

Draft
Site-Specific Safety and Health Plan Attachment
Remedial Investigation at
Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7),
513(7), 514(7), and 516(7)

Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Task Order CK19
Contract No. DACA21-96-D-0018
IT Project No. 838936

October 2002

Revision 0

The following SSHP has been designed for the methods presently contemplated by the company for execution of the proposed work. Therefore, the SSHP may not be appropriate if the work is not performed by or using the methods presently contemplated by the company. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified. Therefore, the company only makes representations or warranties as to the adequacy of this SSHP for currently anticipated activities and conditions.

This site-specific safety and health plan (SSHP) must be used in conjunction with the installation-wide safety and health plan, and the installation-wide ordnance and explosives management plan, Fort McClellan, Alabama.

Site-Specific Safety and Health Plan Attachment Approval Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the remedial investigation at the Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7) and 516(7) at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

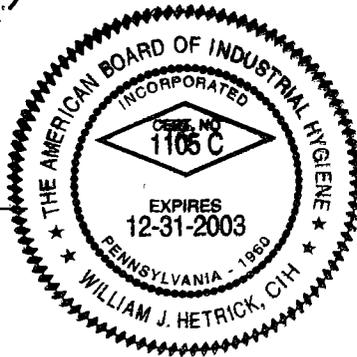


Jeanne Yacoub, PE
Project Manager

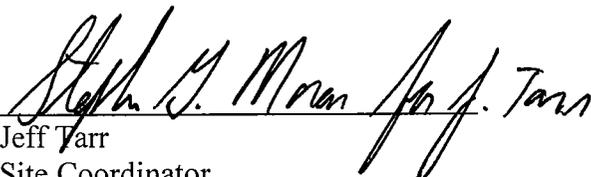
10/3/02
Date



Bill Hetrick, CIH
Health & Safety Manager



9/30/02
Date



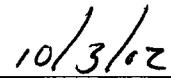
Jeff Tarr
Site Coordinator

10/3/02
Date

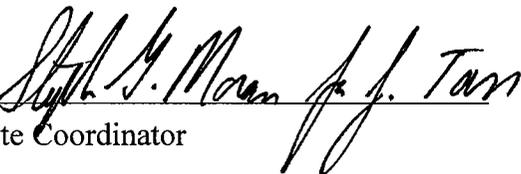
Acknowledgments

The final approved version of this site-specific safety and health plan (SSHP) attachment for the remedial investigation at Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), at Fort McClellan Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every six months until project completion.


Project Manager


Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and the health and safety manager.


Site Coordinator


Date

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
Galloway Gate	Galloway Road. Open 6 am to 6 pm Monday through Friday.

Fort McClellan Project Emergency Contacts

Range Control Office (Main Post).....	(256) 848-6772
Fire Department (off post)	911
Ambulance (off post)	911
Regional Medical Center	(256) 235-5121
DOD Guard Force (Mr. Bolton)	(256) 848-5680, 848-4732
Anniston Police Department.....	(256) 238-1800
Chemical Agent Emergencies.....	(256) 895-1598
(Mike Smith, CEHNC)	cell phone (256) 759-3931
UXO Emergencies	(256) 895-1598
(Mike Smith, CEHNC)	cell phone (256) 759-3931
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-6853
National Response Center & Terrorist Hotline.....	(800) 424-8802
Poison Control Center.....	(800) 222-1222
EPA Region IV	(404) 562-8725
Ronald Levy, BRAC Environmental Coordinator, FTMC Transition Force	(256) 848-6853
Lisa Holstein, FTMC Transition Force.....	(256) 848-7455
Lee Coker, U.S. Army Corps of Engineers, Mobile District.....	(251) 690-3099
Phillip Stroud, Alabama Department of Environmental Management.....	(334) 270-5646
Doyle Brittain, EPA Region IV	(404) 562-8259
Ross McCollum, U.S. Army Corps of Engineers, Mobile District.....	(251) 690-3113
Mike Moore, Fort McClellan Safety Office	(256) 848-5433
Darryl Stabile, U.S. Army Corps of Engineers.....	(251) 690-2784
Jeanne Yacoub, IT Project Manager	(770) 663-1429
Jeff Tarr, IT Site Manager	(256) 848-3482, -3499
Bill Hetrick, IT H&S Manager	Direct dial (865) 692-3571, and pager (888) 655-9529
Dr. Jerry H. Berke, Health Resources Occupational Physician.....	(800) 350-4511

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Attachment 1 – Evaluating OE/UXO/CWM Hazards in Support of HTRW Activities

List of Acronyms

See Attachment 1 of the Site-Specific Field Sampling Plan for the list of Abbreviations and Acronyms.

1.0 Site Work Plan Summary

Project Objective. The objective of this remedial investigation (RI) at Fort McClellan (FTMC), Calhoun County, Alabama, is to collect and analyze samples at Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), under Task Order CK19. Specifically, IT Corporation (IT) will conduct an RI to further characterize and identify potential contamination resulting from training activities that occurred at the sites and to better define the extent of groundwater contamination observed during previous investigations. The data collected will also be utilized to evaluate the level of risk to human health and the environment posed by potential release of site chemicals. The sample media, locations, and analytical parameters are identified in the site-specific field sampling plan (SFSP).

