# APPENDIX C

## SCOPE OF WORK

**STATEMENT OF WORK**

**EASTERN BYPASS**

**ENGINEERING EVALUATION/**

**COST ANALYSIS (EE/CA)**

**AT**

**FORT MCCLELLAN**

**FORT MCCLELLAN, ALABAMA**

**ANNEX E**

**May 26, 1998**

1.0 **OBJECTIVE.** The objective of this task order is to perform an Engineering Evaluation/Cost Analysis (EE/CA) for the proposed Eastern Bypass area at the Fort McClellan Army Depot, Fort McClellan, Alabama.

2.0 **BACKGROUND.**

2.1 General.

2.1.1 The work required under this Scope of Work (SOW) falls under the Base Realignment and Closure. Ordnance and Explosives (OE) and OE-related scrap contamination is suspected to exist on this property owned by the Department of the Army.

2.1.2 OE is a safety hazard and may constitute an imminent endangerment. Unexploded ordnance (UXO) may be buried on the site or may possibly be on the ground surface. Chemical Warfare Materiels (CWM) is not suspected to exist within the limits where this work will be performed although CWM was stored at Fort McClellan. However, if any suspect CWM is discovered, the Architect-Engineer (A-E) should stop work immediately, withdraw from the area, and notify the Fort McClellan EOD Unit. The work done under this SOW will be performed in substantial compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104, and the National Contingency Plan (NCP) Sections 300.120(c) and 300.400(e). The Architect-Engineer (A-E) shall provide the UXO specialist(s). No Federal, State, or Local permits are required for any access or remedial action taken on this site. The applicable provisions of 29 CFR 1910.120 shall apply.

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

2.3 Site History. Fort McClellan has been used for artillery training of troops and the National Guard as early as 1912 to present day. In 1941, McClellan became site of the Chemical Corps Training Command. In 1962, the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency moved to Fort McClellan. In 1973, the Chemical Corps School along with the U.S. Army Combat Developments Command Chemical Biological-Radiological Agency closed. In 1979, the U.S. Army Chemical Corps School re-established along with a training Brigade for Basic Training.

2.4 Eastern Bypass. The proposed Eastern Bypass route begins on the western boundary of the installation in the vicinity of Summerall Gate and heads due east approximately one (1) mile then turns due south for approximately 3.5 miles to the southern boundary. The area within the easement of the proposed bypass is approximately 250 acres but the A-E shall include areas within 1250 feet of the easement boundaries in this EECA. The proposed bypass route passes through an OE impact area in the vicinity of Iron Mountain. At this time no evidence of OE other than small arms has been found in other areas of the proposed bypass.

3.0 **SPECIFIC REQUIREMENTS**

3.1 (TASK 1) SITE VISIT and RECORDS REVIEW. The A-E shall make a site visit, review pertinent maps, records, and documents. The Government shall provide aerial photograph interpretation as well as previously prepared documents and reports. The purpose of this task is to permit those members of the A-E with direct project responsibility to gain necessary information about site conditions. A site visit is authorized to assist in preparing the work plan. The site visit team shall not exceed four (4) persons and shall include one (1) Senior UXO Supervisor. The A-E will coordinate the site visit with the Contracting Officer (CO) 10

days prior to arriving on site. The A-E will prepare an abbreviated SSHP and submit it to the CO for review and approval prior to the visit. The format for the abbreviated SSHP will be provided by CEHNC. The A-E shall ensure that the site visit is fully coordinated and that all members of the site visit team maintain compliance with the abbreviated SSHP.

3.2 (TASK 2) GROUND RECONNAISSANCE. The A-E shall perform ground reconnaissance to identify areas of possible OE contamination which are not documented within the area of the proposed bypass. This portion of the work shall be performed prior to the work plan in order to select areas for placement of grids to be geophysically mapped and possibly sampled. The ground reconnaissance team shall consist of a minimum of three (3) persons and shall include one (1) UXO Safety Specialist. The A-E shall examine the ground surface for evidence of OE. The A-E shall supply handheld equipment for detecting subsurface anomalies, which could indicate presence of OE. The A-E shall identify locations of areas suspected of containing OE contamination with sufficient accuracy for later placement of 100' by 100' grids within the suspect area. The A-E shall be required to submit a safety plan for government approval prior to any field activities. No intrusive activities shall be performed on this site during this phase of work.

3.3 (TASK 3) PREPARE WORK PLANS.

3.3.1 Work Plan. The A-E shall prepare and submit a work plan for this project. The work plan shall describe in detail the site background and history, investigation objectives, all proposed investigative activities, equipment, procedures, personnel, and schedule. The work plan shall propose site locations and the anticipated work that shall be conducted. The work plan shall include sub-plans and standing operating procedures (SOPs).

3.3.2 Health and Safety Program (HSP). The A-E shall develop and maintain a Health and Safety Program in compliance with the requirements of OSHA standard 29 CFR 1910.120(b)(1) through (b)(4). The A-E will submit to the CO written certification that

the HSP has been developed and implemented and the plans shall be made available upon request. The A-E shall develop a Site-Specific Safety and Health Plan (SSHP) IAW the requirements of Paragraph 7.0 of this SOW. The A-E shall include exposure concerns associated with this SOW. An abbreviated SSHP is not acceptable for the base document. The A-E will submit the SSHP to the CO for approval prior to beginning any fieldwork described in this task. He will perform all work IAW the approved plan. Due to the inherent risk of UXO work, UXO related activities shall be limited to a 40-hour workweek (either five 8-hour or four 10-hour days). UXO personnel shall not perform UXO-related tasks for more than 10 hours per day.

3.3.3 Site Mobilization/Demobilization and Support Plan. The A-E shall prepare a plan that details mobilization/demobilization activities. These activities shall be those actions necessary to prepare the site for work prior to the arrival of the work crews, and those actions necessary to shut down the site at demobilization. Such activities shall include but are not limited to communications, power to site office(s), arrangement for office(s), sanitary requirements, lodging arrangements, explosive acquisition and storage, and demolition area preparation.

3.3.4 Conventional Safe Holding Area (SHA) Plan. The A-E shall plan for a Safe Holding Area on the site. The A-E shall include provisions for fire fighting, security, and other requirements for establishing and operating a Safe Holding Area. The SHA shall be designed to safely store explosives needed to perform demolition work and to safely store recovered conventional ordnance awaiting destruction.

3.3.5 Intrusive Excavation Plan. The A-E shall prepare and submit an intrusive excavation plan. This portion of the work plan shall propose methods for excavating soil down to the anomalies as defined in the geophysical report as well as discussions of equipment, Personnel Protective Equipment (PPE), materials, personnel, and procedures to be used during intrusive excavations.

3.3.6 Geophysical Investigations Plan.

3.3.6.1 The geophysical investigations shall be managed by a qualified geophysicist (i.e., an individual with a degree in geophysics, geology, geological engineering, or closely related field, and who has a minimum of five years of directly related geophysical experience).

3.3.6.2 As part of the work plan the A-E shall prepare a site-specific Geophysical Investigation Plan that describes and justifies proposed equipment, methods, personnel and procedures for accomplishing geophysical investigations at the site. The geophysical instruments shall be capable of detection in accordance with the following performance goals:

**PERFORMANCE GOALS OF GEOPHYSICAL INVESTIGATIONS**

$$\log(\text{depth}) = 1.002 \log(\text{diameter}) - 1.961 \qquad \text{EQ 1}$$

Field instruments shall be field tested daily to ensure that they are operating properly. The A-E shall identify in the work plan, for Government approval, the type of inert round or very similar magnetic inert item that shall be planted, and the specified depth. If an instrument does not meet the standard during the daily check, it shall be calibrated, repaired, or replaced.

3.3.6.3 The proposed geophysical and other field instruments shall be evaluated at the project site to document equipment capabilities, and to confirm that the most appropriate tools and techniques are being employed on this project. The AE shall prepare and submit to HNC a detailed draft Geophysical Work Plan prior to the Site Specific Geophysical Prove Out. The experience gained from the Site Specific Geophysical Prove Out and the resulting recommendations shall be incorporated into the draft Geophysical Work Plan using slip pages. The resulting document will become the Geophysical Work Plan. The draft Work Plan shall propose the equipment and methodologies to be employed to perform all necessary operations. Subdivisions within the draft Geophysical Work Plan shall include:

- Sensors: Selected geotechnical sensor parameters, required

data corrections and data logging techniques.

- Sensor Mobility: mobility power source, speed, special considerations,
- Data Storage: sensor internal storage, external storage and any special data transfer requirements shall be addressed.
- Data analysis and interpretation techniques.

The Site Specific Prove Out Grid selected during the site visit shall be cleared of man made objects to a depth of not less than [10 feet]. Using the list of suspected OE described in the Archive Search Report, representative OE or similar items shall be buried at appropriate depths in the Site Specific Prove Out Grid. Geophysical equipment and techniques should be capable of achieving the performance goals in Equation 1. The standard response of each geophysical instrument and associated field equipment shall be determined. The capabilities of each instrument shall be characterized to enable the contractor to recommend to HNC the most appropriate geophysical instrument and methodology for this project. Specific recommendations of the most appropriate field equipment and methodologies shall be presented in a Letter Report to HNC. The selection of the geophysical instrument and methodology for this project shall be the joint responsibility of HNC and the contractor. The geophysical instrument(s) selected shall be checked for a standard response prior to surveying each grid. If equipment does not meet the standard performance criteria defined above, the AE shall perform repairs, provide alternate equipment selections, correct settings, or revise calibration approaches and retest for criteria achievement until sufficient performance is demonstrated.

3.3.7 Community Relations Plan. The A-E shall support preparation of a plan for community relations. The US Army Corps of Engineers, Mobile District's (CESAM) public affairs personnel and CEHNC shall prepare the plan.

3.4 (TASK 4) BRUSH CLEARING and SURFACE DEBRIS REMOVAL. The A-E

shall remove surface debris at those sites identified and approved in the work plan for the purpose of defining and redefining anomalies. The A-E shall clear brush and surface debris/scrap metal prior to geophysical surveys. All necessary brush and vegetation up to a size of three (3) inches in diameter shall be removed. Scrap metal and debris shall be disposed of at a local scrap dealer and local landfill. The debris disposal or relocation shall be stated in the work plan.

3.5 (TASK 5) GEOPHYSICAL MAPPING DATA. Following the removal of brush and surface debris, the A-E shall use the approved geophysical mapping technology. The technology shall digitally capture the instrument readings into a file coincident with the Alabama State plane grid coordinates. Navigation and instrument position shall be based on established grid corner points and monuments. This field data shall be checked, corrected, and processed into ASCII files in the ADF file format. Corrections such as for navigation, instrument bias, and diurnal magnetic shift shall be applied but there shall be no filtering or normalization of the data. All corrections shall be documented. The data shall be presented in delineated fields as "X, Y, and Z" where "X" and "Y" are local State Grid Plane Coordinates in Eastings and Northings and "Z" is the instrument reading. Where there are multiple instrument values such as with the EM instruments then the channels shall be provided in separate ADF files. The data shall be provided in processing block files that approximates a ground area of 400 ft. by 400 ft. or as determined during the geophysical prove-out. This digital data shall be provided to the Government by Internet connection to the CEHNC OE server within 48 hours from the completion of the geophysical mapping. A Word file that documents the field activities associated with the data shall accompany all field data and the processing performed. Additional data such as scanned photos, annotated CADD, and mapping data shall be provided to accurately document field activities. The locations of the day's work shall be represented either by outlining the limits on a coincident CADD

file representing the area or by a scanned hard copy map. An archive copy on PC-CD ROM format shall be provided to CEHNC with receipt within seven (7) days from completion of the survey.

3.6 (TASK 6) SAMPLING.

