINIMUM SEPARATION DISTANCES

Fragmentation Data Review Form

Database Revision Date 10/18/2011

Category:	Surface-Launched HE Rounds
Munition:	3 in Stokes
Case Material:	Steel, Mild
Fragmentation Method:	Naturally Fragmenting
Secondary Database Category:	Mortar
Munition Case Classification:	Robust

DODIC:	
Date Record Created:	9/21/2004
Record Created By:	MC
Last Date Record Updated:	9/14/2011
Individual Last Updated Record:	SDH
Date Record Retired:	

Munition Information and Fragmentation Characteristics

Explosive Type:	TNT
Explosive Weight (lb):	2.15
Diameter (in):	3.0000
Cylindrical Case Weight (lb):	3.29900
Maximum Fragment Weight (Intentional) (lb):	0.0479
Design Fragment Weight (95%) (Unintentional) (lb):	0.0074
Critical Fragment Velocity (fps):	6017

Required Sandbag Thickness

TNT Equivalent (Impulse):	1
TNT Equivalent Weight - Impulse (lbs):	2.150
Kinetic Energy 10^6 (lb-ft²/s²):	0.8667
Single Sandbag Mitigation	
Required Wall & Roof Thickness (in)	24
Expected Max. Throw Distance (ft):	125
Minimum Separation Distance (ft):	200
Double Sandbag Mitigation	
Required Wall & Roof Thickness (in)	Not Permitted
Expected Max. Throw Distance (ft):	Not Permitted
Minimum Separation Distance (ft):	Not Permitted

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):	1
TNT Equivalent Weight - Impulse (lbs):	2.150
Kinetic Energy 106 (lb-ft²/s²):	0.8667
Minimum Separation Distance (ft):	200.000
Water Containment System:	1100 gal tank

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):	225
MFD-H [Maximum Fragment Distance, Horizontal] (ft):	1379
MFD-V [Maximum Fragment Distance, Vertical] (ft):	1093

Overpressure Distances

TNT Equivalent (Pressure):	1
TNT Equivalent Weight - Pressure (lbs):	2.150
Unbarricaded Intraline Distance (3.5 psi), K18 Distance:	23
Public Traffic Route Distance (2.3 psi); K24 Distance:	31
Inhabited Building Distance (1.2 psi), K40 Distance:	52
Intentional MSD (0.0655 psi), K328 Distance:	423

Minimum Thickness to Prevent Perforation

	Intentional	Unintentional
4000 psi Concrete (Prevent Spall):	7.69	3.59
Mild Steel:	1.42	0.68
Hard Steel:	1.17	0.56
Aluminum:	2.92	1.46
LEXAN:	6.92	4.40
Plexi-glass:	5.28	2.89
Bullet Resist Glass:	4.46	2.28

Item Notes

Fragmentation Data Review Form

Database Revision Date 10/18/2011

Category:	Surface-Launched HE Rounds
Munition:	75 mm HE Mk I
Case Material:	Steel, Mild
Fragmentation Method:	Naturally Fragmenting
Secondary Database Category:	Projectile
Munition Case Classification:	Robust

DODIC:	
Date Record Created:	9/21/2004
Record Created By:	MC
Last Date Record Updated:	9/14/2011
Individual Last Updated Record:	SDH
Date Record Retired:	

Munition Information and Fragmentation Characteristics

Explosive Type:	TNT
Explosive Weight (lb):	1.64
Diameter (in):	2.9530
Cylindrical Case Weight (lb):	9.52000
Maximum Fragment Weight (Intentional) (lb):	0.2135
Design Fragment Weight (95%) (Unintentional) (lb):	0.0392
Critical Fragment Velocity (fps):	3468

Required Sandbag Thickness

TNT Equivalent (Impulse):	1
TNT Equivalent Weight - Impulse (lbs):	1.640
Kinetic Energy 10^6 (lb-ft²/s²):	1.2842
Single Sandbag Mitigation	
Required Wall & Roof Thickness (in)	24
Expected Max. Throw Distance (ft):	125
Minimum Separation Distance (ft):	200
Double Sandbag Mitigation	
Required Wall & Roof Thickness (in)	Not Permitted
Expected Max. Throw Distance (ft):	Not Permitted
Minimum Separation Distance (ft):	Not Permitted

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):	1
TNT Equivalent Weight - Impulse (lbs):	1.640
Kinetic Energy 106 (lb-ft²/s²):	1.2842
Minimum Separation Distance (ft):	200.000
Water Containment System:	1100 gal tank

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):	239
MFD-H [Maximum Fragment Distance, Horizontal] (ft):	1873
MFD-V [Maximum Fragment Distance, Vertical] (ft):	1425

Overpressure Distances

TNT Equivalent (Pressure):	1
TNT Equivalent Weight - Pressure (lbs):	1.640
Unbarricaded Intraline Distance (3.5 psi), K18 Distance:	21
Public Traffic Route Distance (2.3 psi); K24 Distance:	28
Inhabited Building Distance (1.2 psi), K40 Distance:	47
Intentional MSD (0.0655 psi), K328 Distance:	387