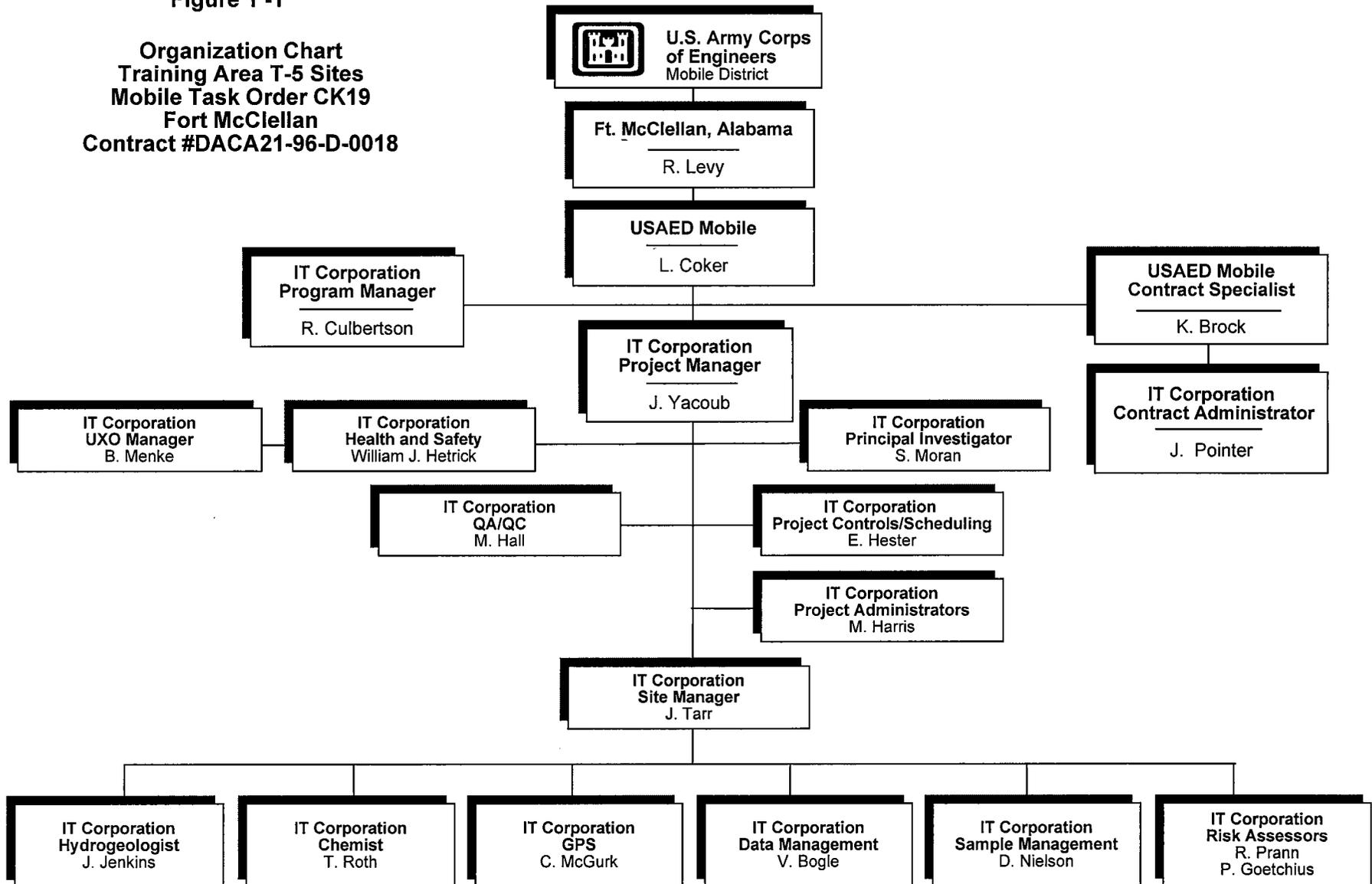
Project Tasks

- Conduct a surface and near-surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO anomaly avoidance support for all intrusive drilling activity to determine the presence of potential downhole hazards.
- Install 22 proposed groundwater monitoring wells (11 residuum and 11 bedrock wells).
- Collect 11 surface soil samples, 11 subsurface soil samples, 10 depositional soil samples, 1 surface water sample, 1 sediment sample, and 48 groundwater samples (22 from proposed monitoring wells and 26 from pre-existing wells)
- Perform slug testing on selected monitoring wells (three bedrock and three residuum wells)

Personnel Requirements. Up to 15 employees. See Figure 1-1 for an organization chart.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan for site investigations at FTMC and shall be familiar with the requirements of this site-specific safety and health plan and UXO safety plan attachment. This site-specific safety and health plan must be used in conjunction with the installation-wide safety and health plan for FTMC, Alabama.

Figure 1 -1
Organization Chart
Training Area T-5 Sites
Mobile Task Order CK19
Fort McClellan
Contract #DACA21-96-D-0018



2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

All of the Training Area T-5 Sites were investigated by Science Applications International Corporation (SAIC) prior to IT's site investigation (SI) in 2001 and 2002. The scope of the SI conducted by IT was outlined *Chemical Warfare Material Sites – Agent ID Area (Parcel 509), Training Area T-6 (Naylor Field) (Parcel 183), Blacktop Training Area (Parcel 511), Fenced Yard in Blacktop Area (Parcel 512), Dog Training Area (Parcel 513), Dog Kennel Area (Parcel 516), Training Area T-5 (Parcel 182), Former Detection and Identification Area (Parcel 180), Old Burn Pit (Parcel 514), CBR Proficiency Area (Parcel 517), and Old Toxic Training Area (Parcel 188), Fort McClellan, Calhoun County, Alabama*. The results of the IT SI are presented in Chapter 2.0 of the RI SFSP.

Parsons Engineering Science, Inc. (Parsons) conducted an engineering evaluation/cost analysis (EE/CA) investigation in 2001 at the chemical warfare material (CWM) sites on Main Post to address the potential presence of CWM or other subsurface disposal using geophysical surveys, excavation of suspect anomalies, continuous air monitoring, soil sampling, and laboratory analysis of the soils for sarin (GB), distilled mustard (HD), nerve agent (VX) and chemical agent breakdown products. The CWM EE/CA investigation did not find any evidence of soil contamination by chemical agent. Based on the results of soil sampling and analysis, it can be inferred that there are not any sources of CWM in the environment on the Main Post; therefore, the likelihood of current or future risk of human exposure to chemical agents is very small. Thus, Parsons concluded that current and future human health risks due to exposure to CWM at this site are very small. As a result of the CWM investigation by Parsons, U.S. Army Corps of Engineers (USACE)-Huntsville Center issued a release of CWM sites on the Main Post to conduct hazardous, toxic, and radiological waste (HTRW) investigations; a copy of this release is attached.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Training Area T-5 Sites. Contaminants of potential concern at the area are metals,

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-5 Sites
Fort McClellan
Calhoun County, Alabama**

(Page 1 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Aluminum [7429-90-5]	NA	NA	Inh Con	Irritating to eyes, skin and respiratory system.	Eye: Irrigate immediately (15min) Breath: Fresh air	15 mg/m ³ (totaldust) 10 mg/m ³ 10 mg/m ³ (totaldust)		PEL TLV REL	ND
Barium [7440-39-3]	NA	NA	Inh Ing Con	Irritating to eyes, skin and upper respiratory system; skin burns, muscle spasms; slow pulse, extrasystoles; hypokalemia	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention.	0.5 mg/m ³ 0.5 mg/m ³ 0.5 mg/m ³		PEL TLV REL	50 mg/m ³ (as Ba)
Cadmium [7440-43-9]	NA	NA	Inh Ing	Pulmonary edema, cough, chest tightness, substernal pain; headache, chills, muscle ache, nausea, vomiting, diarrhea, mild anemia; [carc]	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention.	0.005 mg/m ³ See 29 CFR 1910.1027 0.002 mg/m ³ (respirable) Lowest feasible concentration		PEL TLV REL	9 mg/m ³ (as Cd) Ca
Copper [7440-50-8]	NA	NA	Inh Ing Con	Irritating to eyes, nose, pharynx; nasal perforation; metallic taste, dermatitis in animals; lung, liver and kidney damage	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention.	1 mg/m ³ 1 mg/m ³ 1 mg/m ³		PEL TLV REL	100 mg/m ³ (as Cu)

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-5 Sites
Fort McClellan
Calhoun County, Alabama**

(Page 2 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
DS2	?	?	Inh Ing Con	Direct contact will corrode skin, cause corneal opacification, severe burns, and esophageal stricture; inhalation may cause CNS depression, liver damage, nausea, vomiting, and respiratory irritation. Repeated skin and respiratory exposure can cause skin sensitization and asthma.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention. Give milk/water if conscious.	1 ppm 1 ppm NA Note: TWA values listed for Diethylene Triamine 70% of DS2	- -	PEL TLV REL	
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, sub-sternal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm	PEL TLV REL	?

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-5 Sites
Fort McClellan
Calhoun County, Alabama**

(Page 3 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
GB	?	?	Abs	Anticholinesterase agent producing cholinergic poisoning; tightness in chest, wheezing, increased bronchial secretion, cough, breathing difficulty, pulmonary edema, death; CNS depression, coma, convulsion; sweating; salivation, abdominal cramps, heartburn, belching, diarrhea, involuntary defecation.	Eye: Irrigate immediately. Transfer to medical facility Skin: Remove victim from area immediately. Flush skin and clothes with bleach within 1 minute. Cut and remove contaminated clothing, then wash skin again with bleach and then with soap and water. Transfer to medical facility. Breath: Remove from area immediately. Transfer to medical facility.		C0.0001 mg/m ³	AEL	0.2 mg/m ³
Hydrogen chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C5 ppm C5 ppm C5 ppm	PEL TLV REL	100 ppm
Iron [1309-37-1]	NA	NA	Inh	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis	Breath: Respiratory support	10 mg/m ³ 5 mg/m ³ 5 mg/m ³		PEL TLV REL	2500 mg/m ³ (as Fe)

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-5 Sites
Fort McClellan
Calhoun County, Alabama**

(Page 4 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsi- ness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm	PEL TLV REL	2,000 ppm (10% LEL)
Lewisite (Arsenic trichloride)	?	?	Inh Con	Blister agent. Geranium-like odor. Systemic poison causing pulmonary edema, diarrhea, restlessness, subnormal temperature, and low blood pressure.	Eye: Irrigate immediately. Transfer to medical facility Skin: Remove victim from area immediately. Flush skin and clothes with bleach within 1 minute. Cut and remove contaminated clothing, then wash skin again with bleach and then with soap and water. Transfer to medical facility. Breath: Remove from area immediately. Transfer to medical facility.		0.003 mg/m ³	AEL	
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention		200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm
Motor oil [NA]	?	?	Inh Ing	See oil mist; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-5 Sites
Fort McClellan
Calhoun County, Alabama**