3.6.1 The AE shall provide all necessary personnel and equipment to perform OE sampling at the site. The AE shall use the Government furnished statistical anomaly selection computer program provided by the Government in order to determine the amount of anomaly excavation required in each grid. The purpose of anomaly excavation is to determine the presence and nature of OE contamination. All anomalies need not necessarily be excavated. The statistical evaluation program shall be used to ensure that the grids are statistically characterized through minimal excavations. Results from geophysical investigations shall be utilized to complete statistical determinations, which will identify anomalies to be excavated. The AE shall dispose of all OE excavated or otherwise located during this investigation, however no demolitions shall be performed that may jeopardize any historical or archeological structure or location. The AE shall excavate to a depth of three feet to determine the identity of selected magnetic anomalies. If deeper excavation is required, the on-site Huntsville Center Safety specialist or the Project Manager will make the decision.

3.6.3 Only USAESCH approved UXO personnel shall perform OE-related tasks.

3.6.4 The A-E shall maintain a detailed accounting of all OE items/components encountered. This accounting shall include the amounts of OE, identification, condition, depth located, disposition and location/mapping. This accounting shall be a part of the EECA.

3.6.5 An accountability system shall be used to account for all demolition materials expended in the disposal of OE.

3.6.6 If a scenario is encountered that precludes detonating an OE on site (i.e. an unidentifiable OE is found, or a suspected toxic chemical munitions is found) the on-site USAESCH Safety

Specialist shall be notified, who in turn will request EOD Support.

3.6.7 The A-E shall plan to provide demolition materials for disposal of OE items and storage facilities for demolition materials. This shall be outlined in the WP.

3.6.8 If an excavation is required in an area of an endangered/ protected plant or animal, excavation shall proceed only after approval by the proper officials.

3.6.9 Approval by USAESCH Safety is required for OE disposal and schedule for destruction.

3.6.10 All access/excavation/detonation holes shall be back-filled.

3.7 (TASK 7) PUBLIC AFFAIRS. The A-E shall assist CEHNC Public Affairs Office (PAO) and the Corps of Engineers, Mobile District (CESAM) PAO in developing and executing a Public Affairs program to include public meetings and Restoration Advisory Board (RAB) meetings. A press release will be issued by CESAM/CEHNC to update the local residents of the on-going activity and any activity that is planned for the immediate future. Future plans, unless definitely approved by DA, Deputy Chief of Staff for Operations (DCSOPS), will not be discussed or speculated upon.

3.8 (TASK 8) LOCATION SURVEYS and MAPPING.

3.8.1 UXO Safety. The A-E shall provide the survey and mapping requirements detailed in this SOW. The approved Work Plan does not take precedence over this SOW. During all field and intrusive activities, an UXO specialist shall accompany the survey crew. The UXO specialist shall conduct visual UXO surveys for surface ordnance prior to the survey crew entering a suspect area and a magnetometer survey of each intrusive activity site to ensure that the site is anomaly free prior to the survey crew driving stakes, or establishing other points. Based on site conditions, it is possible that an EOD escort will not be required in all areas at all times after the initial site visit. However, such a decision will be made jointly by the on-site Safety Officer and the USAESCH Safety Specialist who may rescind or modify the

decision at any time.

3.8.2 All location survey and mapping required by this Task Order shall be conducted and/or supervised by a Registered or Professional Land Surveyor (RLS/PLS) registered and licensed by the State of Board of Registration for Professional Engineers and Land Surveyors in the State of Alabama. All maps and drawings required by this SOW shall be sealed and signed by the RLS/PLS.

3.8.3 Horizontal and Vertical Control. No additional monuments shall be required for this project.

3.8.4 Location Survey. The boundary corners and individual corners within the areas being investigated shall be established using precision surveying methods. Each corner on the boundary of the area shall be set with a two-to four-foot long, 3/4-inch pipe or 3/8-inch rebar, along with a guard stake that is painted with high visibility pink or orange paint. Each of these corners shall be located to the closest one-hundredth of a foot (0.01-ft) and referenced to Alabama State Plane Coordinate System (Alabama East) the North American Datum of 1983 (NAD83). No other coordinate system shall be acceptable. Each corner of the 100-foot by 100-foot grid sampling corner shall be set with a 2"x2" hub and located to the closest 1.0 ft. Each of these corners shall also be referenced to Alabama State Plane Coordinate System (Alabama East) NAD83.

3.8.5 Mapping. The A-E shall be provided with planimetric maps for each area that will be investigated for the project. Each corner of each area being investigated and each 100' x 100' grid sampling point shall be plotted on these maps. State plane grid coordinates for each large area shall be shown at each corner. Coordinates for the corner of each grid sampling point area are not required on the 1 in=200 ft. maps. Individual maps for each grid sampling area that is being investigated for OE shall also be prepared at a scale of one inch = 20 feet (1" = 20') or larger. The final maps of these grid-sampling areas shall be provided on 8 ½-inch by 11-inch bond paper. All of these corners shall be used as the basis for geophysical mapping, navigation, and OE sampling.

The staked grid locations and corner coordinates shall be compiled into a CADD file to reference for overlay with the base mapping data. This file shall include unique grid names and each corner coordinate staked. All grids and corner coordinates shall be tabulated into an Excel spreadsheet for future use during geophysical mapping and sampling. This data shall be compiled during staking operations to provide digital representations within 48 hours after completion of field activities. The 1"=20' maps shall indicate the number of each verified surface UXO and each subsurface geophysical anomaly within the grid. Other notable features within the grid shall also be sketched in.

3.8.6 Final Mapping. All final mapping shall be created by Computer-Aided Design and Drafting (CADD) Personal Computers (PC) and provided to the Government in Microstation 5.0 two-dimensional digital design files on PC CD-ROM (see paragraph 3.15.7). All characteristics such as file naming and relationships, level structures, colors, line styles, weights, etc., in accordance with the surveying and mapping requirements of the Tri-Service Spatial Data Standards (TSSDS) of the current release shall be compiled in the design files. Site maps plotted from these design files shall be provided on reproducible (Mylar) standard metric A-1 size drawings which are 841 millimeters (mm) by 594 mm (33.1 inches, 23.4 inches) in size. The location, identification, and coordinates of all the control points and boundary corners shall be plotted on the reproducible (Mylar) maps. Each control point shall be identified on the map by its name or number and the final adjusted coordinates and elevations (to the closest 0.01-ft). Each map shall include a grid north, a true north, and magnetic north arrow with the differences between them shown in minutes and seconds. Grid lines or tick marks in feet and at systematic intervals shall be shown with their grid values on the edges of the map. Also, a legend showing the standard NGS symbols used for the mapping, a map index showing the site in relationship to all other sites within the boundary lines of the project area, a border, and a standard COE title block

shall be shown on each map.

3.8.7. Hardware and Software Platform and Computer Files. All final text files generated by the A-E under this Task Order shall be Word 6.0, IBM PC-compatible format. The basic software supported to the field shall be capable of operating on a typical single Intel Pentium processor PC using the Windows NT version 3.51 operating system with a minimum of 32 megabytes of memory and adequate disk storage for the project data. All in-progress and fielded data, design drawings, survey data, relational databases, and related data generated shall be available on-line to the Government through the use of the Internet connection. Formal submittals shall be in the proper format and media which will permit their loading, storage, and use with modification or additional software on the USAESCH Geographic Information System (GIS) workstations. The base GIS workstations consist of Intergraph TD-4 Intel dual-Pentium GIS machines with 96 megabytes of memory. The workstations run under the Windows NT 3.51 operating system with Microstation using the MGE 6.0 compliment of software and the Oracle 7.1 relational data base. Current GIS project related software includes: Microstation 5.0, Oracle 7.1, IRAS B, IRAS C 5.04 and IRAS Engineer, DB Access, MGE Basic Nucleus, MGE Analysis, MGE Modeler, MGGA, ERMA Data Manager, ERMA Site Geologist, ERMA Groundwater Modeler, Inroads, Insitu, Base and Advanced Imager and Vistamap Version 1.1. All data for formal submittals shall be on either 8mm NT 10 Gigabyte tape, PC 3.5" floppies or PC CD-ROM. The PC CD-ROM are preferred, and the format is required for data submission sizes from 2-600 MB supplemented with 10 Gigabyte tape for larger data sets or floppy for small sets. Two copies of each submittal are required and are to be submitted in two different packages.

3.8.8 Items and data to be submitted to USAESCH are as follows:

3.8.8.1 Field Survey. The originals of all field books, layout sheets, computation sheets, abstracts, and computer printouts. All of these items shall be suitably bound and clearly

marked and identified.

3.8.8.2 Two copies each of all the tapes, floppies, or CD's required by this SOW.

3.8.8.3 A tabulated list of all control points and monuments showing their final adjusted coordinates and elevations (in meters and feet to the closest 0.001 meter and 0.01 foot) established and/or used for this survey. A tabulated list of each individual boundary corner and each grid corner shall also be provided showing the adjusted coordinates to the closest foot.

3.8.8.4 A "Report on Establishment of Survey Marker" (Description Card) on each permanent control monument established and/or used for the survey. In addition to the name or ID number of the monument, the cards shall show the adjusted coordinates and elevations (to the closest 0.01 foot and 0.001 meter), a written description for locating the monument from a well known and easily identified point, and a sketch showing how to locate the monument. These descriptions shall be submitted with one description being on a 5-inch by 8-inch (5" x 8") card, or two descriptions may be submitted on a 8 ½-inch by 11-inch ( 8 1/2" x 11") sheet of bond paper.

3.8.8.5 Drawings. The maps (Mylar) and CADD files of all areas mapped for this project. The original and one copy of each final map (standard metric A-1 size and 8 1/2" x 11" sheet of bond paper) shall be delivered to USAESCH.

3.8.8.6. Two copies of each tape or disk described in paragraph 3.8.6.

3.8.8.7. Schedule. All work and services under this paragraph shall be completed and submitted in accordance with paragraph 4.14 of this SOW.

3.8.8.8 All original and unique items created and/or used to create the end products specified with these descriptive narratives.

3.8.9 Aerial Photography. The Government will provide historical aerial photographs of Fort McClellan. These shall be scanned and geo-referenced for planning and mapping requirements.

These will also establish the base background for plotting EE/CA grids and other field investigation features.

3.9 (TASK 9) RECORD and SUBMIT VIDEO TAPE.

3.9.1 The A-E shall furnish the necessary personnel and equipment to videotape a sample of each activity from all field tasks of this SOW. Taping shall be of typical activities and accurately depict all work accomplished.

3.9.2 The videotape shall be standard VHS 1/2-inch color tape with voice background describing the actions being filmed, containing a minimum of 120 minutes footage.

3.9.3 Two copies of the videotape shall be submitted to CEHNC and two copies shall be submitted to the Mobile District.

3.10 (Task 10) - PREPARE EE/CA REPORT.

3.10.1 The A-E shall prepare and submit an EE/CA report fully documenting all fieldwork and subsequent evaluations and recommendations made by the A-E. The EE/CA report shall describe the site history, briefly describe previous work conducted at Fort McClellan, the work conducted under this task order, and the results. The report shall also contain the A-E's conclusions as to the nature and extent of OE contamination at Fort McClellan and provide recommendations for future work at Fort McClellan. The area within the limits of the proposed bypass should be sufficiently characterized in the EE/CA. The textual portions of the report shall be fully supported with accompanying maps, charts, and tables as necessary to fully describe and document all work performed and all conclusions and recommendations presented. After the site investigation is complete and the baseline site risk is assessed, the A-E shall identify and analyze removal alternatives. In addition, the A-E shall evaluate any institutional controls that can be a course of action.