Minimum Thickness to Prevent Perforation

	Intentional	Unintentional
4000 psi Concrete (Prevent Spall):	7.22	3.71
Mild Steel:	1.40	0.72
Hard Steel:	1.15	0.59
Aluminum:	2.77	1.47
LEXAN:	7.36	4.86
Plexi-glass:	5.75	3.32
Bullet Resist Glass:	5.02	2.73

Item Notes

APPENDIX J
ARCHAEOLOGICAL TREATMENT PLAN

Archaeological Monitoring and Inadvertent Discovery Plan for Remedial Actions Associated with the Removal of Munitions and Explosives of Concern at Camp Bonneville, Washington

The following is a monitoring and inadvertent discovery plan intended to ensure the protection of archaeological objects, archaeological sites, and human remains during ground-disturbing remediation activities. The plan comes directly from the *Camp Bonneville Cultural and Historical Resources Protection Plan* which is Appendix C of the Final Remedial Action Unit 3 Cleanup Action Plan. Minor formatting and editing changes have been made to the original document to help this excerpt become a stand-alone document for the Phase I 14-inch below ground surface munitions and explosives of concern removal action in the Central Valley Floor and Associated Wetlands. The plan was modified to account for the Clark County response to question 49 (Is it the contractor's responsibility or the State of Washington's responsibility to provide Archeologists, Paleontologists, and or Scientists to oversee the project?) during the Request for Proposal timeframe that stated: "No, This is a regulatory/County function". *Camp Bonneville Cultural and Historical Resources Protection Plan* was authored by Lisa Folb, M.A., R.P.A. for the Bonneville Conservation, Restoration, and Renewal Team, November 2006 and updated May 2009.

This plan describes specific procedures to be followed in the event of the inadvertent discovery of archaeological objects, archaeological sites, or human remains. The plan has four components: Monitoring, Archaeological Awareness Training, Inadvertent Discovery Procedures, and Treatment of Human Remains.

1. MONITORING

The following monitoring protocol will be followed during all remediation actions that may result in ground-disturbing activity and the inadvertent discovery or disturbance of archaeological objects, archaeological sites, or human remains. The procedures described in Section 3 will be followed in the event of an inadvertent discovery of any archaeological resource. The procedures described in Section 4 will be followed in the event of an inadvertent discovery of human remains.

2. ARCHAEOLOGICAL AWARENESS TRAINING

A Professional Archaeologist will conduct archaeological awareness training for the entire Remediation Team prior to the commencement of any remediation action on Camp Bonneville. The training will familiarize cleanup personnel with the laws and regulations that protect archaeological objects, archaeological sites, and human remains; will aid cleanup personnel in the recognition of archaeological objects, archaeological sites, and human remains; will guide cleanup personnel in the procedures to be followed in the event of an inadvertent discovery; and will instruct cleanup personnel in the appropriate treatment of human remains. The training will include:

- Relevant Federal and Washington State Law (Revised Code of Washington, [RCW])
  - National Historic Preservation Act
  - Indian Graves and Records (RCW 27.44) http://apps.leg.wa.gov/rew/default.aspx?cite=27.44
  - Archaeological Sites and Resources (RCW 27.53) http://apps.leg.wa.gov/rew/default.aspx?cite=27.53
  - Human Remains (RCW 68.50)
  - Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60) http://apps.leg.wa.gov/rew/default.aspx?cite=68.60
- Recognition of archaeological objects, archaeological sites and human remains
- Previously recorded archaeological sites and isolated finds at Camp Bonneville
- Inadvertent discovery procedures
- Treatment of human remains

3. INADVERTENT DISCOVERY PROCEDURES

If any member of the Remediation Team believes that any archaeological object or archaeological site has been discovered, that person will stop work in the vicinity of the discovery and notify the Senior Unexploded Ordnance Supervisor (SUXOS). The SUXOS will investigate, and if the discovery is confirmed, the SUXOS will immediately stop all ground-disturbing activity within 100 feet of the discovery. Until the procedures described in this plan have been fully implemented, the SUXOS and the Remediation Team, on behalf of the interests of Clark County, will:

- Implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering;
- Take reasonable steps to ensure the confidentiality of the discovery site; and
- Take reasonable steps to restrict access to the site of discovery.

The SUXOS will notify a Professional Archaeologist, the Washington State Historic Preservation Officer (SHPO), and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one working day after the discovery. A Professional Archaeologist will inspect the discovery site as soon as possible, but no later than three working days after notification. If the Professional Archaeologist determines that the discovery is of no archaeological interest (e.g., artifacts or faunal remains less than 50 years of age), then the SUXOS may authorize ground-disturbing activity to recommence. The Professional Archaeologist will submit a letter report to SUXOS, the SHPO, and the Cowlitz Indian Tribe within 15 calendar days to document the investigation, including photographs of the discovery site and items discovered, and his or her determination that the discovery is of no archeological interest.