(Page 5 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Mustard gas	?	0.0006 mg/m ³	Abs Inh	Garlic-like odor. Eye and respiratory tract irritation; redness of skin and blisters develop 4 to 24 hours after exposure; hoarseness, sore throat, coughing, pulmonary edema	Treat like a thermal burn. Do not break blisters. Eye: Irrigate immediately. Transfer to medical facility Skin: Remove victim from area immediately. Flush skin and clothes with bleach within 1 minute. Cut and remove contaminated clothing, then wash skin again with bleach and then with soap and water. Transfer to medical facility. Breath: Remove from area immediately. Transfer to medical facility.		C0.003 mg/m ³	AEL	0.5 mg/m ³
Nitric acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Phosgene (CG)	?	?	Inh Con	Irritated eyes, nose and upper respiratory tract; wheezing and difficulty in breathing; eye and skin burns; pulmonary edema.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support	0.1 ppm 0.1 ppm 0.1 ppm	15-minute ceiling 0.1 ppm	PEL TLV REL	2 ppm
Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	10 mg/m ³ 15 mg/m ³ respirable fraction 10 mg/m ³ (total dust)		TLV PEL REL	5000 mg/m ³

Table 2-1

Toxicological and Physical Properties of Chemicals
 Training Area T-5 Sites
 Fort McClellan
 Calhoun County, Alabama

(Page 6 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
1,1,2,2- Tetrachloroethane [79-34-5]	11.10	0.233	Inh Abs Ing Con	Nausea, vomiting, abdominal pain; finger tremors, jaundice, liver tenderness, kidney damage; [carc]	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	5 ppm (skin) 1 ppm (skin) 1 ppm (skin)		PEL TLV REL	Ca 100 ppm
1,1,2 Trichloroethane [79-00-5]	11.00	21	Inh Abs Ing Con	Irritating to eyes, nose; CNS Depressant; liver, kidney damage, dermatitis; [carc]	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	10 ppm 10 ppm 10 ppm		PEL TLV REL	Ca 100 ppm
Trichloroethylene (TCE) [79-01-6]	9.45	20	Inh Abs Ing Con	Irritating to eyes, skin, headache, vertigo; visual disturbance, fatigue, giddiness, tremor, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [carc]	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 50 ppm 25 ppm (10-hrTWA)	C 200 ppm 100 ppm	PEL TLV REL	Ca 1000 ppm
VX	?	?	Abs	Anticholinesterase agent producing cholinergic poisoning; tightness in chest, wheezing, increased bronchial secretion, cough, breathing difficulty, pulmonary edema, death; CNS depression, coma, convulsion; sweating; salivation, abdominal cramps, heartburn, belching, diarrhea, involuntary defecation.	Eye: Irrigate immediately. Transfer to medical facility Skin: Remove victim from area immediately. Flush skin and clothes with bleach within 1 minute. Cut and remove contaminated clothing, then wash skin again with bleach and then with soap and water. Transfer to medical facility. Breath: Remove from area immediately. Transfer to medical facility.		C0.00001 mg/m ³	AEL	0.4 mg/m ³

Table 2-1

**Toxicological and Physical Properties of Chemicals
Training Area T-5 Sites
Fort McClellan
Calhoun County, Alabama**

(Page 7 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Zinc [1314-13-2]	NA	NA	Inh	Metal fume fever; chills, muscle ache, nausea, fever, dry throat, cough, weakness; metallic taste, blurred vision, low back pain, chest tightness	Breath: Respiratory support	5 mg/m ³ 5 mg/m ³ 5 mg/m ³		TLV PEL REL	500 mg/m ³

^aIP = Ionization potential (electron volts).

^bRoute = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.

^cTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^dSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

^ePEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

^fIDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, PubNo. 90-117, 1990).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

Table 2-1

Toxicological and Physical Properties of Chemicals Training Area T-5 Sites Fort McClellan Calhoun County, Alabama

(Page 8 of 8)

References:

- American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1991, compiled by the American Conference of Governmental Industrial Hygienists.
- Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," *Journal of Applied Toxicology*, 1983.
- Clayton, George D., Clayton, F. E., *Patty's Industrial Hygiene and Toxicology*, 3rd ed., John Wiley & Sons, New York.
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- Fazzuluri, F. A., *Compilation of Odor and Taste Threshold Values Data*, American Society for Testing and Materials, 1978.
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- National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1990, No. 90-117, National Institute for Occupational Safety and Health.
- Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
- Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
- Verschuseren, K., *Handbook of Environmental Data on Organic Chemicals*, Van Nostrand and Reinhold, 1977.
- Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
- Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

1 semivolatile organic compounds, volatile organic compounds, CWM breakdown products, and
2 CWM decontamination solutions. Site-specific contaminants of potential concern at the Training
3 Area T-5 Sites are summarized in Section 2.2, General Site Information, Site Descriptions and
4 History.

5
6
7 Attachment 1, *Evaluating OE/UXO/CWM Hazards in Support of HTRW Activities*, has been
8 prepared to identify additional ordnance and explosive (OE) site information. Although the
9 evaluation has determined that the potential for exposure to CWM is low, supplied air
10 emergency escape/egress packs will be worn concurrent with the UXO downhole monitoring to a
11 minimum intrusive depth of 12 feet below ground surface (bgs). Beyond the 12-foot depth, the
12 UXO magnetometer use is discontinued because the likelihood of any OE at that depth or deeper
13 is remote and not probable. Beyond the 12-foot depth, concurrent with the discontinuation of
14 downhole magnetometer monitoring, egress units may be removed from the wearer but must
15 remain operational and accessible to the employee in the event they may be required. It is not
16 suitable to place the units on the ground or commingled with other equipment. The units must be
17 kept in the immediate area of the employee(s) who would use them. In addition, if concurrent
18 and adjacent intrusive activities (e.g., multiple drill rigs) require emergency escape respirators, or
19 if the site safety and health officer (SSHO) and task geologist determine the intrusive activity is
20 in previously disturbed soil (e.g., burial site or landfill), the use of the units by all personnel will
21 be required regardless of the depth or until all operations have reached a depth greater than 12
22 feet or native, nondisturbed soil is encountered.

23
24 The possibility of UXO exists at Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7),
25 513(7), 514(7), and 516(7); therefore, UXO surface sweeps and downhole surveys of soil borings
26 will be required to support field activities. The surface sweeps and downhole surveys will be
27 conducted to identify anomalies for the purposes of UXO avoidance.

28 29 **2.2 General Site Information**

30
31 **Duration of Planned Employee Activity.** Employee activity duration is anticipated to be
32 approximately three to four months.

33
34 **Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and**
35 **516(7) Site Descriptions and Histories.** Descriptions of the Training Area T-5 Sites,
36 Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7), are summarized below from

1 the SI SFSP and the Parsons 2002, *Final Chemical Warfare Materiel (CWM) Engineering*
2 *Evaluation/Cost Analysis (EE/CA)*.

4 **Site Descriptions and History**

6 **Former Detection and Identification Area, Parcel 180(7).** The Former Detection and
7 Identification Area, Parcel 180(7), is located southwest of Building 3185 and covers an area of
8 approximately one-half acre on the west side of Rucker Street (formerly 13th Avenue). This area
9 was used from some time in the 1950s until 1973 for training in the detection and identification
10 of CWM. The CWM used at this location may include simulants, HD, GB, carbonyl chloride
11 (CG), cyanogen chloride (CK), dichloroformoxime, hydrogen cyanide (AC), and the
12 decontaminants supertropical bleach (STB), and Decontamination Solution Number 2 (DS2). It
13 is also believed that the U.S. Navy used the site in the late 1950s for the detection of HD.
14 Parsons lists the agent simulants, CK, CG, phosgene oxime (CX), and AC as possibly being used
15 in training exercises. Portions of this area are currently fenced and posted.

17 Weston reported that several types of live CWM may have been used here and that STB and DS2
18 were used on surface soils, presumably during final decontamination before the U.S. Army
19 Chemical School transferred from FTMC to the Aberdeen Proving Ground, Edgewood Area, in
20 1973. At some time before 1973, a pit was dug on the site and all training aids (i.e. structures)
21 from the site, as well as a building from Area T-4, were burned twice and buried. This pit still
22 retained the contents of that burial and was reportedly marked for location with a marker (Stake
23 F). Based on a notation on a site map in the Installation Assessment Records, a location in the
24 northern portion of the site was used for GB demonstration on goats.