3.10.2 Evaluate Institutional Controls. The EE/CA report shall fully evaluate physical removal and institutional controls as possible action alternatives. The A-E shall prepare an institutional controls analysis that addresses behavior modification and access control strategies to reduce or eliminate

OE risk. The objective of the analysis is also to document which Government agencies have jurisdiction over the OE-contaminated lands and to assess the Agency's capability and willingness to assert control which would protect the public at large from OE hazards. Additionally, this analysis should document the obligation of Government to protect citizens at large from safety hazards under tort law.

3.10.2.1 Institutional Data Gathering for the Analysis.. Basic data for the institutional analysis will be collected on forms provided to the A-E by the Government. These forms may be reproduced. A professional Urban Planner or equivalent will collect the survey data. Personal or telephone contact insures obtaining quality information. Do not mail the survey forms. All gathered data shall be safeguarded and protected from unofficial use.

3.10.2.2 Institutional Summaries. For each institution having jurisdiction in the contaminated area(s), the following information will be obtained and included in the analysis.

Name of Agency
Origin of Institution
Basis of Authority
Geographic Jurisdiction
Public Safety Function
Financial Capability
Constraints to Institutional Effectiveness (OE Safety)

3.10.2.3 Institutional Analysis Report. The basic report shall follow this outline and shall be appended to the EE/CA:

Purpose of Study
Methodology
Scope of Effort/Selection Criteria
Acceptance of Joint Responsibility
Technical Capability
Intergovernmental Relationships
Stability
Funding Sources

Recommendations

3.10.3 Developing Alternative Actions. The EE/CA will include a full range of alternative plans, which address project objectives. After all possible alternatives are identified, the A-E shall screen the alternatives to produce a focused set of action plans which address the concerns of the community, regulators, and the DOD. Infeasible plans will be discarded during the screening process. All plans that survive the screening process must be developed to the same level of detail. All shall be feasible and distinct. A minimum of five alternative plans shall be developed:

One alternative shall emphasize the basic strategy of access control.

One alternative shall emphasize the basic strategy of physical removal.

One alternative shall emphasize the basic strategy of behavior modification.

One alternative shall combine all strategies.

One alternative shall be the "No Action".

Several alternatives that address a single strategy may be developed if there are significant differences in plan performance with respect to selection criteria, and it is pertinent to the decision process. Only the vest of unique strategies will be combined.

3.10.3.1 Institutional Control Alternatives

3.10.3.1.1 Access control alternatives will be based on concepts such as:

Direct intervention like fencing and other barriers combined with trespass law enforcement.

Land use restrictions (zoning laws and enforcement).

Regulatory control (permit application, review, or approval of development plans).

Passive measures such as dedication of property to appropriate land uses.

3.10.3.1.2 Behavior modification alternatives will be based on concepts such as:

Notification of real estate defect.

Notices attached to building and/or construction permits.

Training clinics etc.

As a minimum, the A-E shall present alternatives that are completely formulated. All management, execution, and support roles will be identified. All costs incurred by participating institutions will be estimated.

3.10.4 Selected Alternatives. In close coordination with the CO, the A-E shall recommend a preferred alternative. This EE/CA report shall be prepared IAW the guidance contained in "Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA".

3.11 (TASK 11) PREPARE ACTION MEMORANDUM. The EE/CA will be provided to the public for their review and comments. The A-E shall evaluate any public comments provided by the Contracting Officer and shall incorporate them where directed by the Contracting Officer. Afterwards, the A-E shall prepare an Action Memorandum describing the selected alternative.

3.12 (TASK 12) MEETINGS. The A-E shall attend and participate in meetings with DoD, regulatory, and civilian agencies as directed by the CO.

3.13 (TASK 13) PROJECT MANAGEMENT. The A-E shall, during the life of the task order, manage the task order in accordance with the SOW. All project management associated with this task order, with the exception of direct technical oversight of work described in the preceding tasks, shall be accounted for in this task.

4.0 A-E QUALIFICATIONS and PROJECT MANAGEMENT.

4.1 The A-E shall furnish a staff that is qualified through training and experience to safely accomplish the objective and tasks of this SOW. All personnel shall be identified in the WP and their resumes included.

4.2 Training and all other requirements of 29 CFR 1910.120.

4.3 The A-E shall, during the life of the Task Order, manage the Task Order to accomplish the SOW. The Work Task Proposals shall include scope or level of effort required for the task, milestones, expected completion dates, and any other planning data

the A-E will use to accomplish each task.

5.0 SCHEDULE OF MEETINGS AND DELIVERABLES

5.1 Deliverables. The A-E shall provide the indicated deliverables on the following schedule:

| **Deliverables** | **Days after NTP** |
|---|---|
| Draft Work Plan | 60 days after award |
| Final Work Plan | 21 days after draft comments rec'd |
| Progress/Meeting Report | 10 days after event |
| Status Report | Monthly |
| Telephone/Conversation Report | Monthly |
| Draft EE/CA Report | 30 days after field work completed |
| Final EE/CA Report | 30 days after D-F comments rcvd |
| Public Meeting | 10 days after receipt Draft-Final comments |
| Action Memorandum-Draft | 30 days after D-F EECA comments rcvd |
| Action Memorandum-Final | 14 days after draft comments rcvd |

Status Reports and Telephone/Conversation Reports are due monthly.

The original of each of these reports shall be sent within 10 days of the end of the reporting period by normal mail to:

| |
|---|
| Commander<br>US Army Engineering and Support Center, Huntsville<br>ATTN: CEHNC-PM (Mr. David Skridulis)<br>P.O. Box 1600<br>4820 University Square<br>Huntsville, Alabama 35816-1822 |

5.2 Addresses and Distribution The A-E shall furnish copies of the plans and reports as indicated to each addressee listed below in the quantities indicated. The A-E shall use express mail services for delivering these plans and reports. Following each submission, comments generated as a result of their review shall be incorporated. All comments will be sent to the CEHNC Project Manager for consolidation prior to incorporation. All comments should be referenced to support those comments. The following addresses shall be used in mailing submittals:

| **ADDRESSEE** | **Draft Submittals** | **Draft-Final & Final Submittals** |
|---|---|---|
| Commander<br>US Army Engineering and Support Center, Huntsville<br>ATTN: CEHNC-PM (Mr. David Skridulis)<br>4820 University Square<br>Huntsville, Alabama 35816-1822 | 6 | 6 |
| Commander<br>US Army Engineer District, Mobile<br>ATTN: CESAM-EN-GH (Mr. Ellis Pope)<br>109 St. Joseph St.<br>Mobile, AL 36602-3630 | 2 | 2 |
| U.S. Environmental Protection Agency<br>Atlanta Federal Center<br>ATTN: Mr. Bart Reedy<br>100 Alabama St. SW<br>Atlanta, GA 30303 | 2 | 2 |

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|---|---|---|
| Alabama Department of Environmental Management<br>Government Facilities Section, Haz Waste Branch, Land Division<br>ATTN: Mr. Chris Johnson<br>P.O. Box 301463<br>Montgomery, AL 36130-1463 | 2 | 2 |
| U.S. Army Chemical and Military Police Centers & Fort McClellan<br>Directorate of Environment<br>Bldg. 141A, 13th Ave<br>ATTN: ATZN-EM<br>Fort McClellan, AL 36205 | 2 | 2 |

6.0 SUBMITTALS and CORRESPONDENCE

6.1 Format and Content of Engineering Report. All drawings shall be of engineering quality with sufficient details. The report shall consist of 8 1/2" X 11" sheets of paper. The report covers shall consist of durable binders and shall hold pages firmly while allowing easy removal, addition, or replacement of pages. A title shall identify the site, the A-E, the Huntsville Center, and date. The A-E's identification shall not dominate the title page.

6.2 Review Comments. The A-E shall review all comments received through the CEHNC Project Manager and evaluate their appropriateness based upon their merit. The A-E shall incorporate all applicable comments and provide a written response to each comment no later than 21 days after the A-E receives the comment.

6.3 Identification of Responsible Personnel. Each submittal shall identify the specific members and title of the subcontractor and A-E's staff, which had significant input into the report. All final submittals shall be sealed by a registered Professional Engineer-In-Charge.

6.4 Presentations. The A-E shall make presentations of work performed and as directed by the CO. The presentation shall consist of a summary of the work accomplished and will be followed by an open discussion.

6.5 Minutes of Meetings. Following the presentation and the

public meeting, the A-E shall prepare and submit minutes of the meeting within 10 working days to the CO.

6.6 Correspondence. The A-E shall keep a record of phone conversations and written correspondence affecting decisions relating to the performance of this task order. A summary of the phone conversations and copies of written correspondence shall be submitted to the CO with the monthly progress report.

6.7 Monthly Progress Report. The A-E shall prepare and submit monthly progress reports describing the work performed since the previous report, work currently underway, and work anticipated. The report shall state whether current work is on schedule. If the work is not on schedule, the A-E shall state what actions will be taken in order to get back on schedule. The report shall be submitted to the CO not later than the 10th day of each calendar month.

6.8 Computer Files. All final text files generated by the A-E under this task order shall be furnished to the CO in WordPerfect 6.0, IBM PC-compatible format. All drawings shall be on reproducible (Mylar) and digitized 3D-design file in Intergraph Corporation format, compatible with CEMNC Graphics system.

## 7.0 SAFETY REQUIREMENTS

7.0.1. The A-E shall develop and implement a Health and Safety Program in compliance with the requirements of OSHA standard 29 CFR 1910.120 (b)(1) through (b)(4) as required for this effort. Written certification that the health and safety program has been developed and implemented shall be submitted to the Contracting Officer. The written program shall be made available upon request.

7.0.2 The A-E shall prepare a SSHP and submit to the CO for review and approval prior to commencement of any fieldwork. The SSHP shall be prepared IAW guidance in this section and shall comply with all federal, state, and local health and safety requirements, e.g., the Occupational Safety and Health Administration (OSHA) requirements (29 CFR 1910 and 1926), the U.

S. Environmental Protection Agency (USEPA) hazardous waste requirements (40 CFR 260 - 270), the U. S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), the U.S. Army Corps of Engineers Safety and Occupational Health Document Requirements for HTRW and OEW Activities (ER 385-1-92), and applicable Army regulations. The A-E shall submit versions of this document IAW the schedule provided in this SOW. The A-E shall revise and re-submit this document as necessary to address all comments and deficiencies.

7.0.3 The SSHP shall address the elements described in this section. The level of detail provided shall be tailored to the type of work, complexity of operations to be accomplished, and the hazards anticipated. Where a specific element is not applicable, state that adequate consideration was given the topic and provide a brief justification for its omission.

7.1 General. The SSHP shall be reviewed, approved, and implemented by a board certified or board eligible Industrial Hygienist with at least 2 years hazardous waste site operations experience. Board certification or eligibility shall be documented by written confirmation by the American Board of Industrial Hygiene (ABIH) and submitted to the Contracting Officer for review. A fully trained and experienced site safety and health officer (SSHO) (a UXO supervisor at minimum) responsible to the A-E shall be delegated to implement the on-site elements of the SSHP. The SSHP shall be in a form usable by authorized U.S. Government representatives and other authorized visitors to the site during site operations.

7.2 Staff Organization, Qualifications and Responsibilities. The operational, health, and safety responsibilities of each key person shall be provided. The organizational structure, with lines of authority and overall responsibilities for safety and health of the A-E and all subcontractors shall be discussed. An organizational chart showing the lines of authority for safety shall be provided. Each person assigned specific safety and health responsibilities shall be identified and his/her

qualifications and experience documented by a resume in the SSHP.