In the event that the discovery is determined to be of archaeological interest, the Professional Archaeologist will notify SUXOS, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one working day after the discovery is determined to be of archaeological interest. The notification will describe the nature of the archaeological objects or archaeological sites encountered and the circumstances of their inadvertent discovery. The notification will include the Professional Archaeologist's opinion, either:

- Sufficient information is available to determine that the archaeological resources are not eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity be permitted to recommence without further evaluation; or
- Additional archaeological test investigations are necessary to determine if the archaeological resources are eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity continue to be halted.

In the first instance, the SUXOS may authorize ground-disturbing activity to recommence after 30 days, unless the SHPO and/or the Cowlitz Indian Tribe provide a written request for further consultation within that period. In the event of a written request for further consultation, the procedures applicable to the second instance will apply.

In the second instance, the SUXOS, the SHPO and the Cowlitz Indian Tribe will consult in good faith to arrive at mutually-agreeable and appropriate measures that the SUXOS will employ to avoid or mitigate any adverse effects associated with continued ground-disturbing activities in the affected area. Consultation must result in a written plan of action in accordance with Washington state law between the Cowlitz Indian Tribe, the SHPO, and SUXOS. The SUXOS may elect to develop programmatic archaeological resource treatment plans in consultation with the SHPO and the Cowlitz Indian Tribe in advance of any remedial actions to minimize work stoppages in the event of an inadvertent discovery.

If the mitigation measures entail the excavation and removal of archaeological resources, the Professional Archaeologist will obtain a written permit for such activities in accordance with state law. Any mitigation measures to which the SUXOS, the SHPO and the Cowlitz Indian Tribe mutually agree shall be carried out solely at the expense of the contractor Bonneville Conservation Restoration and Renewal Team, LLC. The SUXOS will provide written notification (by email, fax or overnight mail) to the SHPO and the Cowlitz Indian Tribe when all mitigation measures have been completed. If no verbal or written response is received within three working days, the SUXOS may authorize ground-disturbing activity to recommence.

4. HUMAN REMAINS

Human remains will be treated with dignity and respect at all times.

If any member of the Remediation Team believes that any remains may have been discovered (whether believed to be human or non-human), that person will stop work in the vicinity of the discovery and notify the SUXOS. The SUXOS will investigate, and if the discovery is confirmed (whether believed to be human or non-human), the SUXOS will immediately stop all ground disturbing activity within 100 feet of the discovery. Until the procedures described in this plan have been fully implemented, the SUXOS and the Remediation Team, on behalf of the interests

of Clark County, will: implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; take reasonable steps to ensure the confidentiality of the discovery site; and take reasonable steps to restrict access to the site of discovery.

The SUXOS will notify the Clark County Sheriff's Office, a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one working day after the discovery. A Professional Archaeologist will inspect the discovery site as soon as possible, but no later than three working days after notification. If the Professional Archaeologist determines that the remains are demonstrably non-human, and there are no archaeological resources in association, then the SUXOS may authorize ground-disturbing activity to recommence. The Professional Archaeologist will submit a letter report to the SUXOS, the SHPO, and the Cowlitz Indian Tribe within 15 days to document the investigation, including photographs of the discovery site and the remains discovered. If non-human remains are determined to be in association with archaeological resources, then the procedures described in Inadvertent Discoveries, below, will be followed.

The Professional Archaeologist will notify the SUXOS immediately if archaeological excavations to expose the remains are necessary to aid in the determination. The SUXOS will notify the SHPO and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail) in advance of any such excavations. The SHPO and the Cowlitz Indian Tribe will be invited to observe the excavations. In the event that the Professional Archaeologist cannot determine whether the remains are human or non-human, the SUXOS will retain the services of a physical anthropologist or other qualified individual to assist in an in-field determination. Remains will be exposed only to the extent necessary to determine whether the remains are human, their cultural affiliation, antiquity, the number of individuals represented, their age, sex, stature, and to identify any pathologies or trauma evident. Measurements, observations and photographs of human remains and associated artifacts may be recorded; however, under no circumstances will any destructive testing take place without the express written consent of the SHPO.

If it is determined that the remains are demonstrably non-human, and there are no archaeological resources in association, then the SUXOS may authorize ground-disturbing activity to recommence. In this event, the Professional Archaeologist will submit a letter report to the SUXOS, the SHPO, and the Cowlitz Indian Tribe within 15 days to document the investigation, including photographs of the discovery site and the remains discovered. If it is determined that the remains are non-human, but are in association with archaeological materials, then the procedures described in Inadvertent Discoveries will be followed. If it is determined that the remains are human, the Professional Archaeologist will notify the Clark County Sheriff's Office, a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe. Notification will be made by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one working day after the remains are determined to be human. The notification will describe the nature of the human remains encountered and the circumstances of their inadvertent discovery. The notification will include the Professional Archaeologist's professional opinion concerning the likely cultural affiliation (whether Native American or non-Native American) based on the archaeological context, bioanthropological observations, and other relevant data. The notification will include the Professional Archaeologist's professional opinion, either:

1. Sufficient information is available to determine that the human remains are non-Native American and any associated archaeological resources are not eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity be permitted to recommence without further evaluation; or
2. Additional consultations are necessary to determine the custody, treatment and disposition of the Native American human remains; archaeological test investigations are necessary to determine if the associated archaeological resources are eligible for listing in the National Register of Historic Places; and recommending that ground-disturbing activity continue to be halted.