26 Personnel interviewed during the environmental baseline survey (EBS) site visit who had
27 participated directly in operations at this site report that no training materials (i.e., CWM)
28 contacted the ground and that no disposal activities occurred at this location, to the best of their
29 knowledge. Accounts of personnel interviewed during the EBS site visit differ regarding the
30 CWM used. Some sources indicate that only simulants were used at this location, while others
31 recall that dilute CWM-containing mixtures were used to train troops. Vials of simulated CWM
32 (dilute live CWM, according to some sources) were reportedly placed into containers atop poles
33 in the training area. The poles were approximately three feet tall, approximately 24 in number,
34 and are visible on 1964 aerial photos. Simulant chemical agent identification training set
35 (SCAITS) kits were used at the Former Detection and Identification Area. Vials in old SCAITS
36 kits of the 1950s reportedly contained a very low concentration of CWM. There were not any
37 spills reported at this site. In 1973, the surface was declared clean by the U.S. Army Toxic and

1 Hazardous Materials Agency and the FTMC U.S. Army Chemical School, and the area was
2 authorized for surface use only.

3
4 FTMC personnel reported that other training activities known as “G-shoots” were conducted at a
5 VX demonstration area in the northern portion of the fenced Former Detection and Identification
6 Area. The chemical warfare agent (CWA) GB was used in this training. The operation involved
7 placing one drop of GB on the nose of a goat, observing symptoms, then reviving the animal
8 with an intramuscular atropine injection. Reportedly, there was very little chance of CWA
9 release during this exercise, due to the small quantities on hand and controlled usage.

10
11 An SI completed in 1993 by SAIC included four soil samples collected from two locations at
12 depths of about one foot and six feet. The two sampling locations were in the disposal pit and in
13 the location where the materials were burned. The samples were screened for HD and GB by the
14 U.S. Army Technical Escort Unit using the miniature continuous air monitoring system
15 (MINICAMS) and nothing was detected above background readings. Laboratory analysis for
16 degradation products was also negative.

17
18 In 1994, SAIC conducted an RI at the Former Detection and Identification Area using
19 geophysical surveys, trenching, and soil sampling. Numerous geophysical anomalies were
20 detected, some of which may indicate buried metallic or nonmetallic material. Four test pits
21 were excavated, and four soil borings were drilled and sampled. Materials excavated from the
22 test pits included construction debris (concrete and rebar). One soil sample was collected from
23 each of the test pits. Samples were screened in the field for the presence of HD and GB and then
24 sent to the laboratory for analysis of HD and GB breakdown products. No HD, GB, or their
25 breakdown products were detected in any of the soil samples or in samples collected from this
26 area previously.

27
28 Analysis of historical aerial photographs by Parsons revealed past activity at this site and during
29 the period for which CWM was reportedly used at this location. Most of the entire site was
30 cleared of vegetation. There were not any disposal areas visible from the aerial photographs and
31 no other potential areas of concern were identified. Parsons walked the site during a February
32 1999 site visit. "Stake F," used to mark the location of the former burial site, was not located
33 during the February 1999 reconnaissance. What appeared to be one of the three-foot poles used
34 in training was located at the site. There were not any other ground disturbances or areas of
35 concern identified at the site.

1 **Training Area T-5, Parcel 182(7).** Training Area T-5 is also known as the Former Area T-5:
2 Former Toxic Hazards Detection and Decontamination Training Area. It is located between
3 Sunset Hill and Howitzer Hill, south of Building 3174, at the end of Rucker Street (formerly 13th
4 Avenue). The site covers approximately 10.5 acres. For the purposes of investigation, the Dog
5 Kennel Area, Parcel 516(7), was separated from the Training Area T-5, Parcel 182(7), to be
6 investigated with the Dog Training Area, Parcel 513(7). Training Area T-5 was reportedly used
7 from 1961 to 1973. The site is posted and partially fenced (the fence is missing at the northern
8 boundary). The operations conducted here reportedly involved detection and decontamination of
9 CWM, including HD, VX, GB, and the biological simulants *Bacillus globigii* (BG) and *Serratia*
10 *marcescens* (SM). The decontaminant chemicals STB and DS2 were probably also used here.
11 Training was likely confined to small sites within a fenced, controlled area.

12
13 Personnel interviewed during the EBS site visit report that explosive ordnance disposal (EOD)
14 personnel formerly conducted “render-safe” exercises on munitions (typically artillery shells) in
15 this area. EOD personnel placed the munition on the ground and poured a vial of a specific live
16 CWA over the munition. The EOD reaction team then identified the CWA, decontaminated the
17 munition, and packed it for transport. Exercises reportedly took place no more than 50 meters
18 off the road. Some reports maintain that training at Training Area T-5 used simulated CWM
19 rounds only and that water was used as the decontaminant rather than STB or DS2. Training
20 sites were decontaminated and checked at the completion of each exercise. Following
21 completion of training at this site, all excavations were filled in accordance with standard
22 operating procedures; training aids were decontaminated, burned twice, and sent to the landfill,
23 or they were renovated and shipped to Redstone Arsenal.

24
25 Previous reports speculated that this may have been the site of a 110-gallon HD spill which
26 reportedly occurred in 1955. None of the personnel interviewed during the EBS site visit could
27 recall a 110-gallon spill, nor could they imagine a scenario during which a spill of this magnitude
28 could occur. However, the HD simulant molasses residuum was delivered in 55-gallon drums.
29 Site soils were reportedly chemically decontaminated, excavated, and disposed of at Range J.

30
31 In 1972 and 1973 the Army collected shallow soil samples from Training Area T-5 and analyzed
32 them for HD, GB, and VX. There were not any CWAs detected in these samples, and the area
33 was permitted for surface use only. Field screening and laboratory analysis of additional soil,
34 sediment, and surface water samples collected at high-probability locations did not detect HD,
35 GB, VX, or their degradation products.

1 The SI completed by SAIC in 1993 included soil samples collected from four high-probability
2 locations at depths of about one foot and five to six feet and one surface water and sediment
3 sample collected from a tributary to Cane Creek. The samples were screened for HD, VX and
4 GB by U.S. Army Technical Escort Unit using the MINICAMS and nothing was detected above
5 background readings. Laboratory analysis for degradation products was also negative. This
6 report concluded that, based on this sampling and the protocols for decontamination used at the
7 time, the likelihood of CWM on the site was reduced.

8
9 Investigations conducted during the SAIC RI included field screening for CWM and CWM
10 breakdown products and soil, surface water, and sediment sampling. Ordnance was observed in
11 Training Area T-5 and appeared to be the result of recent U.S. Army training using dummy
12 rounds. The RI conducted in 1995 included four shallow soil samples, two sediment and surface
13 water samples, and numerous shallow soils (44) screened on-site using the MINICAMS.
14 Locations for sampling were based on historical documentation for the site, including training
15 location sketches and photographs of training activities. Analyses were conducted for HD, VX,
16 and degradation products with negative results. Recommendations of the SAIC RI were that no
17 further investigation was necessary but that the site should be cleared of training ordnance prior
18 to site release.

19
20 ***Blacktop Training Area, Parcel 511(7), and Fenced Yard in Blacktop Area, Parcel***
21 ***512(7).*** The Blacktop Training Area, Parcel 511(7), is addressed with the Fenced Yard in the
22 Blacktop Area, Parcel 512, as identified in the USACE *Archive Search Report* (ASR). The area
23 is a little over three acres and is primarily an “asphalt parking lot” type area located area along
24 the east side of Reggie Avenue (formerly 12th Avenue) with viewing stands (bleachers) on both
25 ends of the area and an inner fenced-in portion. The fenced yard in the Blacktop Area is almost
26 one-half acre in addition to the three acres in the Blacktop Area. The fence was removed at
27 some unknown date, but parts of the fence posts remain.

28
29 The Blacktop Training Area was identified on the 1956 map of the Chemical Corps Training
30 Areas and on the 1969 Chemical School Orientation Map. Various demonstrations may have
31 taken place here, such as decontamination training, but its exact use is unknown. The area was
32 reportedly used for training in the use of flamethrowers, decontamination equipment, and smoke
33 generators. The Fenced Yard, enclosed by the high fence, was believed to have been used to
34 store agent or for toxic agent training. However, it may be a more recent structure.

35
36 The analysis of historical aerial photographs shows that the area was cleared in the early 1940s
37 and paved sometime after the 1954 aerial photograph was taken. After the area was paved, very

1 few changes occurred that are visible in the aerial photographs. The one change that did occur
2 was that the fenced area (Fenced Yard in Blacktop Area, Parcel 512) on the western edge of the
3 pavement first shows up in the 1982 aerial photograph. Anomaly features seen on the
4 photographs at the north and south ends of the paved area are bleachers, suggesting that training
5 demonstrations took place here.