7.3 Site Description and Contamination Characterization. Provide a description of the site based on results of previous studies, site history, and prior site uses and activities. Describe the location topography and approximate size of the site, the on-site job tasks to be performed, and the duration of planned activities. Compile a summary of hazardous substances and safety and health hazards likely to be encountered on site. Include ordnance and chemical/biological names, concentration ranges, media in which found, locations on-site, and estimated quantities/volumes to be impacted by site work. The site descriptions shall be based on results of previous studies and the history of prior site uses and activities conducted under Task 1 of this Scope of Work.

7.4 Hazard Assessment and Risk Analysis. In the SSHP, the A-E shall provide a complete description of the work to be performed at each site. The A-E shall identify the chemical, physical, safety, and biological hazards that may be encountered for each task and/or site operation to be performed. Each task/operation is to be discussed separately. Routes and sources of exposure for chemical hazards anticipated onsite along with chemical/biological names, concentration ranges, media in which found, locations on-site, estimated quantities/volumes, and the applicable regulatory standards (PELs) and recommended protective exposure levels (TLVs) shall be provided. Action levels shall be specified and justified for implementation of engineering controls/and or work practice controls, for emergency evacuation of on-site personnel, and for the prevention and/or minimization of public exposure to hazards created by on-site activities.

7.5 Accident Prevention. The SSHP may serve as the Accident Prevention Plan provided it addresses all content requirements of both 29 CFR 1910.120 and EM 385-1-1 (Appendix A). All Accident Prevention Plan elements required by EM 385-1-1, Appendix A, but not specifically covered by these elements shall be addressed in this section of the SSHP. Daily safety and health inspections

shall be conducted to determine if site operations are conducted IAW the approved plans and contract requirements.

7.6 Training. All general site workers shall receive 40 hours of initial off-site health and safety training (24 hours for non-exposed on-site personnel) which is relevant to hazardous waste site activities, plus three (3) days of supervised field experience (one (1) day for non-exposed personnel), in compliance with 29 CFR 1910.120 (e). In addition, site-specific, supervisory, refresher, visitor training, and training IAW the aforementioned regulation shall be addressed. The content, duration, and frequency of all training shall be described. The A-E shall provide written certification to the CO that the A-E's affected personnel prior to engaging in on-site activities have received the required training.

7.7 Personal Protective Equipment. A written Personal Protective Equipment (PPE) Program shall be provided in the SSHP. The program shall address all the elements of 29 CFR 1910.120 (g)(5), 29 CFR 1910.132, and 29 CFR 1910.134. Minimum levels of protection necessary for each task/operation to be performed at each site based on probable site conditions, potential occupational exposure (including heat and cold stress) and the hazard assessment/risk analysis required above. Include specific types and materials for protective clothing and respiratory protection. Establish and justify upgrade/downgrade criteria based upon the action levels as required. As a minimum and as appropriate, the following emergency and first aid equipment shall be immediately available for on-site use: (1) First aid equipment and supplies approved by the consulting physician; (2) Emergency eyewashes/showers which comply with ANSI Z-358.1; (3) Emergency use respirators (worst case appropriate); (4) Spill control materials and equipment; and (5) Fire extinguishes (specify type, size and locations).

7.7.1 A-E's PPE shall compromise that equipment necessary to adequately protect the personnel working on or visiting any site under the A-E's jurisdiction. The A-E shall describe in detail and

provide appropriate PPE to ensure workers and government employees are not exposed to levels greater than the action level for identified hazards for each operation stated for each work zone. The level of protection shall be specified for each operation and shall be in compliance with all requirements of 29 CFR 1910. The A-E shall provide, maintain and recommend PPE levels.

7.8 Medical Surveillance. All personnel performing on-site activities shall participate in an ongoing medical surveillance program meeting the requirements of 29 CFR 1910.120, and ANSI Z-88.2, as applicable. The medical examination protocols and results shall be overseen by a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine, or who by necessary training and experience is board eligible. Minimum specific exam content and frequency based on probable site conditions, potential occupational exposures and required protective equipment shall be specified. A written medical opinion from the examining physician as to fitness to perform the required work shall be made available to the CO upon request for any site employee.

7.9 Environmental and Personal Monitoring. Where it has been determined that there may be employee exposures to on- and/or off-site migration potentials of hazardous airborne concentrations of hazardous substances, appropriate direct reading (real-time) air monitoring' and integrated (time weighted average) air sampling shall be conducted in accordance with applicable federal, state, and local requirements. Both air monitoring and air sampling must accurately represent concentration of air contaminants encountered on and leaving the site. The types and frequency of monitoring/sampling to be performed shall be specified for on-site and perimeter, where applicable. Where perimeter monitoring is not deemed necessary, provide suitable justification for its exclusion. When applicable, NIOSH and/or EPA sampling and analytical methods shall be used. Personal samples, where necessary, shall be analyzed by laboratories successfully participating in and meeting the requirements of the American

Industrial Hygiene Association's (AIHA) Proficiency Analytical Testing (PAT)or laboratory Accreditation Program. Include, as appropriate, real-time (direct-read) monitoring and integrated Time Weighted Average sampling for specific contaminants of concern. Meteorological, noise, and radiation monitoring shall be conducted as needed depending upon the site hazard assessment. All monitoring and sampling protocol shall be specified to include instrumentation to be used and calibration of instruments. All monitoring results shall be compared to action levels to determine the need for corrective actions.

7.10 Heat/Cold Stress Monitoring. Heat and cold stress monitoring protocols, as appropriate, shall be described in detail. Work/rest schedules shall be determined based upon ambient temperature, humidity, wind speed (wind chill), solar radiation intensity, duration and intensity of work and protective equipment ensembles. Minimum required physiological monitoring protocols, which will affect work schedules, shall be developed. In cases where impervious clothing is worn, the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" protocol for prevention of heat stress shall be followed and heat stress monitoring shall commence at temperatures of 70 degrees Fahrenheit and above. Where impervious clothing is not worn, the ACGIH heat stress standard (TLV) shall be used. For cold stress monitoring to help prevent frostbite and hypothermia, the ACGIH cold stress standard shall be referenced and followed, as a minimum.

7.11 Site Control. The A-E shall describe site control measures which include site maps, the work zone delineation and access points, the on/off-site communication system, general site access controls, and security procedures (physical and procedural).

7.12 Personnel and Equipment Decontamination. The A-E shall develop and specify decontamination procedures IAW 29 CFR 1910.120 for personnel, personal protective equipment, monitoring instruments, sampling equipment, and heavy equipment.

Decontamination procedures shall address specific measures to ensure that contamination is confined to the work site. Necessary facilities and their locations, detailed standard operating procedures, frequencies, supplies, and materials to accomplish decontamination of site personnel and to determine adequacy of equipment decontamination shall be discussed.

7.13 Emergency Response and Contingency Procedures (On-site and Off-site). An Emergency Response Plan as required by 29 CFR 1910.120 shall be developed and implemented. As a minimum it shall address the following elements: (1) Pre-emergency planning and procedures for reporting incidents to appropriate Government agencies for potential chemical exposure, personal injuries, fire/explosions, environmental spills and releases, discovery of radioactive materials; (2) personnel roles, lines of authority, communications; (3) posted instructions and list of emergency contacts: physician, nearby notified medical facility, fire and police departments, ambulance service, state/local/federal environmental agencies, CIH, and CO; (4) emergency recognition and prevention; (5) site topography, layout and prevailing weather conditions; (6) criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distance, place of refuge, evacuation routes, site security and control; (7) specific procedures for decontamination and medical treatment of injured personnel; (8) route maps to nearest pre-notified medical facility; (9) criteria for initiating community alert program, contacts and responsibilities; and (10) critique of emergency responses and follow-up. Material Safety Data Sheets (MSDS) for each hazardous substances anticipated to be encountered on site shall be made accessible to site personnel at all times and shall be submitted in an appendix to the SSHP.

7.14 Standing Operating Procedures, Engineering Controls and Work Practices. The A-E shall develop standing operating procedures to protect field personnel, prevent accidents, minimize hazards, and to take action to correct hazards where necessary.

Site rules and prohibitions for safe work practices shall be discussed and shall include such topics as use of the buddy system, smoking restrictions, material handling procedures, confined space entry, excavation safety, physiological and meteorological monitoring for heat/cold stress, illumination, sanitation, and daily safety inspections, etc. This list of topics is not intended to be all-inclusive.

7.15 Logs, Reports and Record Keeping. Record keeping procedures for training logs, daily safety inspection logs, employee/visitor registers, medical surveillance records and certifications, air monitoring results and personal exposure records shall be specified. All personnel exposure and medical monitoring records shall be maintained IAW applicable OSHA standards, CFR 1904, 1910, and 1926. The A-E shall develop, retain, and submit training logs, daily safety inspection logs as part of the daily QC Reports, employee/visitor registration and medical opinions/certifications as part of the final contract file. All recordable accidents/injuries/illnesses shall be reported to the CO immediately. A completed ENG 3394, Accident Investigation Report, shall be submitted within two working days IAW AR 385-40 and USACE Supplement 1 to that regulation.

9.0 **Public Affairs.** The A-E shall not publicly disclose any data generated or reviewed under this contract. The A-E shall refer all requests for information concerning the site condition to the CEHNC Project Manager. Reports and data generated under this task order are the property of the Department of Defense and distribution to any other sources by the A-E, unless authorized by the CO, is prohibited.

10.0 **REFERENCES.**

10.1 "U.S. Army Corps of Engineers Safety and Health Requirements Manual", U.S. Army Engineer Manual EM 385-1-1, September 1996.

10.2 "Safety Concepts for Unexploded Ordnance", ETL 385-1-1, Huntsville Division, U.S. Army Corps of Engineers, 16 December 1992

10.3 "Accident Reporting and Records" with USACE Supplement, AR 385-40, 1 November 1994 w/chgs

10.4 "Ammunition and Explosive Standards", TM 9-1300-206, 30 August 1973 w/chgs

10.5 "Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities", Engineer Regulations 385-1-92, 18 March 1994.

10.6 "Archives Search Report", U.S. Army Corps of Engineers, St. Louis District, April 1997.

10.7 "Occupational Safety and Health Administration Standards", (29 CFR 1910 and 1926).

10.8 "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", NIOSH/OSHA/USCG/EPA, October 1985.

10.9 "Emergency Eyewash and Shower Equipment", ANZI Z-358.1, 1990.

10.10 "Annual Book of ASTM Standards", Current edition.

10.11 "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" EPA/540/G-89/004, October 1988.

10.12 "CERCLA Compliance With Other Laws Manual", Parts I and II, USEPA, 1988b.

10.13 "Methods for Evaluation the Attainment of Cleanup Standards", Volume I - Soils and Solid Media, USEPA, 1989e.

10.14 "Cost Engineering Policy", U.S. Army Engineering Regulation No. 1110-3-1301, April.

10.15 Code of Federal Regulations, 40 CFR, Parts 190-299. latest edition.

10.16 Code of Federal Regulations, [n.d.] "Hazardous Waste Operations and Emergency Response." CFR 1910.120, Final Rule.

10.17 "Compendium of Superfund Field Operations Methods", USEPA, 1987.

10.18 "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA", USEPA 540/g89/004, October 1988.

10.19 "Ammunition and Explosives Safety Standards", DOD 6055.9-STD, 30 October 1992

10.20 "Risk Assessment Guidance for Superfund (RAGS)", Vols I and II, US Environmental Protection Agency (EPA. 1989b

10.21 "General Information on EOD Disposal Procedures", TM 60A-1-1-31, 19 January 1982 w/chgs

10.22 "Site Summary and Project Summary Sheets foe DERP-FUDS Site No. I04AL005700", CESAM-PD-E, 28 April 1992

10.23 " Ordnance and Explosives Cost Estimating Risk Tool (OE Cert) Standing Operating Procedure (SOP)". DRAFT. CEHNC 1115-3-86, August 1996.