In the first instance, the SUXOS will consult with the Clark County Sheriff to determine the custody, treatment and disposition of the non-Native American human remains. If otherwise lawful, the SUXOS may authorize ground-disturbing activity to recommence after 30 days, unless the SHPO and/or the Cowlitz Indian Tribe provide a written request for further consultation within that period. In the event of a written request for further consultation, the procedures applicable to the second instance will apply.

In the second instance, the SUXOS, the SHPO and the Cowlitz Indian Tribe will consult in good faith to arrive at mutually-agreeable and appropriate measures that the SUXOS will strive to avoid or mitigate any adverse effects associated with continued ground-disturbing activities in the affected area, and to determine the custody, treatment and disposition of the Native American human remains. Consultation must result in a written plan of action in accordance with Washington state law between the Cowlitz Indian Tribe, SHPO, and the SUXOS. The SUXOS may elect to develop programmatic plans for the treatment of archaeological resources and human remains in consultation with the SHPO and the Cowlitz Indian Tribe in advance of any remedial actions to minimize work stoppages in the event of an inadvertent discovery.

If the mitigation measures entail the excavation and removal of archaeological resources or human remains, the Professional Archaeologist will obtain a written permit for such activities in accordance with RCW 27.53 "Archaeological Sites and Resources." Any mitigation measures to which the SUXOS, the SHPO and the Cowlitz Indian Tribe mutually agree shall be carried out solely at the expense of Clark County. The SUXOS will provide written notification (by email, fax or overnight mail) to the SHPO and the Cowlitz Indian Tribe when all mitigation measures have been completed. If no verbal or written response is received within three working days, the SUXOS may authorize ground-disturbing activity to recommence.

4.1 INTRUSIVE ACTIVITIES

The cleanup actions at the Camp Bonneville Military Reservation will include intrusive activities to 14 inches below ground surface. Intrusive activities will consist of the following four steps:

1. An initial survey clearance to find and remove anomalies (anomaly avoidance) conducted for worker safety during subsequent clearance activities.
2. Brush removal to make the surface visible and accessible.
3. A second instrument-aided surface clearance to confirm that surface munitions and explosives of concern and munitions debris items have been identified and removed.
4. Limited excavation with munitions and explosives of concern identification support to find and remove munitions and explosives of concern items from below the site surface to the specified depth.
5. If any member of the Remediation Team believes that any archaeological object or archaeological site has been discovered, that person will stop work in the vicinity of the discovery and notify the SUXOS. The SUXOS will investigate, and if the discovery is