6
7 There is not any record of sampling conducted at this site in the past. During the CWM EE/CA
8 investigation by Parsons, only soil sampling and analysis were conducted. Eighteen hand-
9 augered borings were advanced below the blacktop to collect soil samples. During the soil
10 sampling, continuous air monitoring was done using the MINICAMS, Open Path Fourier
11 Transform Infrared (OPFTIR), and photoionization detector (PID). The locations were randomly
12 located over the site. Soil samples were collected from each boring at 0.5 to 1 foot and 3.5 to 4
13 feet bgs. The samples were screened for GB and HD agents by Edgewood Chemical/Biological
14 Command (ECBC) prior to Parsons shipping the samples to ECBC's laboratory. The samples
15 were analyzed for GB and HD. No concentrations were detected above the reporting limits.

16
17 Historical documents do not indicate the use of specific CWM at this site. Decontamination
18 training may have taken place, and it is not known if live agent was used. The fenced area may
19 have been used for storage or demonstrations of agent, but no documented evidence of such use
20 was found. Training involving flame and smoke agents has also been reported for this site;
21 however, these activities are no longer considered CWM-related.

22
23 ***Dog Training Area, Parcel 513(7), and Dog Kennel Area, Parcel 516(7).*** The Dog
24 Training Area, Parcel 513(7), is located at the south end of Reggie Avenue (formerly 12th
25 Avenue) and near the Dog Kennel Area, Parcel 516(7). The area has been recently mowed and
26 cleared; however, it is no longer in use. Both areas are approximately one-acre sites.

27
28 The site was used for training dogs for the U.S. Army Military Police School, and remnants of
29 the training obstacles were still in existence in September 1998 but have since been removed
30 (Parsons, 2002). A large, blistered/corroded concrete pad which was surrounded by a high fence
31 is located within the area and may have been used to store agents or to conduct toxic agent
32 training in "Transfer Operations," since the Depot Area was across the road from this area
33 (USACE, 1999).

34
35 An analysis of historical aerial photographs revealed that this area contained numerous buildings
36 in the 1940s, and the concrete pad is one of many building foundations from that era. More

1 recent aerial photos showed several cleared areas that were likely used for dog training, but there
2 are not any suspect CWM training areas.

3
4 A site visit by Parsons in February 1999 showed the area was cleared of former dog training aids
5 except for the concrete pad located at the site. This pad is heavily blistered and corroded, unlike
6 other foundation pads in the vicinity.

7
8 During the CWM EE/CA investigation by Parsons, only soil sampling and analysis were
9 conducted at the Dog Training Area, Parcel 513(7). Two hand-augered borings were advanced
10 adjacent to the pad to collect soil samples for analysis. Soil samples were collected from each
11 boring at 0.5 to 1 foot and at 3.5 to 4 feet bgs. Continuous air monitoring was conducted using
12 the MINICAMS, OPFTIR, and PID during soil sampling. The samples were screened for GB
13 and HD agents prior to Parsons shipping the samples to the laboratory. The samples were
14 analyzed for GB and HD. No concentrations were detected above the reporting limits. Also, soil
15 analytical results from representative locations indicate that no agent or degradation products are
16 present.

17
18 The Dog Kennel Area was identified in the ASR as having a possible storage area in the inner
19 yard that could have been used for toxic agents. The Dog Kennel Area is shown on the 1969
20 Chemical School Orientation Map as being a part of Training Area T-5. Mustard confidence
21 training, which used drops of mustard, may have taken place within the Quonset hut located
22 inside the perimeter fence. However, historical aerial photographs did not indicate the likelihood
23 of disposal in these areas. Small quantities of HD may have been used at this site. However, the
24 reported use would likely have occurred within the confines of the structure in the fenced area.
25 Parsons found no evidence of a burial pit at the site during a site visit.

26
27 **Old Burn Pit, Parcel 514(7).** The Old Burn Pit, Parcel 514(7), is located in the woods behind
28 Motor Pool 3100 on Rucker Street (formerly 13th Avenue) and covers an area of 0.15 acres. It is
29 across the dirt road and just to the west of the northwest corner of the Former Detection and
30 Identification Area, Parcel 180(7). This site was identified for consideration during the field visit
31 to collect information for the ASR. The site appeared to be a burn pit. Although nothing is
32 known about the site and this area is not specifically listed as hosting chemical training, it was
33 selected for further sampling to ensure that CWM was not present.

34
35 The aerial photograph analysis conducted by Parsons does show a well defined cleared area in
36 the 1961 aerial photograph that coincides with the location of the burn pit. A site visit by
37 Parsons in February 1999 revealed the area behind Motor Pool Area 3100 to be wooded, but the

1 remains of the pit were still visible. The pit was covered over with a wire mesh and contained
2 some remnant metallic objects within it.

3
4 Three depressions near the Old Burn Pit were investigated intrusively by Parsons using hand
5 tools. During the excavations, continuous air monitoring was done using the MINICAMS,
6 OPFTIR, and PID. Investigation of Burn Pit 1 was the primary objective of the CWM EE/CA
7 study at this site. Pit 1 was found to contain multiple inert and practice OE items, as well as
8 other metal debris. Pit 2, which was noted during the CWM EE/CA investigation of Burn Pit 1,
9 contained a steel box with cans, wire-wrapped cans, plate glass, and a dummy grenade. Pit 3,
10 also identified during the CWM EE/CA field work, contained flakes of rust and jar lids. No
11 evidence, such as charred wood, suggested that these pits were ever used for burning.

12
13 OE items encountered during the intrusive investigation at the Old Burn Pit included practice
14 rifle grenade bodies, 60 millimeter (mm) practice mortar rounds, a 81mm mortar round, a mortar
15 tail fin, rifle grenade tail booms, and .30-caliber casings. The OE items were vented and/or
16 certified to be inert and were disposed of as scrap to Oxford Scrap Metal Company. No evidence
17 of CWM was found; the items recovered were all conventional ordnance-related. Metallic
18 anomalies were still present in the sidewalls of the pits following termination of the pit
19 investigations by Parsons.

20
21 Based a historical review and the sampling and analysis activities performed during the CWM
22 EE/CA investigation and other types of investigations, Parsons concluded that no residual
23 chemical agents or degradation products exist in the sampled media. Therefore, the probability
24 of current or future risk of human exposure to chemical agents is very small. Parsons
25 recommended “no further action” for Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and
26 516(7). In addition, any warning signs for CWM previously posted at these sites as
27 precautionary measures should be removed.

28
29 As a result of the CWM EE/CA investigation by Parsons, USACE-Huntsville Center issued a
30 release of CWM sites on the Main Post to conduct HTRW investigations.

31 32 **2.3 Pathways for Hazardous Substance Dispersion**

33 Possible pathways for hazardous substances in the area are groundwater and soils. The primary
34 exposure routes include inhalation, absorption, and ingestion.

1 **Site Topography.** The elevation at Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7),
2 512(7), 513(7), 514(7), and 516(7), ranges from approximately 800 feet to 925 feet above mean
3 sea level, and the sites encompass approximately 16 acres.
4

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a complete description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment and UXO avoidance surface sweeps and soil surveying	Level D
Collecting surface soil, surface water, sediment and depositional soil samples	Level D
Installing monitoring wells and collection of groundwater and subsurface soil samples	Modified Level D*
Slug testing	Modified Level D

* Initial level will be raised to Level C or higher if air monitoring results for volatile organic compounds in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent (polycoated Tyvek for pressure washing)
- Latex boot covers
- Outer Nitrile, heavy work, or latex gloves
- Latex or lightweight nitrile gloves (inner)
- Steel-toed safety boots
- Safety glasses

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- Hard hat
- Hearing protection (when working near/adjacent to operating equipment)
- Supplied air emergency escape/egress pack (required for all intrusive drilling activities).

Note: In addition to modified Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for foot protection, leg guards, and a face shield.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health-approved full-face, air-purifying respirator equipped with organic vapor/acid gas/P100 cartridge
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).
- Supplied air emergency escape/egress pack (required for suspect chemical agent sites).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for foot protection, and leg guards, and a face shield can be used to minimize water spray on the respirator lens and respirator cartridges.