** Additional References may be incorporated and will be finalized at the completion of negotiations.

Assumptions of level of effort for Basis of Estimate

Task 1 - Assume 4 people for site visit for 2 days including travel

Task 2 - Assume 3 people for 5 days including travel

Task 4 - Assume 5 days @ 2 acres a day

Task 5 - Assume 5 days @ 2 acres a day

Task 6 - Assume 2 weeks to sample 10% of anomalies on 10 acres including demolition of OE and Disposal of scrap

Task 7 - Assume 2 people for 2 meetings @ 2 days including travel

Task 8 - Assume 4 days including mob and demob to establish grid locations

Task 12 - Assume 3 people for 3 meetings @ 2 days including travel

# APPENDIX D

# RESUMES

**SUZANNE CANTOR-MCKINNEY**
PROJECT MANAGER

## SUMMARY OF CAPABILITIES

- Regulatory Review and Compliance Evaluation
- Technical Report Preparation
- Data Collection and Analysis
- Environmental Site Assessment
- Soil and Groundwater Assessment
- Wetlands Identification and Permitting

## EDUCATION

MS, Land and Water Resource Management, University of North Texas, 1983
BS, Biology, Marshall University, 1982
OSHA 40-Hour Health and Safety Training Instruction
OSHA 8-Hour Supervisor Course 29 CFR 1910.120 (e) (4)

## PROFESSIONAL EXPERIENCE

As an Environmental Scientist, Ms. Cantor-McKinney is experienced in all phases of environmental site assessment, investigation, and remediation. She provides technical and field support for soil and groundwater investigation at RCRA/CERCLA sites, Formerly Used Defense Sites (FUDS), landfill sites, and petroleum and hazardous waste contamination sites. She has designed and implemented soil and groundwater investigations and remediation. She has also conducted sample collection and data analysis at hazardous waste sites and reviewed lab results from these analyses. She conducts regulatory compliance reviews, develops work plans for investigation and remediation sites, and provides technical oversight and review.

Ms. Cantor-McKinney served as Project Manager in the research and development of the Engineering Evaluation / Cost Analysis (EE/CA) for the former H. Smart Field in Macon, Georgia. For this project, she research the impacts of chemical warfare materiel on human health and the environment, and presented the risks and risk reduction alternatives in the EE/CA.

Ms. Cantor-McKinney has also developed and implemented community relations plans for the US Army Corps of Engineers. She has coordinated the activities of a Restoration Advisory Board, comprised of diverse public members, to oversee the cleanup of a former defense site contaminated with unexploded ordnance waste. She coordinates the Board's operation, facilitates technical panels and conferences, conducts public meetings, and acts as liaison between the Board and the Corps of Engineers, the EPA, and state regulatory agencies.

Ms. Cantor-McKinney served as Project Manager with the US Environmental Protection Agency, where she coordinated assessment and remediation projects with the Corps of Engineers and developed and implemented site management and monitoring plans. She has extensive experience with federal, state, and local agencies and nonprofit organizations. Ms. Cantor-McKinney has also identified contamination sources, reviewed endangered species data and habitats issues, and managed multiple concerns while conducting site characterizations, including: illegal dumping, landfills, on-site use of herbicides, insecticides, and fertilizers, and hazardous materials storage and disposal.

## SUMMARY OF CAPABILITIES

- Industrial Hygiene
- Lead-Based Paint and Asbestos Testing and Abatement Design
- Indoor Air Quality
- Occupational Safety and Health
- Hazardous Waste Management
- Environmental Program Management

## EDUCATION, TRAINING, AND PROFESSIONAL AFFILIATION

BS. Biology-Chemistry, Central Michigan University, 1964
MS. Biology, Central Michigan University, 1966
MSPH. Environmental Sciences. University of North Carolina, 1970
40 Hour OSHA Health and Safety Training (29 CFR 1910.120)
8-Hour Supervisor Course (29 CFR1910.120(e)(4))
Advanced Industrial Hygiene Course
Asbestos Control Procedures
Certification Comprehensive Practice of Industrial Hygiene
Diplomate. American Academy of Industrial Hygiene
Member of the American Hygiene Association and the American Chemical Society
Advanced Industrial Hygiene Course. U.S. Army Environmental Hygiene Agency. Aberdeen Proving Ground. MD
Army Command and General Staff College. Fort Leavenworth. KS
Chemical Senior Staff Officer Course. Fort McClellan, AL
Chemical Surety Basic Course. Tooele Army Depot, UT
Environmental Laws and Regulations. Government Institutes, Inc.
Health Physics Aspects of Radioisotope Use, Walter Reed Army Medical Center, Washington D.C.
Military Medical Ecology, Walter Reed Army Med. Center, Washington DC
Treatment of Chemical Casualties Course, U.S. Army Medical Institute of Chemical Defense, Aberdeen Proving Ground, MD

## PROFESSIONAL EXPERIENCE

As a Certified Industrial Hygienist, Mr. Soyak has been responsible for the management of environmental and remediation projects, toxic materials handling, and industrial hygiene services for public and private clients for more than 30 years. He is an experienced manager responsible for providing oversight and quality assurance for a variety of environmental programs such as Asbestos and Lead projects for government and private clients; and completing and submitting appropriate government-required documentation and permit applications. Mr. Soyak provides interaction between clients and regulatory agencies. As a former military member, he has thorough knowledge of DOD regulations. policies. and procedures.

Mr. Soyak has evaluated indoor firing ranges to determine airborne lead exposures and existing work practices and control measures; developed and coordinated lead medical surveillance programs for personnel involved with lead paint abatement; developed lead training manuals for workplaces; and performed oversight and quality assurance during lead abatement activities.

Mr. Soyak has also directed and performed numerous asbestos surveys and quality assurance evaluations during asbestos projects. While conducting these surveys, Mr. Soyak determined locations, quantities, and physical condition of asbestos.

Mr. Soyak served as Environmental Group Leader at the US Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, MD. He conceived, coordinated, and managed the development of environmental and occupational health elements for the Department of Army Chemical Stockpile Disposal Program and the Army's Installation Restoration Program. Contract officer's representative for development of a national environmental impact statement and represented the Army at Federal, state and public meetings. Mr. Soyak completed his military career as an officer in the U.S. Army Medical Service Corps, retiring in 1986 as a Lieutenant Colonel and was awarded the Bronze Star, three Meritorious Service Medals, and two Army Commendation Medals.

As the Senior Associate for Industrial Hygiene, Mr. Soyak was responsible for the management of occupational safety and health programs and plans for environmental remediation projects, hazardous material handling and industrial hygiene services to private clients, federal and state governmental agencies. Developed the Occupational Safety and Health Program for the Decommissioning of the ARCO Bluewater Uranium Mill, Grants, New Mexico. Developed a Maryland Air Toxics permit application for a metal recycling firm, conducted numerous asbestos abatement monitoring projects as the designated OSHA competent person, and provided Contractor Quality Control services for the U.S. Naval Air Station, Norfolk, Virginia, for the remediation of polychlorinated biphenyls, dioxians, furans, beryllium, radium and asbestos.

Mr. Soyak was the Site Health and Safety Supervisor for the Lansdowne Radioactive Residence Complex Dismantlement/Removal Project, Lansdowne, Pennsylvania. Responsible for management and supervision of subcontractor personnel for emergency medical support, security, health and safety aspects for the dismantlement/removal of residential properties and soils contaminated with radioactive material under the auspices of the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers. Provided health and safety training for project personnel and developed Phase Hazard Analyses for each stage of the project having potential health or safety hazards. Coordinated public affairs with project management and U.S. Environmental Protection Agency personnel.

Mr. Soyak was a senior industrial hygienist at the Technical Support Branch, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD. He was responsible for the management of Health Hazards Information System, Material Safety Data Sheets, Department of Army Hazard Communication Program, asbestos program management, specialized field studies, and consultation to Army industrial hygiene personnel worldwide. Provided government, onsite project management, for asbestos abatement at the United States Embassy, Moscow, USSR conducted by Bechtel International, Inc.

Mr. Soyak served as Environmental Group Leader at the US Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, MD. He conceived, coordinated, and managed the development of environmental and occupational health elements for the Department of Army Chemical Stockpile Disposal Program and the Army's Installation Restoration Program. Contract officer's representative for development of a national environmental impact statement and represented the Army at Federal, state and public meetings. Mr. Soyak completed his military career as an officer in the U.S. Army Medical Service Corps, retiring in 1986 as a Lieutenant Colonel and was awarded the Bronze Star, three Meritorious Service Medals, and two Army Commendation Medals.

Mr. Soyak served as Senior Industrial Hygienist at the US Army Chemical Research, Development, and Engineering Center, Aberdeen Proving Ground, MD. He provided technical consultation to project engineers and program managers in occupational and environmental health matters, instituted health hazard assessments for developmental items, prepared human volunteer protocols, conducted design reviews for construction projects and hazardous waste remediation projects, served on numerous Department of Defense and Army task forces to develop chemical safety policy and procedures.

**NEIL J. GILBERT, P.E., P.G.**
SENIOR ENGINEER

## SUMMARY OF CAPABILITIES

- Blast Monitoring and Crack Surveying
- Environmental Studies and Assessments
- Geological Investigations
- Geotechnical Explorations
- Machine Vibration Studies
- Remote Sensing Studies
- Waste Facility Siting and Permitting

## EDUCATION

M.S., Engineering Science (Civil Engineering), University of California, Berkeley, 1973
M.A., Geology, University of California, Berkeley, 1969
A.B., Geology, University of California, Berkeley, 1967
A.A., Geology, College of San Mateo (California), 1964

## PROFESSIONAL ASSOCIATIONS

American Institute of Professional Geologists (Vice Pres., Carolinas Section, 1983)
American Society of Civil Engineers (President, 1984-85)
Association of Engineering Geologists
Geological Society of America (Fellow)
Berkeley Geotechnical Society
Carolina Geological Society (Vice President, 1976-77; Director, 1985-86)

## PROFESSIONAL REGISTRATION

Registered Professional Geologist in NC, SC, TN and GA
Registered Professional Engineer in NC and SC

## PROFESSIONAL EXPERIENCE

Mr. Gilbert has 25 years of technical experience in the specialized field of engineering geology, for the last 15 years applying that background to environmental considerations and waste-management concerns. He has conducted and supervised numerous geologic investigations and geotechnical engineering projects throughout the southeastern United States, including studies related to siting and evaluation of waste-disposal facilities and licensing of nuclear facilities.

He was elected to Fellow of the Geological Society of America and has been a long-term member and officer in many other professional engineering and geological societies. For eight years, Mr. Gilbert served on the North Carolina Board for Licensing of Geologists and was Chairman for three and one-half years. As chairman, he represented the North Carolina Geologist Licensing Board at national meetings of geologist-licensing and engineer-registration organizations (i.e., ASBOG and NCEES).

Mr. Gilbert served in consulting roles in support of North Carolina's application for the Superconducting Super Collider and for statewide screening for the Low-Level Radioactive Waste Disposal Facilities in North Carolina and Pennsylvania.

Since 1973, he has served variously as Site Geologist, Project Geologist and Project Manager for nuclear facilities. He has conducted numerous studies and investigative projects the Valley and Ridge, Piedmont, and Coastal Plain Provinces. His experience includes logging of rock core, petrographic studies, analysis of remote sensing imagery, use of geophysical exploration techniques, reconnaissance and detailed geologic mapping and preparation of reports. Mr. Gilbert has been responsible for geological, geotechnical and hydrogeological explorations of a variety of power, industrial and waste-related facilities.