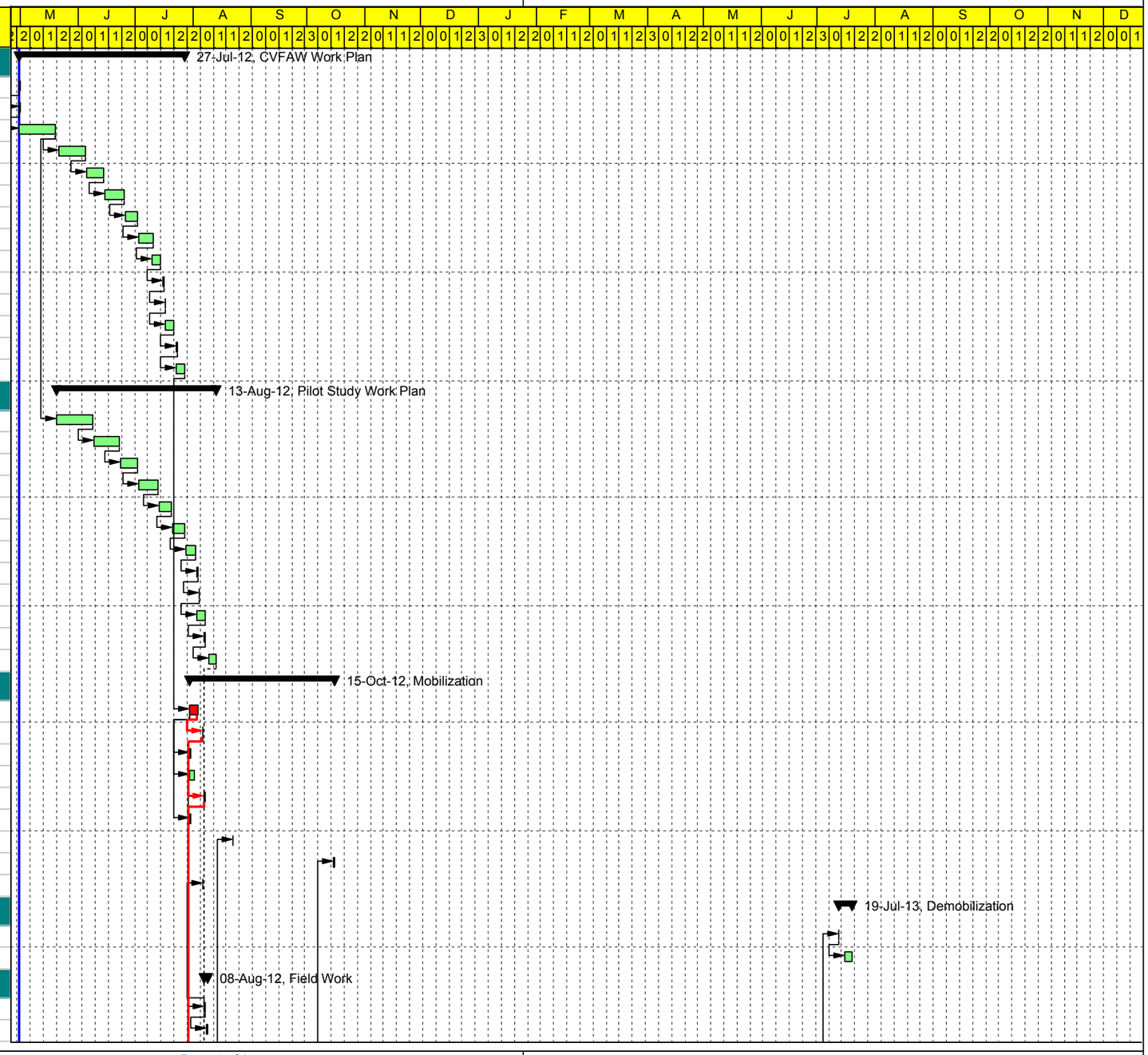
confirmed, the SUXOS will immediately stop all ground-disturbing activity within 100 feet of the discovery. Archaeological Awareness Training, Inadvertent Discovery Procedures, and Human Remains protocols will be implemented during any cleanup activities in accordance with Section 3.0.

APPENDIX K
PERMITS AND SUBCONTRACTS

Weston Solutions, Inc. is in the process of assessing the need for the following natural resources protection permits: *Habitat Conservation Permit* (or equivalent) in accordance with the Habitat Conservation Ordinance. *Wetlands Conservation Permit* (or equivalent) prior to implementation of remedial activities in the wetlands adjacent to Lacamas Creek in accordance with the Wetland Conservation Ordinance administered by Clark County. *Section 404 Permit* from the U.S. Army Corps of Engineers (USACE) for work within federally regulated wetland areas. We anticipate Nationwide Permit 38 will be applicable. *Grading Permit* (or equivalent) is not anticipated, but will be obtained for any activity requiring significant land movement or grading. The required permits will be presented in the Final Work Plan for the CVFAW Remedial Action effort.