4.0 Site Monitoring

The environmental contaminants of concern at the area include metals, volatile and semivolatile organic compounds, potential CWM, and CWM decontaminants. Table 4-1 contains the action levels for real-time air monitoring at the sites.

Chemical. Air monitoring will be performed by the site SSHO or qualified task geologist during the performance of ground-intrusive operations. A calibrated PID (i.e., HNu DL 101 or equivalent) organic vapor analyzer with a 10.2 or higher electron volt lamp will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the work areas and BZs to determine if any combustible/flammable oxygen levels may be present that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at the work sites.

Unexploded Ordnance. UXO safety will be achieved by employing UXO specialists to ensure that field personnel do not come into contact with UXO. In areas where UXO is suspected, the UXO specialists will perform the following UXO avoidance operations.

- **Area UXO Surveys Using Magnetometers.** During this operation, UXO on the surface will be detected and marked for avoidance during field operations. Metal objects just below the surface will also be marked to indicate the potential hazard.
- **Downhole UXO Surveys.** UXO specialists will perform downhole magnetometer surveys to detect metal objects in the path of the boring apparatus until undisturbed soils are reached. The boring location will be moved if subsurface metal objects are detected.

If UXO is encountered, personnel will contact the site manager and UXO specialist immediately. Personnel will evacuate the immediate area and secure it.

Table 4-1
Action Levels
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level ^a	Required Action ^b
Volatile Organic Compounds (VOC)	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B PPE if CIH concurs
Oxygen	≥ 20%, ≤23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Note: The Health and Safety Manager (CIH) must be immediately notified if action levels trigger Level B PPE upgrade.

When in Level D Modified/D PPE

Analyte	Action Level ^a	Required Action ^b
VOCs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE
Oxygen	≥ 20%, ≤23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1
Action Levels
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

Analyte	Action Level ^a	Required Action
VOCs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

**Air Monitoring Frequency and Location
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	BZ of employees
Land Survey	OV Monitor	Initially for area	BZ of employees
Sampling surface soil/water; depositional and sediment	OV Monitor	Continuously	BZ of employees
Installing monitoring wells and subsurface soil sampling	OV Monitor LEL/O ₂ Monitor	Continuously Continuously	BZ of employees and/or work area
Groundwater sampling	OV Monitor	As needed	BZ of employees
Slug testing	OV Monitor	As needed	BZ of employees

BZ = Breathing zone.

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

1 **5.0 Activity Hazard Analysis**

2
3 The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- 4 • Staging equipment
- 5
- 6 • Land survey
- 7
- 8 • Surface/subsurface soil, groundwater, surface water, depositional/sediment
- 9 sampling and slug testing
- 10
- 11 • Installation of monitoring wells
- 12
- 13 • Moving and shipping collected samples
- 14
- 15 • Disposal of investigation-derived waste
- 16
- 17 • High-pressure water jetting.
- 18

19
20 All injuries and illnesses must be immediately reported to the site manager or the site SSHO,
21 who will then notify off-site personnel and organizations as necessary.

22
23 If hospital care must be provided, the victim shall be treated at Northeast Regional Medical
24 Center, 400 East 10th Street, Anniston, Alabama. The telephone number is (256) 235- 5121.
25 Directions to the hospital are provided in Figure 5-1.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 12)

Activity	Potential Hazards	Recommended Controls
Staging equipment	Unexploded ordnance (UXO)	<ul style="list-style-type: none"> • UXO specialists will perform UXO surface avoidance and/or UXO downhole avoidance. See site-specific safety and health plans (SSHP) to determine if required.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Determine best access route before transporting equipment. • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing.
	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	<ul style="list-style-type: none"> • Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	<ul style="list-style-type: none"> • Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	<ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	<ul style="list-style-type: none"> • Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	<ul style="list-style-type: none"> • Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	<ul style="list-style-type: none"> • Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	<ul style="list-style-type: none"> • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hazard communication	<ul style="list-style-type: none"> • Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site. • Employees will receive site-specific training to the SHP and SSHP and UXO safety plan.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 decibels (dBA) mandates hearing protection.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 12)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Lighting	<ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	<ul style="list-style-type: none"> • Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing separately that has contacted poisonous plants from non contaminated clothing. • Wash affected areas immediately with soap designed for poisonous resin removal and water.
	Heat rash	<ul style="list-style-type: none"> • Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none"> • Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 12)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> • Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow. • Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. • Barriers shall be used to protect workers from vehicular traffic. • Barriers shall be used to guard excavations adjacent to streets or roadways. • Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. • Heavy equipment shall have backup alarms.
	Forklift operations	<ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	<ul style="list-style-type: none"> • Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. • Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. • Electrical tools shall be inspected daily prior to use.
	Extension cords	<ul style="list-style-type: none"> • Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. • Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. • Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.). • Cords shall be designed for hard duty. • Cords shall be inspected daily.
	Lightning strikes	<ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 12)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Thunderstorms, tornadoes	<ul style="list-style-type: none"> • Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado.
Land surveying	Slip, trip, fall	<ul style="list-style-type: none"> • Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials.
	UXO	<ul style="list-style-type: none"> • UXO specialists will perform UXO surface and shallow subsurface avoidance and anomaly location identification.
	Traffic accidents	<ul style="list-style-type: none"> • Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion. • Employees shall have received defensive driving training when operating company owned, leased or rented vehicles.
	Wildlife hazards	<ul style="list-style-type: none"> • Workers should be cautious when driving through the site in order to avoid encounters with passing animals. • Do not attempt to feed or capture any wildlife encountered on project sites.
	Biological hazards	<ul style="list-style-type: none"> • Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 12)

Activity	Potential Hazards	Recommended Controls
Land surveying (continued)	Ticks and mosquitoes	<ul style="list-style-type: none"> • Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area. • Drain open containers of rainwater and standing water accumulated on drums staged for excess periods of time.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing separately that has contacted poisonous plants from non contaminated clothing. • Wash affected areas immediately with soap designed for poisonous resin removal and water.
Surface/subsurface soil, groundwater, depositional sampling and slug testing	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities and as needed to protect employees. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	UXO	<ul style="list-style-type: none"> • UXO specialists will perform UXO surface avoidance and/or UXO downhole avoidance. • Surface and shallow subsurface anomalies shall be marked for the purpose of employee avoidance.
	Cut hazards	<ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	<ul style="list-style-type: none"> • MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents. • Employees will receive site-specific training to the SHP and SSHP and UXO safety plan.
	Strains/sprains	<ul style="list-style-type: none"> • Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc. • Use proper lifting techniques and get help or heavy equipment assistance for lifts greater than 60 pounds.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 12)

Activity	Potential Hazards	Recommended Controls
Surface/subsurface soil, groundwater, depositional sampling and slug testing (continued)	Unattended worker	<ul style="list-style-type: none"> • Use the "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards.
	Bees, spiders, and snakes	<ul style="list-style-type: none"> • Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. • Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing separately that has contacted poisonous plants from non contaminated clothing. • Wash affected areas immediately with soap designed for poisonous resin removal and water.
	Cold stress	<ul style="list-style-type: none"> • Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Access/egress hazards	<ul style="list-style-type: none"> • Use qualified and trained bushhog operator. • Keep employees out of the bushhog work area. • Utilize good housekeeping practices. • Keep aisleways, pathways, and work areas free of obstruction. • Clean ice or snow off of walkways or work stations. • Use appropriate footwear for the task assigned.
	Heat rash	<ul style="list-style-type: none"> • Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 12)

Activity	Potential Hazards	Recommended Controls
Surface/subsurface soil, groundwater, depositional sampling and slug testing (continued)	Heat cramps	<ul style="list-style-type: none"> • Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	Lightning strikes	<ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornadoes	<ul style="list-style-type: none"> • Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorms or tornado warnings. • Seek shelter. Do not try to outrun a tornado.
	UXO	<ul style="list-style-type: none"> • UXO specialist will perform UXO surface avoidance and/or UXO downhole avoidance.
Installation of Monitoring Wells	Overhead hazards	<ul style="list-style-type: none"> • Make sure no obstacles are within radius of boom. Always stay a safe distance from power lines. • Keep clear of suspended drill rod and augers. Use tag lines if needed to prevent employees from working under suspended loads.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 12)