Mr. Gilbert has extensive experience using remote sensing techniques. He has utilized both color and black-and-white aerial photographs for petroleum exploration in the Rocky Mountains area and for geologic mapping in the Coast Range of California. Geologic studies for the various nuclear facilities that he has worked on included interpretation of black-and-white, color and false-color-infrared aerial photographs, magnetic surveys and gravimetric surveys.He has managed and directed various other aspects of waste management and environmental studies including assessment of contaminant plumes from leaking underground storage tanks and real-estate (environmental) audits. His experience includes delineation, implementation and monitoring of remedial action plans.

He has conducted and managed numerous geological investigations for geotechnical engineering projects in the southeastern United States. Geologic settings have been in the Coastal Plain, Piedmont, Blue Ridge, Valley and Ridge and Appalachian Plateaus. These investigations have involved the use of published and unpublished data, remote sensing, surface and subsurface geophysics, geologic mapping (both reconnaissance and detailed), rock core logging and petrographic work. The scope of these projects has ranged from evaluating the general geologic setting, to collecting structural data for evaluation of slope or dike stability, to comprehensive studies resulting in development of a detailed, site-specific geologic history.

**JAMES G. WALDEN**
SENIOR UXO SUPERVISOR

Date Completed Basic EOD School: June 1971

Other Pertinent Training: HAZWOPER

**EOD/UXO Assignments:**

| | |
|---|---|
| Jun 71 - Aug 73 | EOD Technician, TAD Assignment, Ft. Huachuca, AZ. EOD team member providing range support to the military intelligence school. Involved in one major range clearance. |
| Nov 73 - Mar 77 | EOD Technician, 40th EOD, Camp Shelby, MS. EOD team member providing support to large National Guard training area. Performed range clearance operations after each camp. |
| Apr 77 - Mar 78 | EOD Technician, 8th EOD, Republic of Korea. EOD team member on major demolition operation, destroying over forty tons of ordnance. |
| Apr 78 - May 84 | EOD Team Leader, 13th EOD, Ft. Gillem, GA. Provided EOD support to northern half of the state of Georgia, including training at Ft Gordon, GA. Provided support to National Guard training in Puerto Rico. |
| Jun 84- Jun 87 | EOD Supervisor, 547th EODCT, Ft. Gillem, GA. Provided training and operational support to EOD units throughout the Southeastern US and the Panama Canal Zone. |
| Jul 87 - Dec 89 | EOD Operations NCO, FORSCOM HQ, Ft. McPherson, GA. Provided operational and training guidance to 54 EOD units within Forces Command. Member of the Intermediate Nuclear Force Treaty verification team. |
| Jan 90 - Jun 92 | Detachment NCO, 50th EOD, Granite City, IL. Responsible for EOD support in the southern half of Illinois, Indiana and the city of St. Louis, MO. Area expanded to the entire area of both states during Desert Storm. Supported range clearance operations at Ft.McCoy, WI. |
| Feb 93 - Jan 96 | Sergeant Major, EOD Training Department, Redstone Arsenal, AL. Supervised six branch NCOICs responsible for eighty personnel and 300 students annually. Reviewed and revised programs of instruction and lesson plans. Member of the commandant's environmental compliance council. |
| Jul 96 - Jul 96 | UXO Technician, CMS Environmental, Inc. Performed duties as UXO Specialist at Camp Bullis, TX for surface and subsurface OE investigation of a small arms range. |
| May 98 - May 98 | UXO Technician, CMS Environmental, Inc. Senior UXO Supervisor and site project manager for subsurface clearance of a demolition and training area at the FAA Technical Facility, Atlantic City International Airport, NJ. |
| Mar 96 - Present | UXO Technician, UXO Staff Officer, CMS Environmental, Inc. Perform site visits; Review and assist in work plan revision for OE contracts. Provide input on draft work plans for additionalremediation contract proposals. |

**DAVID A. LIEBLICH, Ph.D.**
GEOPHYSICIST

## Education

| | |
|---|---|
| Ph.D. | Geophysics, University of Connecticut, 1996 |
| M.S. | Geophysics, University of Houston, 1990 |
| B.S. | Geology, SUNY Albany, 1981 |

## Professional Experience

1996-present SC&A, Inc.
Chief Geophysicist, GeoScience Division. Responsibilities include developing and supervising remote sensor digital signal processing, data fusion, and GIS techniques and application of these techniques to unexploded ordnance (UXO), land mine detection, environmental, and engineering projects. Provided geophysicist support to the engineering sampling analysis conducted at the Umatilla Depot Ammunition Demolition Activity. Developed data analysis techniques for enhancing the US Army Corps of Engineers Ordnance and Explosives Knowledge Base. Provides geophysicist support to federal government nuclear waste repository development programs. Is an expert in the area of UXO risk assessment using standardized Government-provided assessment tools, as well as developing new, UXO-specific risk models.

1988-1996 USGS-WRD
Physical Scientist, Geophysical Applications and Support Branch. Designed, implemented, and supervised surface and borehole geophysical surveys, data reduction, analysis, and interpretation. Taught geophysical methods to hydrologists, conducted original research into new and potentially useful methods for hydrologic applications, developed technical approaches and methods for interagency technology application projects, and collaborated with researchers in other government, non-governmental, and foreign agencies.

1987 GEOLOGIC SYSTEMS INC.
Consultant. Conducted research into and reported on numerical modeling of geologic deformation associated with faulting and folding.

1984-1986 TEXACO RESEARCH LABORATORY, Houston, Texas.
Programmer. Developed a program to link the Getty and Texaco geophysical data bases and designed and developed a program to accomplish 3D layer backstripping, with decompaction, in sedimentary basins.

Professional Experience (Continued)

1982-1984 THE ANSCHUTZ CORPORATION, Exploration Research, Denver, Co.
Geological Technician. Prepared balanced interpretive cross sections across the Western Overthrust Belt, used elastic flexed beams to model crustal flexure of the western overthrust region in 3D, performed stratigraphic correlations in the Bolivian Andes, researched and reported on the structure of the Anshutz Ranch East oil field, developed a computer program for maturation modeling, and applied the program to four prospective basins.

1981-1982 ANALEX (X-log), Aurora, Co.
Well-site Geologist. Monitored drilling, and performed rock- sample and gas chromatograph analyses. Direct involvement in 2 wildcat discoveries.

Summary of Professional Accomplishments

On-site geophysicist for the Ammunition Demolition Activity Engineering Sampling Analysis conducted by the Corps of Engineers at the Umatilla Depot. Supported the preparation of Work Plans, established methodologies and procedures for development of the Umatilla GIS, and determined best approaches for using the OE-Knowledge Base geophysical analysis technology at the Depot.

Developed UXO risk assessment models based on integration of; a) existing Government risk assessment models, b) geophysical data collected as part of subsurface investigations, and c) historical information from UXO sites. This hybrid risk model is fully integrated within a geographical information system (GIS) and allows for rapid visualization of results. Is proficient in the execution of US Army statistical models SiteStats and GridStats, is an expert in the operational aspects of the OECert assessment package, and has extensive knowledge in the DoD's evolving UXO clearance regulations referred to as the Range Rule.

Conducted theoretical research, designed and implemented novel field experiments, processing and interpretation programs, and wrote a report on the utility of angular reflectivity for detection of contaminants using Ground Penetrating Radar (GPR).

Member of the USGS National Interdisciplinary Research Group studying fluid flow and chemical transport in fractured rocks. Conducted geophysical investigations at the USGS Fractured Rock Research Site, Mirror Lake, NH including multi-component surface seismic, land, marine, and borehole GPR, surface and borehole low-frequency-EM, and surface and borehole DC-resistivity. Demonstrated the utility of surface and borehole methods for predicting and extending subsurface information.

Conducted theoretical research and novel field experiments, and designed processing and interpretation programs on the utility of seismic data acquired in multi-azimuthal, multi- and single-component modes, for delineating shallow subsurface fractures.

Collaborated with research scientists at Schlumberger-Doll Research Center to a) investigate the capabilities of the Schlumberger directional borehole radar system for subsurface fracture delineation and environmental work, and; b) compare results to those obtained with the ABEM directional borehole radar system.

Collaborated with RimTech on low-frequency-EM borehole tomography experiments to investigate capabilities of low-frequency borehole-EM-tomography to produce images of near surface rocks, fractures, and fluids over large inter-well distances.

Collaborated with BRGM French scientists on a 3D borehole-DC-resistivity-tomography experiment to investigate the capabilities of 3D borehole-DC-resistivity-tomography to produce images of near surface rocks, fractures, and fluids.

Acquired, processed, and interpreted all land and marine GPR data from the USGS Fractured Rock Research Site, Mirror Lake, NH. Prepared reports on GPR based extension of a fault into the subsurface, bedrock depth prediction, lithology identification, and fracture delineation.

Evaluated the utility of the ABEM directional borehole radar and investigated changes in angular reflectivity of a thin layer containing varying concentration salt solutions to incident TE and TM radar wavefields. The purpose was to evaluate the potential of the directional borehole radar to directly detect permeable fractures in 3D from a single borehole.

Designed novel acquisition method, processed and interpreted GPR, DC-resistivity, low-frequency-EM, and seismic methods at two Superfund sites

Aided in the acquisition and evaluated the first processing results from the first 3D seismic survey designed specifically for engineering and environmental investigations.

Designed, supervised, and interpreted a pseudo-3D GPR survey to detect gasoline spills at the UCONN motorpool, and acquired a full CMP, pseudo-3D, GPR survey on Cape Cod.

Developed a new theoretical formulation for internal friction in dry cracked and fractured rocks, based upon a distribution of adhesive, elastic, ball-point, asperities. Applied the theory to data from real and simulated rock fractures.

Professional Affiliations

American Geophysical Union
Society Exploration Geophysicists
Engineering and Environmental Geophysical Society, member of research committee

Selected Publications

Lieblich, D.A., D. Reidy, and J.E. Foley, Use Of Groundtruth Information to Improve the Effectiveness of Geophysical Analysis at Umatilla Army Depot, proceedings from the UXO Forum, Anaheim, CA, May 5-7, 1998.

Foley, J.E., and D.A. Lieblich, Advanced Analysis Applied to Conventional Geophysical Data at JPG4, proceedings from the UXO Forum, Anaheim, CA, May 5-7, 1998.

Foley, J.E., Gifford, M., and Lieblich, D.A., Improved Detection and Discrimination of Subsurface UXO Using the OE-Knowledge Base, proceedings UXO from the Forum, Opryland, TN, May 28-30, 1997.

Lieblich, D.A., 1996, Internal Friction in dry cracked and fractured rocks, Ph.D. Thesis, University of Connecticut, Storrs, 205 pp.

Gaylor, R., Lieblich, D. A., Mariani, D., and Xia, J., 1994, Environmental logging with a borehole radar tool: Invited paper, in Conference Proceedings of the Second International Conference on Ultra-Wideband Short-pulse Electromagnetics, Polytechnic University.

Lieblich, D.A., Legchenko, A., Haeni, F.P., and Portselan, A., 1994, Surface nuclear magnetic resonance experiments to detect subsurface water at Haddam Meadows, Connecticut: in Symposium on the application of geophysics to engineering and environmental problems (SAGEEP), Boston, March 27-31, v. 2, p. 717-726.

Haeni, F.P., Lane, J.W., Jr., Lieblich, D.A., and Barton, C. C., 1993, Using surface geophysical and bedrock outcrop data to identify fractures near Mirror Lake, New Hampshire, in Proceedings of the Toxic Substances Hydrology Program Meeting, Colorado Springs, September 20-24th.

Haeni, F.P., Lane, J.W., Jr., and Lieblich, D.A., 1993, Use of surface-geophysical and borehole-radar methods to detect fractures in crystalline rocks, Mirror Lake Area, Grafton County, New Hampshire, in Hydrogeology of Hard Rocks, International Association of Hydrologists XXIVth Congress, Oslo, Norway, June 1993, Proceedings: Norway, International Association of Hydrologists.