APPENDIX L
PROJECT SCHEDULE

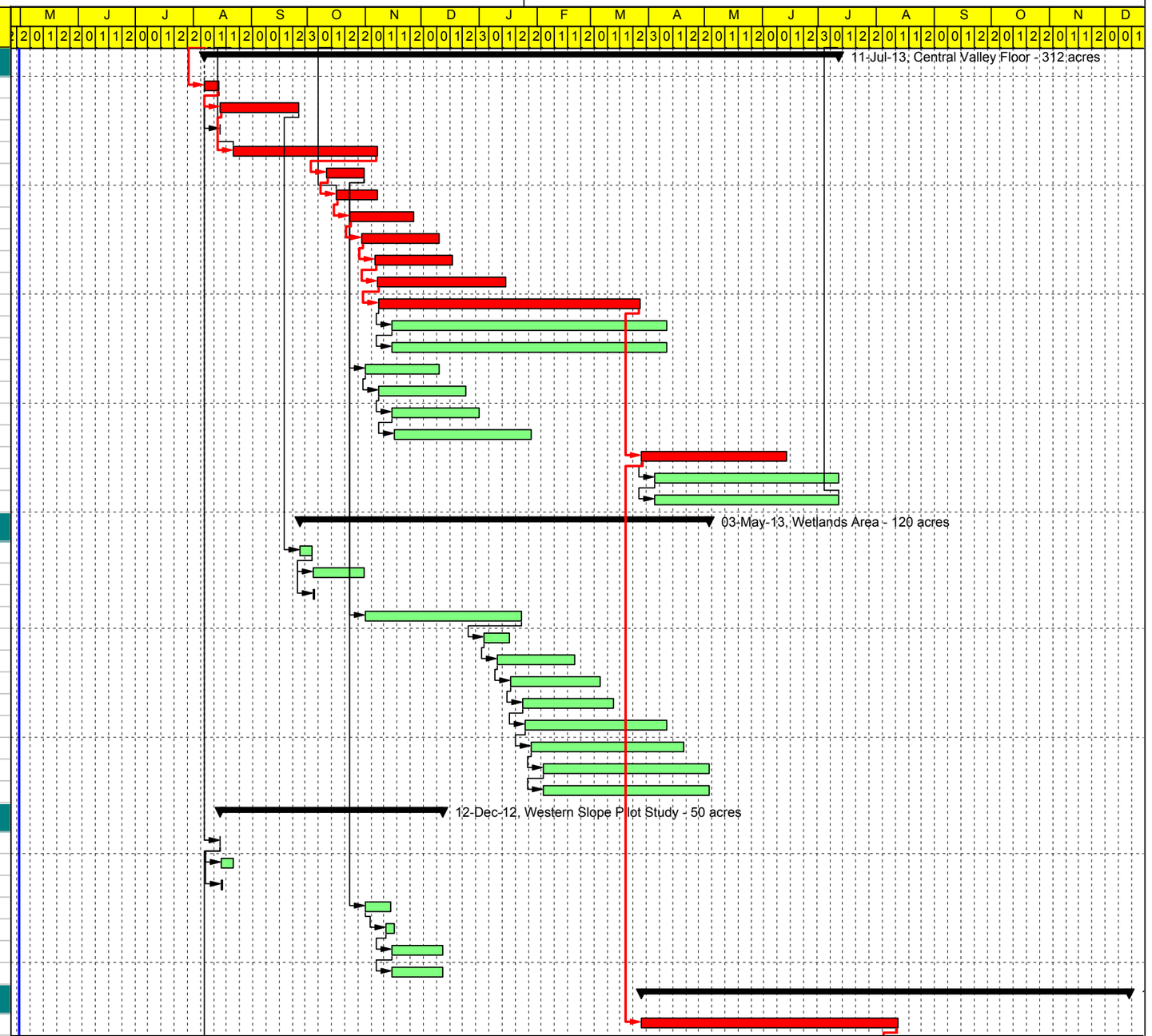
Activity ID	Activity Name	Original Duration	Start	Finish
CVFAW Work Plan		65	30-Apr-12	27-Jul-12
100.000	Contract Award	1	30-Apr-12	30-Apr-12
100.005	Camp Bonneville Kick-Off/TPP Meeting	1	30-Apr-12	30-Apr-12
100.010	Prepare/Submit Draft Work Plan (Weston)	20	30-Apr-12	19-May-12
100.020	Stakeholder Review/Comment-Draft Work Plan	15	21-May-12	04-Jun-12
100.030	Incorporate Comments/Submit Draft Final WP (Weston)	10	05-Jun-12	14-Jun-12
100.040	Stakeholder Review/Comment-Draft Final WP	11	15-Jun-12	25-Jun-12
100.050	Incorporate Comments-Red Line (Weston)	7	26-Jun-12	02-Jul-12
100.060	Stakeholder Review Red Line Response to Comments	7	03-Jul-12	10-Jul-12
100.070	Resolve Red Line Comments (Weston)	5	10-Jul-12	14-Jul-12
100.080	Stakeholder TPP Meeting-Approve Draft Final WP	1	16-Jul-12	16-Jul-12
100.090	90-day Public Review/Comment Period	0	17-Jul-12	17-Jul-12
100.100	Resolve Public Comments (Weston)	5	17-Jul-12	21-Jul-12
100.110	Submit Final Work Plan to Stakeholders	1	23-Jul-12	23-Jul-12
100.120	Stakeholders Approval of Final Work Plan	5	23-Jul-12	27-Jul-12
Pilot Study Work Plan		85	20-May-12	13-Aug-12
100.200	Prepare/Submit Draft Work Plan (Weston)	20	20-May-12	08-Jun-12
100.210	Stakeholder Review/Comment on Draft WP	14	09-Jun-12	22-Jun-12
100.220	Incorporate Comments/Submit Draft Final WP (Weston)	10	23-Jun-12	02-Jul-12
100.230	Stakeholder Review/Comment Draft Final WP	10	03-Jul-12	13-Jul-12
100.240	Incorporate Comments Red Line (Weston)	7	14-Jul-12	20-Jul-12
100.250	Stakeholder Review Red Line RTC	7	21-Jul-12	27-Jul-12
100.260	Resolve Red Line Comments (Weston)	6	28-Jul-12	02-Aug-12
100.270	Stakeholder TPP Meeting-Approve Draft Final WP	1	03-Aug-12	03-Aug-12
100.280	90-day Public Review & Comment Period	0	04-Aug-12	04-Aug-12
100.290	Resolve Public Comments (Weston)	5	03-Aug-12	07-Aug-12
100.300	Submit Final Work Plan to Stakeholders	1	07-Aug-12	07-Aug-12
100.310	Stakeholders Approval of Final Work Plan	5	09-Aug-12	13-Aug-12
Mobilization		56	30-Jul-12	15-Oct-12
200.000	Mobilization	5	30-Jul-12	03-Aug-12
200.010	Entrance Brief	1	06-Aug-12	06-Aug-12
200.020	Mobilize Field Mgt & Office Personnel	1	30-Jul-12	30-Jul-12
200.030	Field Office set up & Site prep	3	30-Jul-12	01-Aug-12
200.040	Mobilize Survey crew	1	07-Aug-12	07-Aug-12
200.050	Mobilize UXO Techs for survey & escort	1	30-Jul-12	30-Jul-12
200.060	Mobilize Brush Cutters	1	22-Aug-12	22-Aug-12
200.070	Mobilize UXO Techs for Surface Clearance, Reacquire...	1	15-Oct-12	15-Oct-12
200.075	Mobilize Geophysical personnel	1	06-Aug-12	06-Aug-12
Demobilization		6	12-Jul-13	19-Jul-13
200.080	Exit Brief	1	12-Jul-13	12-Jul-13
200.090	Demobilize Field Office/Equip/Crew/Staff	5	15-Jul-13	19-Jul-13
Field Work		2	07-Aug-12	08-Aug-12
300.010	Select & Install Geophysical Test Plot	1	07-Aug-12	07-Aug-12
300.020	Demonstrate & evaluate procedures/equpmnt in Geop...	1	08-Aug-12	08-Aug-12