Activity	Potential Hazards	Recommended Controls
Installation of Monitoring Wells (continued)	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"> • All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. • Equipment will be inspected before being put to use and at the beginning of each shift. • Faulty/unsafe equipment will be tagged and if possible locked out. • Drill rigs and geoprobes shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.
	Heat rash	<ul style="list-style-type: none"> • Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Comply with IT Procedure HS 400 (May 13, 1999). • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none"> • Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Comply with IT Procedure HS 400 (May 13, 1999). • Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the "buddy system." • Comply with IT Procedure HS 400 (May 13, 1999). • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices. • Comply with IT Procedure HS 400 (May 13, 1999).
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"> • Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. • All mobile equipment and areas in which they are operated shall be adequately illuminated. • Aboveground and belowground utilities will be located prior to staging equipment. • Whenever the equipment is parked, the parking brake shall be properly set. • Equipment parked on inclines will have the wheels chocked. • Inspect brakes and tire pressure on drill rig and support equipment before staging for work.
	Inexperienced operator	<ul style="list-style-type: none"> • Machinery and mechanized equipment shall be operated only by designated qualified personnel. • Operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgment.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 9 of 12)

Activity	Potential Hazards	Recommended Controls
Installation of Monitoring Wells (continued)	Jacks/outriggers	<ul style="list-style-type: none"> • Ensure proper footing and cribbing.
	Falling objects	<ul style="list-style-type: none"> • Remove unsecured tools and materials before raising or lowering the derrick. • Stay alert and clear of materials suspended overhead.
	Pinch points	<ul style="list-style-type: none"> • Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert at all times!
	Fire	<ul style="list-style-type: none"> • Mechanized equipment shall be shut down prior to and during fueling operations. • Have fire extinguishers inspected and readily available. • Obtain a Hot Work Permit, per IT Procedure HS 314 (April 25, 2002) for any operation which could act as an ignition source.
	Fall hazards	<ul style="list-style-type: none"> • Personnel are not allowed to work off of machinery or use them as ladders. • Use fall protection when working above 6 feet.
	Noise	<ul style="list-style-type: none"> • Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine parts	<ul style="list-style-type: none"> • Use machine guards; use long-handled shovels to remove auger cuttings, rotating augers shall be guarded per EM-385 1-1 16.09.L • Utilize safe lockout procedures for maintenance work.
	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Practice good housekeeping, keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> • Real time air monitoring will take place. Proper personal protective clothing and equipment will be utilized. • Stop immediately at any sign of obstruction. • Do not breathe air surrounding boring any more than necessary. • Upgrade to respirator if necessary. • Avoid skin contact with soil cuttings. Wear gloves. • Stay clear of moving parts of drill rig and geoprobe.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 10 of 12)

Activity	Potential Hazards	Recommended Controls
Installation of Monitoring Wells (continued)	Drum handling	<ul style="list-style-type: none"> • Be careful not to breathe air from around open drum any more than necessary. Monitor with photoionization detector/flame ionization detector (PID/FID) equipment and upgrade to respirator if necessary. • When filling a drum (with either soil or water), be careful not to make contact with the contained waste. Wear appropriate gloves. Make sure lid or bung of drum is secure. • If moving a drum unassisted, be sure to leverage properly, use proper lifting techniques, and wear safety glasses and steel-toed boots. • When using a drum dolly, make sure straps and lid catch are securely attached. Leverage properly when tilting drum. Be sure toes stay away from drum.
	UXO	<ul style="list-style-type: none"> • UXO specialist will perform UXO surface avoidance and/or UXO downhole avoidance.
Moving and shipping collected samples	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	<ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	<ul style="list-style-type: none"> • Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	<ul style="list-style-type: none"> • Label all containers as to contents and associated hazards.
	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60pounds require assistance or mechanical equipment; size-up the lift.
Material storage	Flammable and combustible liquids	<ul style="list-style-type: none"> • Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.

Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 11 of 12)

Activity	Potential Hazards	Recommended Controls
Disposal of investigation-derived waste (IDW) (Forklift Operation) (continued)	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection.
High-pressure water jetting operations	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.
	Fueling	<ul style="list-style-type: none"> • Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	<ul style="list-style-type: none"> • Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	<ul style="list-style-type: none"> • Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	<ul style="list-style-type: none"> • Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.

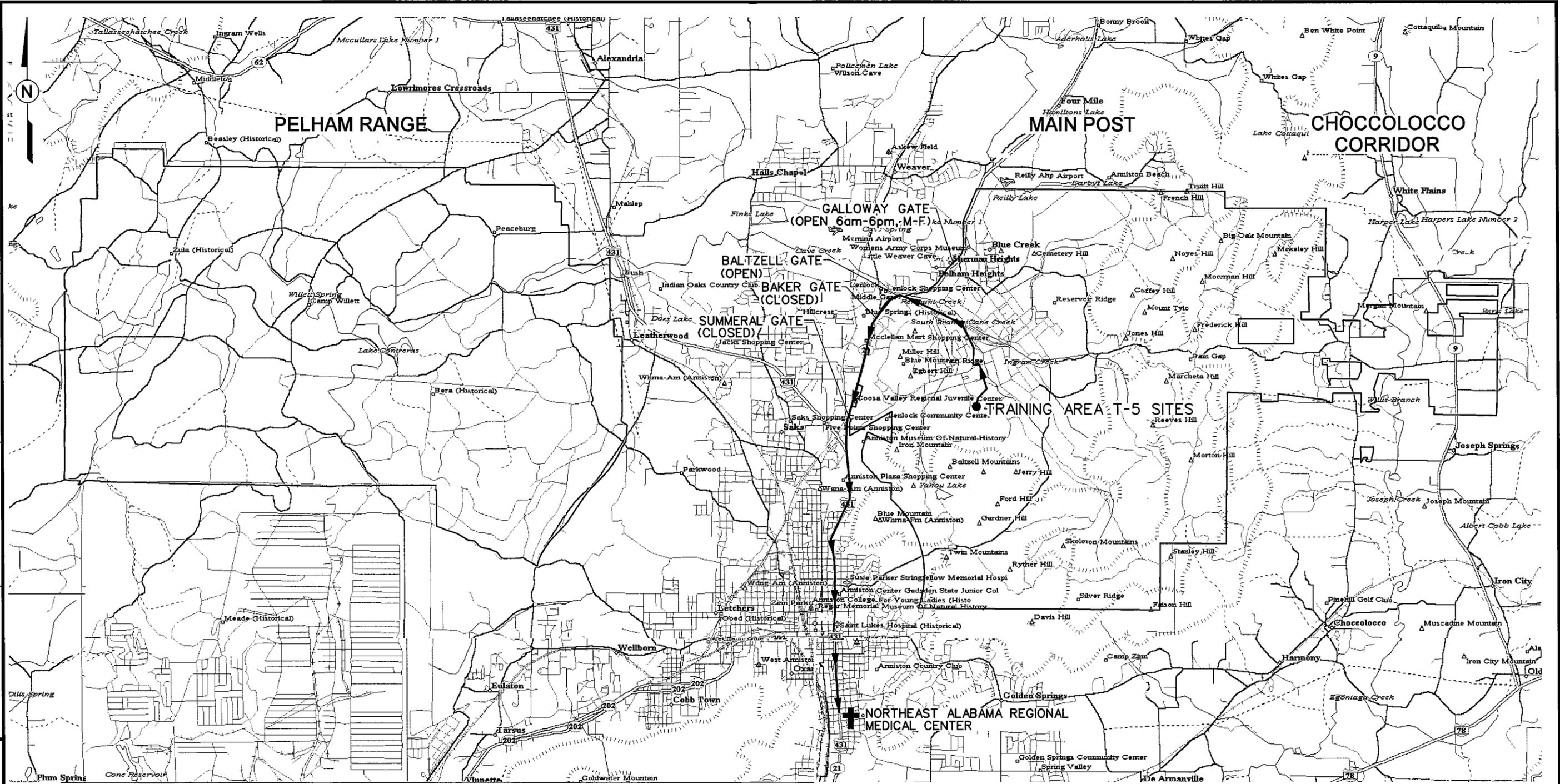
Table 5-1

**Activity Hazard Analysis
Training Area T-5 Sites
Fort McClellan, Calhoun County, Alabama**

(Page 12 of 12)

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	Out of control equipment	<ul style="list-style-type: none"> • No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	<ul style="list-style-type: none"> • All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	<ul style="list-style-type: none"> • Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended
	Falling objects	<ul style="list-style-type: none"> • Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead.
	Flying debris	<ul style="list-style-type: none"> • Impact-resistant safety glasses with side shields are required.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> • All site personnel will wear the appropriate PPE.