Lieblich, D.A., Haeni, F.P., and Lane, J.W., Jr., 1992, Integrated use of surface-geophysical methods to indicate subsurface fractures at Milford, New Hampshire, and Tibbetts Road, Barrington, New Hampshire: U.S. Geological Survey Water-Resources Investigations Report.

Lieblich, D.A., Lane, J.W., Jr., and Haeni, F.P., 1991, Results of integrated surface-geophysical studies for shallow subsurface fracture detection at three New Hampshire sites, in Expanded Abstracts with Biographies, SEG 61st Annual International Meeting, Houston, Texas, November 10-14, 1991: Houston, Texas, Society of Exploration Geophysicists, p. 553-556.

Lieblich, D.A., 1990, An experimental and theoretical investigation of diffraction from a line source and its applications to seismic data processing, M.S. Thesis, University of Houston.

Gardner. G.H.F.. Lieblich. D., and Wang. S.Y., 1987, An experimental study of DMO in three dimensions: paper presented at: The European Association of Exploration Geophysicists Meeting. Belgrade. Yugoslavia.

# APPENDIX E

## USA ENVIRONMENTAL DEMOLITION STANDARD

# STANDARD OPERATING PROCEDURE

# DISPOSAL/DEMOLITION OPERATIONS

USA Environmental, Inc.
4904 Eisenhower Blvd.
Suite 310
Tampa, Florida 33634

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# 1. STANDARD OPERATING PROCEDURE: DISPOSAL/DEMOLITION OPERATIONS

## 1.1 General

This Standard Operating Procedure (SOP) is not intended as a stand-alone document and is to be used together with the Work Plan (WP), Site Safety and Health Plan (SSHP), applicable federal, state, and local regulations and, contract restrictions and guidance. The following USA Environmental's policies are not all inclusive nor are they applicable in all situations.

# 2. DISPOSAL/DEMOLITION OPERATIONS

The demolition procedures presented in this SOP are not all inclusive. Additional safety and procedures information are contained in the references cited in Section 4.

### *2.1.1 General Disposal Operations*

The following is a general guide for disposal operations:

- Analyze explosive operations with a view towards reducing the number of personnel and quantity of explosive material subject to an accident; however, never allow one person to work alone.
- Prohibit tasks not necessary to the explosive operation in the fragmentation zone of such operations.
- Use sufficient warning signals and maintain a restricted/exclusion area when explosive operations are conducted, cease operations when non-unexploded ordnance (UXO) personnel are present.
- Comply with the authorized explosive limits and safe separation distances.
- Discontinue explosive operations when unforeseen hazard conditions develop, and do not resume until the condition is corrected.
- Smoke only in designated areas.
- Plan for, provide for, and know the emergency procedures in the event of an accident.
- Use special care in handling and disposal of damaged or deteriorated explosives, munitions items, and other hazardous materials.
- Disperse explosives awaiting destruction, in small quantities at safe distances, and protect them from unintentional initiation.
- Protect explosives and munitions items from the elements and static electricity.

- Provide an emergency vehicle outside the fragmentation zone for response in the event of an accident.
- Perform disposal operations during daylight hours.
- Carry blasting caps in an approved container and handle them carefully.
- Do not use ordnance and explosive waste (OE) for donor charges in demolition operations as they may be in an extremely sensitive and hazardous condition.
- Use caution when investigating post demolition shots, searching the area after each shot for any remaining explosives or explosive components.

### *2.1.2 Demolition Procedures*

USA Environmental personnel will perform demolition operations in a manner consistent with industry standards and safety practices. The following procedures and safety precautions will be adhered to at all times.

### *2.1.3 OE Basic and General Safety Precautions*

These basic safety precautions are the minimum OE safety requirements required of all personnel on-site. Additional precautions and requirements are in the applicable manuals, referenced in Section 4. The following basic considerations should be taken into consideration when planning or conducting OE operations:

- **SAFETY IS PARAMOUNT.**
- The preferred method of disposal is Blow (detonate) in Place (BIP). However, items that are safe to move may be consolidated to reduce the number of shots.
- Unidentified items will not be moved or disturbed
- All OE will be independently identified by two (2) OE technicians.
- Souvenirs will not be collected.
- Smoking will be prohibited, except in designated areas.
- Fire or spark producing devices will not be carried onto the site.
- The "Buddy" system will be employed on all OE operations.
- Unnecessary personnel will be prohibited from visiting the site.
- Demolition operations will be in accordance with TM 60A-1-1-31.

### *2.1.4 Basic Safety Precautions*

The following safety precautions are applicable to all OE activities:

- Suspend all operations immediately upon approach of an electrical storm.
- Observe the hazards of electromagnetic radiation (EMR) precautions and grounding procedures when working with, or on, electrically initiated or susceptible OE.
- Do not dismantle, strip, or unnecessarily handle any OE.
- Avoid inhalation and skin contact with smoke, fumes, dust, and vapors of detonations and OE residue.
- Do not attempt to extinguish burning explosives or any fire which might involve explosive materials.
- Do not manipulate external features of ordnance items.
- Incorporate appropriate property and personnel protective measures for shock and fragmentation when conducting OE operations.
- Do not subject OE to rough handling or transportation. Sand bag, chock, and block appropriately.
- Carry explosives in an appropriate container.
- Hand carry no more than two items (one in each hand) at a time, and then only as required by the operation being performed.
- Destroy shaped charge munitions by counter charging the cone to prevent formation of the explosive jet.
- The preferred method for disposing of white phosphorous (WP) is to blow the munition in a manner that disperses the WP into the air, versus down into the ground.
- Do not transport damaged WP munitions unless fully submerged in water.
- Avoid unnecessary movement of armed or damaged OE.
- Avoid the forward portions of munitions employing proximity fuzing.
- Assume unknown fuzes contain cocked strikers or anti-disturbance features.

### *2.1.5 General Safety Precautions*

The following sub-paragraphs describe safety precautions for various types of munitions/disposal operations.

**Bombs**

- Ensure fuze wells do not contain fuze components; and
- Exercise caution when packing fuze wells of bombs or projectiles with explosives, as components of the fuze may remain.

**Clusters, Dispensers, Launchers**

- Approach and work from the sides of a dispenser.
- Consider an intact dispenser as fully or partially loaded.
- Consider any payloads outside the container or dislodged inside as armed.
- Take precautions for the most hazardous payloads until positively identified.

**Projectiles**

- Determine if the projectile has been fired and if so consider it armed.
- Check for the presence of unburned tracers.
- Avoid the rear and front of rocket-assisted projectiles.
- Handle projectile components such as powder increments, cartridges, and primers with caution.
- Seal the open ends of projectiles or sheared projectile components with tape or other suitable material before transporting.

**Grenades**

- Do not attempt to re-install safety pins on a dud fired grenade.
- Do not attempt to withdraw impinged firing pins from the fuze of a dud fired grenade.
- Do not dispose of grenades by functioning them as designed.

**Rockets**

- Approach and work on rockets from the side.
- Do not dismantle or strip dud fired rockets or rocket motors.
- Do not expose electrically fired munitions to radio transmissions within 25 feet.
- Do not transport an unfired rocket motor until having shielded the motor igniter from EMR.
- Dispose of unfired rocket motors, with or without warheads, in such a manner as to prevent them from becoming propulsive.

**Guided missiles**

- When found, restrict vehicular movement in the area of a guided missile.
- Avoid entanglement with guidance wires of wire-guided missiles.
- Restrict radio communications in the vicinity of a dud fired missile.
- Approach and work on missiles from the side and rear quarter.
- Do not dismantle or strip dud fired missiles or missile motors.
- Do not transport an unfired missile motor until having shielded the motor igniter from EMR.
- Dispose of unfired missile motors, with or without warheads, in such a manner as to prevent them becoming propulsive.

## 2.2 Demolition Procedures

Electric and non-electric demolition operations, as described below, may be performed by USA Environmental during site excavation activities at Fort McClellan. The method that provides the most positive control over the specific time of detonation is electric. However, situations may occur, such as in an area with a high EMR hazard, when non-electric firing may be the only option.

### *2.2.1 Electric Demolition Procedures*

Personnel performing electrically initiated demolition operations will strictly adhere to the following safety and operating procedures.

### *2.2.2 Safety Considerations*

All demolition preparation procedures shall be conducted at a safe distance ( minimum of 25 feet) from the item(s) to be destroyed. The following safety considerations will be observed.

- Never hook caps to unshunted wire.
- Never leave caps unshunted unless actually testing or hooking to firing wire.
- Observe explosives safety procedures, i.e., do not strike, handle roughly, tamper with or attempt to investigate the contents of the blasting cap.

### *2.2.3 Procedures*

The following procedures will be used to assemble, test, and function electric firing trains.

- Prior to going down range, gather all equipment and explosives.
- Lay out (from the site to the safe area) and test firing wire.

- Ground yourself prior to breaking out caps. Keep explosive end of cap pointed away from the body and other personnel.
- Grip the cap lead wires 3 to 6 inches behind the base of the cap. Pull an initial arm's length of wire off the wire coil.
- Barricade the cap, at least 25 feet from other explosives.
- Unshunt and test blasting cap(s).
- Splice the cap leads to the firing wire in a parallel circuit and insulate connections.
- Prime the shot.
- Return to the safe area and test the circuit for continuity.
- Hook up the firing machine, sound the warning, and fire the shot.

### *2.2.4 Prevention of Electric Misfires*

In order to prevent misfires, insure that:

- All blasting caps are included in firing circuit.
- All connections between blasting cap wires, connecting wires, and firing wires are properly made and short circuits are avoided.
- Grounds are avoided.
- Number of blasting caps in any circuit does not exceed rated capacity of power source on hand.

### *2.2.5 Causes of Electric Misfires*

Common specific causes of electric misfires include:

- Inoperative or weak blasting machine or power source.
- Improperly operated blasting machine or power source.
- Defective and damaged connections, causing either a short circuit, a break in the circuit, or high resistance with resulting low current.
- Faulty blasting caps.
- The use in the same circuit of blasting caps made by different manufacturers or of different design.
- The use of more blasting caps than the power source rating permits.

### *2.2.6 Clearing Electric Misfires*

If a charge is primed electrically, proceed as follows:

- Make several successive attempts to fire.
- Check firing wire connections to blasting machine terminals to be sure that contacts are good.
- Make two or three more attempts to fire charge.
- Disconnect blasting machine and short firing wire.
- A mandatory 30 minute wait will be observed on misfires.
- Test firing circuit with circuit tester for breaks and short circuits, and correct any defects discovered.
- Remove and disconnect old blasting cap(s) and short wires.
- Connect wires of new blasting caps(s) to firing circuit and re-prime charge.
- Reconnect firing wire ends to blasting machine, sound the warning, and fire charge(s).

*NOTE: Wait 30 minutes before proceeding, unless it can be ascertained that the blasting failure is strictly electrical. A malfunctioned cap may have initiated a burning explosive charge. If the misfire is strictly electrical in nature, corrective action may be taken immediately. If the charges are primed with a dual firing system, perform the appropriate procedures for both systems.*

### *2.2.7 Non-Electric Demolition Procedures*

The following safety and operating procedures will be used to assemble and detonate explosive charges using non-electric firing trains.

### *2.2.8 Safety Considerations*

All demolition cap preparation procedures will be conducted at a safe distance (a minimum of 25 feet) from the item(s) to be destroyed and demolition charges. The following safety considerations will be observed:

- Do not strike, roughly handle, tamper with or attempt to remove or investigate the contents of a blasting cap.
- Handle caps only by their open end, except during attachment to time fuse or detonating cord.
- Maintain positive control of caps.
- Do not force time fuse or detonating cord into caps.
- Always point explosive end of caps away from body and other personnel during handling

and crimping.