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

APPENDIX L - PROJECT SCHEDULE

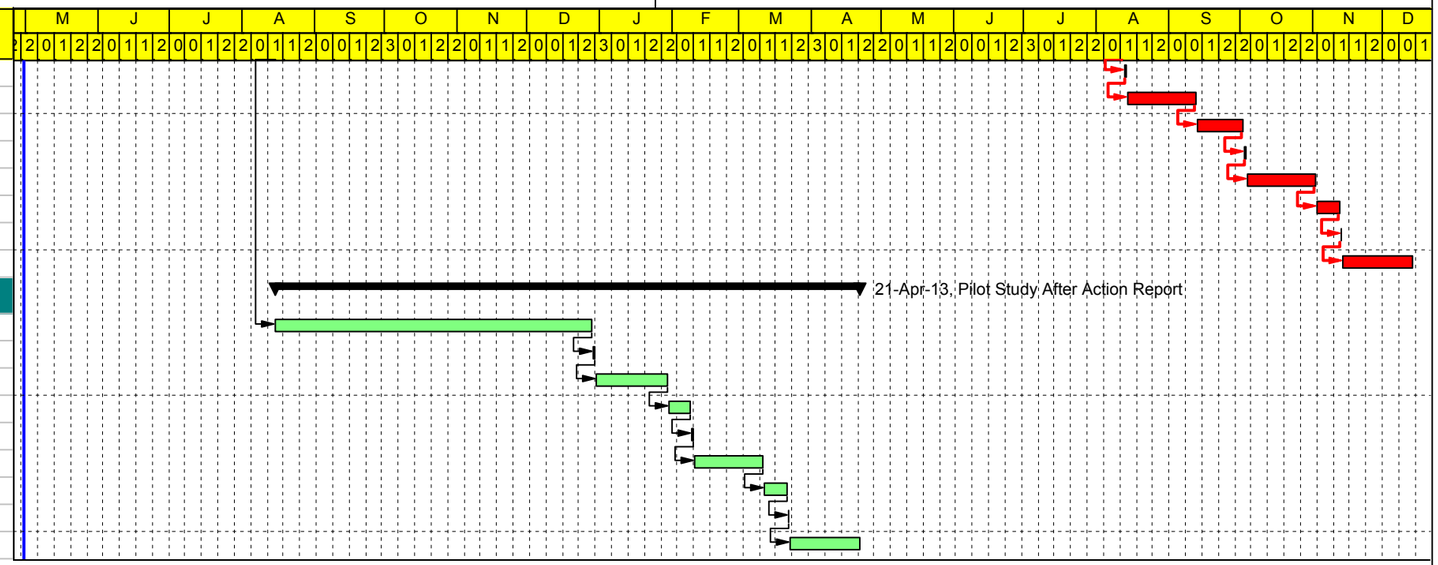
Activity ID	Activity Name	Original Duration	Start	Finish
Central Valley Floor - 312 acres		243	07-Aug-12	11-Jul-13
300.100	Professional survey CVF Boundary & Control Points	6	07-Aug-12	14-Aug-12
300.110	Stakeout CVF grids	31	15-Aug-12	26-Sep-12
300.120	Submit survey data	1	15-Aug-12	15-Aug-12
300.130	Brush cutting in CVF grids (282 ac) (mechanical)	56	22-Aug-12	07-Nov-12
300.140	Brush Cutting CVF grids (30 ac) (hand cut)	15	11-Oct-12	31-Oct-12
300.150	Surface sweep pre-DGM (312 acres)	17	16-Oct-12	07-Nov-12
300.160	Conduct DGM survey of CVF Phase 1 (200 ac)	25	23-Oct-12	26-Nov-12
300.170	Process DGM data & Dig List prep Phase 1	30	30-Oct-12	10-Dec-12
300.180	ASB Weekly Review - Phase 1 area	30	06-Nov-12	17-Dec-12
300.190	Reacquire DGM targets in CVF - Phase 1 area	49	07-Nov-12	14-Jan-13
300.200	Excavate DGM targets in CVF - Phase 1 area	100	08-Nov-12	27-Mar-13
300.210	QC1 of DGM targets in CVF - Phase 1 area	105	15-Nov-12	10-Apr-13
300.220	Clark County QA, as necessary - Phase 1 area	105	15-Nov-12	10-Apr-13
300.230	Conduct DGM survey of CVF Phase 2 (112 ac)	28	01-Nov-12	10-Dec-12
300.240	Process DGM data & Dig List prep Phase 2	33	08-Nov-12	24-Dec-12
300.250	ASB Weekly Review - Phase 2 area	33	15-Nov-12	31-Dec-12
300.260	Reacquire DGM targets in CVF - Phase 2 area	52	16-Nov-12	28-Jan-13
300.270	Excavate DGM targets in CVF - Phase 2 area	56	28-Mar-13	13-Jun-13
300.280	QC1 of DGM targets in CVF - Phase 2 area	71	04-Apr-13	11-Jul-13
300.290	Clark County QA, as necessary - Phase 2 area	71	04-Apr-13	11-Jul-13
Wetlands Area - 120 acres		157	27-Sep-12	03-May-13
300.300	Professional survey wetland boundary (120 acres)	5	27-Sep-12	03-Oct-12
300.310	Stakeout wetland grids	20	04-Oct-12	31-Oct-12
300.320	Submit survey data	1	04-Oct-12	04-Oct-12
300.330	Brush cutting in wetlands (hand cut area)	60	01-Nov-12	23-Jan-13
300.340	Surface sweep pre-DGM	10	03-Jan-13	16-Jan-13
300.350	Conduct DGM survey of wetlands (100 acres)	30	10-Jan-13	20-Feb-13
300.360	Process DGM data & Dig List prep	35	17-Jan-13	06-Mar-13
300.370	ASB weekly review - Phase 2 area	35	24-Jan-13	13-Mar-13
300.380	Reacquire DGM targets in wetlands	54	25-Jan-13	10-Apr-13
300.390	Excavate DGM targets in wetlands	60	28-Jan-13	19-Apr-13
300.400	QC1 of DGM targets in wetlands	65	04-Feb-13	03-May-13
300.410	Clark County QA, as necessary	65	04-Feb-13	03-May-13
Western Slope Pilot Study - 50 acres		86	15-Aug-12	12-Dec-12
300.500	Profess. survey pilot study control pts (50 ac)	1	15-Aug-12	15-Aug-12
300.510	Stakeout pilot study areas	5	16-Aug-12	22-Aug-12
300.520	Submit survey data	1	16-Aug-12	16-Aug-12
300.530	Brush cutting in pilot study areas (mechanical)	10	01-Nov-12	14-Nov-12
300.540	Surface clearance in pilot study areas	5	12-Nov-12	16-Nov-12
300.550	QC of pilot study areas	20	15-Nov-12	12-Dec-12
300.560	Clark County & WDOE QA, as necessary	20	15-Nov-12	12-Dec-12
CVFAW After Action Report		260	28-Mar-13	13-Dec-13
400.000	CVFAW Draft AAR	137	28-Mar-13	12-Aug-13