- Handle primed safety fuse and sensitized detonating cord with care. Avoid contact between caps and/or between caps and other hard objects.
- Do not allow time fuse to coil up and contact itself, other time fuses, or explosives.

### *2.2.9 Basic Procedures (Non-electric):*

- When initiating a non-electric charge, cut fuse long enough to reach a safe distance by walking at a normal pace. Use a minimum of five (5) minutes safe separation time on all shots.
- A minimum of 30 seconds separation time will be observed between multiple non-electric shots initiated simultaneously.
- A mandatory 30 minute wait, plus the burn time of the fuse, will be observed on misfires.
- For all buried charges, use a dual priming system and Detonating Cord. **DO NOT BURY CAPS.**
- The demolition UXO Supervisor will investigate misfires.
- A "Fire in the Hole" warning will be sounded three times verbally and on the radio, prior to firing a shot.

### *2.2.10 Procedures*

Assemble all equipment and explosives. Keep blasting caps away from explosives until priming the shot.

- Test burn time fuse, as described below, at least 25 feet from explosives:
  - Cut, and dispose of on the shot, the first 6 inches of fuse to preclude an inaccurate burn rate or misfire due to moisture; and
  - cut and test burn an appropriate length of fuse (no less than 3 feet) to determine burn rate.
- Compute and cut time fuse to length (minimum 5 minutes) required for safe separation time.
- Inspect cap for foreign matter. Holding cap by the open end, lightly tap wrists together. If the foreign matter remains, dispose of the cap on the shot and use a new cap. Do not blow into cap to clear.
- Crimp cap on time fuse, $^1/_8$ to ¼ inch from the base of the cap, and attach fuse lighter.
- Lay out and weight down time fuse.

- Prime explosive charge, sound the warning, initiate the fuse, and return to the safe area.

### *2.2.11 Non-Electric Misfire Procedures*

Prior to initiating misfire procedures, wait a minimum of 60 minutes plus burning time of fuse, for any part of the disposal shot to elapse before proceeding down range. After the required wait time has elapsed, implement the following steps.

- Up range, prepare a new non-electric firing system to include a new donor charge.
- Proceed down range and place a new charge close enough to the original charge to ensure detonation of both charges. When employing a detonating cord firing system, after the wait time, cut the detonating cord between the cap and the charge, and attach a new firing system to the end of the detonating cord going to the original charge. Destroy the cut detonating cord and cap with the newly primed shot.
- Sound the warning, initiate the new firing system and return to the safe area.

## 2.3 Multiple Sensitive UXOs Destruction Trunk and Branch Line Procedures

Personnel will use the following procedures to explosively link multiple shots, using detonating cord:

- Lay out detonation (Det) cord trunk line from the initiation point to the farthest OE, being careful not to contact the OE with the Det cord. Weighing down (secure) the Det cord as you go.
- Working from the farthest OE to the initiation point, cut Det cord branch lines of sufficient length, to include additional length for knots and overlap, to reach from the trunk line to the OE.
- Prepare one end of the branch line, (i.e., sensitize with a knot).
- Attach the bare end of the branch line to the trunk line;
- Utilizing the sensitized end of the branch line, prime a charge and place it as close as possible to, but not touching, the OE.
- Inspect the trunk and branch lines to make sure none of the primed charges have moved and that no branch line is less than a 90 angle with the trunk line from the direction of initiation.
- Proceed to the initiation point and prepare a firing system, either electric or non-electric, sound the warning and initiate the shot.

## 3. SUMMARY

USA Environmental uses proven procedures and methods to assemble and function both electric and non-electric explosive demolition shots. Only OE-trained personnel will perform tasks associated with the assembly and functioning of demolition charges. The procedures outlined in this SOP are based on industry standards and ensure that operations are performed safely and efficiently.

## 4. REFERENCES

Safety and procedural information relating to demolition procedures is contained within the following reference documents.

AR 200-1, Environmental Protection and Enhancement

AR 385-10, The Army Safety Program

AR 385-16, System Safety Engineering and Management

AR 385-40 w/USACE supplement, Accident Reporting and Records

AR 385-64, Ammunition and Explosives Safety Standards

DA PAM 385-64, Ammunition and Explosives Safety Standards

DoD 4145.26-M, Contractors' Safety Manual for Ammunition and Explosives

DoD 4160.21-M, Defense Reutilization and Marketing Manual

DoD 6055.9-STD, DoD Ammunition and Explosives Safety Standards

OSHA, 29 CFR 1910, Occupational Safety and Health Standards

OSHA, 29 CFR 1926, Construction Standards

TM 9-1300-200, Ammunition General

TM 9-1300-214, Military Explosives

TM 60 Series Publications

USACE EM 385-1-1, Safety and Health Requirements Manual

USA Environmental's Safety and Health Program (SHP)

US Army Engineering and Support Center Safety Considerations for UXOs

US Army Engineering and Support Center ER 385-1-92, Safety and Occupational Health Document, Requirements for Hazardous Waste Remedial Actions

US Department of Transportation, 49 CFR Parts 100 to 199, Transportation (applicable sections)

US Environmental Protection Agency, 40 CFR Parts 260 to 299, Protection of Environment (applicable sections)

# APPENDIX F

# DEMOLITION/DISPOSAL SOP

*Attachment I*

STANDARD OPERATING PROCEDURES (SOP)
EXPLOSIVES STORAGE AND ACCOUNTABILITY

1-1 General

The following USA Environmental policies are not all inclusive nor are they applicable in all situations. This SOP is not a stand-alone document and is to be used together with the Project Work Plan, SSHP, applicable Federal, state, local regulations, and contract restrictions and guidance.

1-2 References

Procedures and information contained in this document were obtained from the below listed references:

- CEHNC Safety Considerations for UXOs;
- ZAPATAENGINEERING Fort McClellan SSHP;
- OSHA, 29 CFR 1910, Occupational Safety and Health Standards;
- OSHA, 29 CFR 1926, Construction Standards;
- Applicable sections of EPA, 40 CFR Parts 260 to 299, Protection of Environment;
- Applicable sections of DOT, 49 CFR Parts 100 to 199, Transportation;
- ATF P 5400.7, ATF-Explosives Law and Regulations;
- CEHNC EM 385-1-1, Safety and Health Requirements Manual;
- CEHNC ER 385-1-92, Safety and Occupational Health Document Requirements for Hazardous Waste Remedial Actions;
- DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards;
- DOD 4160.21-M, Defense Reutilization and Marketing Manual;
- DA PAM 385-64, Ammunition and Explosives Safety Standards;
- AR 385-64, Ammunition and Explosives Safety Standards;
- AR 200-1, Environmental Protection and Enhancement;
- AR 385-10, The Army Safety Program;
- AR 385-16, System Safety Engineering and Management;
- AR 385-40 w/USACE supplement, Accident Reporting and Records;
- TM 9-1300-200, Ammunition General;
- TM 9-1300-214, Military Explosives;
- TM 60 Series Publications.

## 1-2 Storage and Accountability

Demolition operations require the availability and storage of explosive materials. To the maximum extent possible, local government facilities will be used.

1-2.1 USA Environmental will comply with local storage criteria and procedures when using Government facilities. When required to provide explosive storage, USA Environmental will:

- Use portable approved Bureau of Alcohol, Tobacco, and Firearms (ATF) Type 2 structures or existing government furnished magazines;
- Locate, install, and maintain the magazines to comply with the magazine criteria and quantity distance requirements established in DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards;
- Install sufficient magazines to comply with explosive compatibility requirements, (i.e., bulk explosives, initiating explosives, OE; and,
- Establish security, such as fencing and/or guards, to prevent unauthorized access and/or theft.

### 1-2.1.1 Type 2 Outdoor Magazines

A type 2 magazine is a box, trailer, semi-trailer, or other mobile facility.

1-2.1.1.1 Outdoor magazines will be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated. They will be supported to prevent direct contact with the ground and, if less than one cubic yard in size, will be securely fastened to a fixed object. The ground around outdoor magazines must slope away for drainage or provide for adequate drainage. When unattended, vehicular magazines must have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods.

1-2.1.1.2 The exterior and doors are to be of not less than 1/4-inch steel and lined with at least two inches of hardwood. Magazines with top openings will have lids with water-resistant seals or which overlap the sides by at least one inch when in a closed position.

1-2.1.1.3 Hinges and hasps will be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps will be installed so they cannot be removed when the doors are closed and locked. Each door will be equipped with two padlocks fastened in separate hasps and staples. Padlocks must have at least five tumblers and a case-hardened shackle of at least 3/8-inch diameter. Padlocks will be protected with not less than 1/4-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples.

1-3 Accountability

USA Environmental will employ the following procedures to account for explosive materials:

- Control of and access to explosive magazines will be strictly controlled by the Senior UXO Supervisor. All issues and turn-ins of explosives will be properly documented and verified, through physical count, by a quality control specialist.
- On receipt, the type, quantity, and lot number of each explosive item is recorded in the magazine data card and the original receipt documents will be maintained on file by the Senior UXO Supervisor.
- All requests for explosives from the individual operating sites will be reviewed by the Senior UXO Supervisor. Only sufficient explosives for the day's operations will be issued.
- Issues of explosives are recorded on explosive usage records and deducted from the magazine data card(s). This procedure will ensure that the quantities of explosives on-the-floor in the magazine reflect the quantities listed on the magazine data card, and that issued explosives are accounted for while they are in the possession of individual users.
- Entries made on the explosive usage records and magazine data cards will be verified through physical count by the UXO Supervisor with drawing or turning-in the explosives, and the QC Specialist.
- All unused explosives are turned-in at the end of each day, re-entered on the magazine data card and recorded on the explosive usage record.
- At the end of each day, the Senior UXO Supervisor and the UXO supervisor reconcile the entries on each explosive usage record, and will turn these records over to the Project Manager.
- Weekly, the QC specialist will direct a 100% inventory of all explosives on hand. These inspections will include a physical count of the explosives and a comparison of this amount with the amount listed on the individual magazine data cards. Discrepancies and the results of these inventories will be recorded and reported to the Senior UXO Supervisor.

1-4 Transportation of OE and explosives will comply with all Federal, state, and local regulations. Permits are not required under CERCLA for transportation of explosives or conventional OE on-site or on Federal installations. Off-site shipment of conventional ordnance will be made using commercial carriers approved to transport ammunition and explosives, Class A and B, for the Department of Defense. For off-site shipment:

- Conventional ordnance will be packaged IAW 49 CFR part 173;
- drivers will be provided DD Form 836 (Special Instructions for Motor Vehicle Drivers);

- vehicles will be inspected using DD form 626, (Motor Vehicle Inspection), and be properly placarded;
- compatibility requirements will be observed; and,
- the load shall be well braced and, except when in closed vans, covered with a fire-resistant tarpaulin.

1-4 Federal Installations/On-Site

Transportation of explosives and conventional ordnance on-site and on Federal installations will comply with the following:

- Vehicles will be inspected daily using DD form 626, Motor Vehicle Inspection, and will be properly placarded;
- explosives will be transported in closed vehicles whenever possible;
- when using an open vehicle explosives will be covered with a flame resistant tarpaulin (except when loading/unloading);
- vehicle engine will not be running when loading/unloading explosives;
- beds of vehicles will have either a wooden or plastic bed liner, dunnage, or sand bags to protect the explosives from contact with the metal bed and fittings;
- vehicles transporting explosives will have a first aid kit, two 10 BC rated fire extinguishers, and communications capability;
- initiating explosives, such as blasting caps, will remain separated at all times;
- compatibility requirements will be observed;
- operators transporting explosives will have a valid drivers license; and
- drivers will comply with posted speed limits but will not exceed a safe and reasonable speed for conditions. Vehicles transporting explosives off-road will not exceed 25 MPH.