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

APPENDIX L - PROJECT SCHEDULE

Activity ID	Activity Name	Original Duration	Start	Finish
400.010	Submit Draft AAR	1	13-Aug-13	13-Aug-13
400.020	Review Draft AAR	30	14-Aug-13	12-Sep-13
400.030	Incorporate comments	20	13-Sep-13	02-Oct-13
400.040	Submit Draft Final Draft AAR	1	03-Oct-13	03-Oct-13
400.050	Review Draft Final Draft AAR	30	04-Oct-13	02-Nov-13
400.060	Incorporate Comments	10	03-Nov-13	12-Nov-13
400.070	Submit Final AAR Electronically	1	13-Nov-13	13-Nov-13
400.080	Stakeholder Approval of Final AAR	30	14-Nov-13	13-Dec-13
Pilot Study After Action Report		248	15-Aug-12	21-Apr-13
400.200	Pilot Study Draft AAR	135	15-Aug-12	28-Dec-12
400.210	Submit Draft AAR	1	29-Dec-12	29-Dec-12
400.220	Stakeholder Review Draft AAR	30	30-Dec-12	29-Jan-13
400.230	Incorporate comments	10	30-Jan-13	08-Feb-13
400.240	Submit Draft Final AAR	1	09-Feb-13	09-Feb-13
400.250	Stakeholder Review Draft Final AAR	30	10-Feb-13	11-Mar-13
400.260	Incorporate Comments	10	12-Mar-13	21-Mar-13
400.270	Submit Final AAR Electronically	1	22-Mar-13	22-Mar-13
400.280	Stakeholder Approval of Final AAR	30	23-Mar-13	21-Apr-13



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

APPENDIX L - PROJECT SCHEDULE