INITIATOR: J. RAGSDALE DWG. NO.: \838936ES.011
 PROJ. MGR.: J. YACOUB PROJ. NO.: 838936
 DRAFT. CHK. BY: ENGR. CHK. BY: S. MORAN
 STARTING DATE: 09/24/02 DATE LAST REV.: DRAWN BY:
 09/24/02 10:56:40 AM DRAWN BY: D. BOWAR

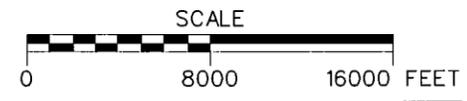


LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- HOSPITALS
- INVESTIGATION SITE

DRIVING DIRECTIONS FROM BALTZELL GATE ROAD TO THE NORTHEAST ALABAMA MEDICAL CENTER

- LEAVING FORT McCLELLAN ON BALTZELL GATE ROAD, TURN LEFT (SOUTH) ONTO AL HWY 21
- GO ~ 2.5 MILES WHERE AL HWY 21 MERGES WITH U.S. HWY 431 AND CONTINUE SOUTH
- CONTINUE SOUTH ON AL21/US431 FOR ~ 2.7 MILES
- TURN LEFT ONTO EAST 10th STREET
- GO ~ 0.2 MILE TO MEDICAL CENTER ON RIGHT
- NORTHEAST ALABAMA REGIONAL MEDICAL CENTER, 400 EAST 10th STREET
- PHONE NUMBER : (256) 235-5121



**FIGURE 5-1
 HOSPITAL EMERGENCY ROUTE**

U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018



ATTACHMENT 1

**EVALUATING OE/UXO/CWM HAZARDS
IN SUPPORT OF HTRW ACTIVITIES**

Site Name: Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7)

Job Number: 838936

Date: 09/16/02

Name of person completing form: John Ragsdale

Title: Plan Writer

Signature: _____

1a. Have the historical records available for this HTRW site been reviewed? Yes No

If the answer to **1a.** is yes, proceed to **1b.**
 If the answer to **1a.** is no, review site information prior to completing this form.

1b. Is there recent information (site walk, worker interviews, etc.) that indicates a potential OE/CWM hazard at this site? Yes No

Proceed to **2.**

2. According to the records review, is this site known or suspected to have been used for:

	Yes	No
2a. Manufacturing, production, or shipping of conventional or chemical warfare materiel (CWM) OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Live fire testing of any ordnance:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Conventional or CWM OE training:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Storage of conventional or CWM OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disposal or demilitarization of conventional or CWM OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other (specify):		

	Yes	No
2b. Manufacturing, production, or shipping of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Research or testing of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Chemical agent related training:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Storage of chemical agent:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disposal or demilitarization of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other (specify):		

Any **2a** question answered "YES" indicates UXO support is required for all site activities. If all **2a** questions are answered "NO", UXO support may not be required. Refer to Installation-Wide Safety and Health Plan (SHP) for additional information concerning UXO support. Proceed to question **2b.**

Any **2b** question answered "YES" requires the remainder of this form to be completed. If all **2b** questions are answered "NO", real-time monitoring for chemical agent will not be required and completing the remainder of this form is not required. Refer to SHP for additional information concerning agent monitoring.

Additional space for notes and explanations on page 4.
 Continue to page 2 of 4 –

Evaluating OE/UXO/CWM Hazards in Support of HTRW Activities

Site Name: Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7)

Job Number: 838936

Date: 09/16/02

3. For sites where the manufacturing, testing, storage, or disposal of CWM is suspected:	Yes	No
Is there evidence that the CWM is/was containerized in potentially unexploded ordnance:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there evidence that the CWM is/was containerized in nonexplosive containers:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is there evidence that the CWM is open to the environment (i.e., in an open container or free liquid/solid in the soil/water):	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is there evidence that the CWM hazard has been removed from the site or that the site has been decontaminated:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Has the site been previously monitored or sampled for chemical agent or agent breakdown products:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
For any "YES" above, was the agent or breakdown product identified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

For any "Yes", list types of agent (mustard, lewisite, etc.) and the form (in ordnance, in drum, etc.) the CWM is expected to be found (or state "unknown"):

List agent breakdown products identified:

None identified in Parsons EE/CA.

4. Defining the Potential for the Presence of CWM:	Agent Monitoring Requirements for Site Activities:
4a. High Presence Potential – Definition: CWM is known or highly suspected to be present at the site in a condition (within ordnance and/or nonexplosive container, or in an uncontainerized form in sufficient volume that weathering of the product has not rendered it harmless) that will cause potential harm to personnel if it is encountered.	Mandatory personal and perimeter air monitoring using the DAAMS, MINICAMS, and RTAP collection/analysis methods with off-site surety laboratory confirmation of all environmental samples. Specific monitoring criteria (equipment types and sampling station placement, percentage of personnel monitored, etc.) to be established in the Site Specific Safety and Health Plan (SSHP).
4b. Moderate Presence Potential - Definition: CWM is suspected to have been present at the site, but has been previously removed and/or decontaminated, or has been open to the environment such that it is expected to have degraded and been rendered harmless.	The need for personal and perimeter air monitoring using the DAAMS, MINICAMS, and RTAP collection/analysis methods with off-site surety laboratory confirmation of all environmental samples will be reviewed on a site-by-site basis. Specific monitoring criteria (equipment types and sampling station placement, percentage of personnel monitored, etc.) to be established in the Site Specific Safety and Health Plan (SSHP).
4c. Low Presence Potential – Definition: No indications that CWM will be present in quantity or reactivity (in munitions, projectiles, drums, etc.).	No specific personal or area monitoring for chemical agents required beyond what is specified in the SHP.

Continue to page 3 of 4 -

Site Name: Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7)

Job Number: 838936

Date: 09/16/02

Based on the information available for this site, including information gathered during completion of this form, the potential for CWM to be present at this site, as defined above, is expected to be: **LOW**

Exceptions/Explanations: See Attached memorandum from the Department of the Army (additional space for notes and explanations on page 4)

5. Based on the information provided in questions 1 through 5, above, the following guidelines will be used for establishing PPE requirements for activities to be performed at this site; Specific details are provided in the SSHP:

5a. High Exposure Potential - High exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, PPE for all personnel in the exclusion zone at a site identified as having a "High Exposure Potential" will be Level B (supplied air) or Level C (full-face respirator with HEPA/Acid Gas/OV cartridges w/ emergency egress hood) and chemically resistant coveralls. Specific PPE requirements are in the SSHP for this site.

5b. Moderate Exposure Potential - Moderate exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, PPE for all personnel in the exclusion zone at a site identified as having a "Moderate Exposure Potential" will be Modified Level D (disposable coveralls and emergency egress hood) carried by all personnel. Specific PPE requirements are in the SSHP for this site.

5c. Low Exposure Potential - Low exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, no additional PPE requirements above those stated in the SSHP are needed for sites identified as having "Low Exposure Potential." Specific PPE requirements are in the SSHP for this site.

Based on all available information, the exposure potential at this site is considered to be: **LOW**

Exceptions/Explanations: See attached memorandum from the Department of the Army.

Review Signatures:

IT UXO Technical Manager



Date: 26 SEP 02

IT H&S Specialist



Date: 9/30/02

Site Name: Training Area T-5 Sites, Parcels 180(7), 182(7), 511(7), 512(7), 513(7), 514(7), and 516(7)

Job Number: 838936

Date: 09/16/02

Additional Notes and Explanations:

Former Detection and Identification Area, Parcel 180(7). The site was used from some time in the 1950s until 1972 for training in the detection and identification of CWM. The CWM used at this location may include simulants, HD, GB, carbonyl chloride, cyanogen chloride, dichloroformoxime, hydrogen cyanide, STB, and DS2. Portions of this area are currently fenced and posted. Some sources indicate that only simulants were used at this location, while others recall that dilute CWM-containing mixtures were used to train troops.

Training Area T-5, Parcel 182(7). Training Area T-5, Parcel 182(7), was reportedly used from 1961 to 1973 and reportedly involved detection and decontamination of CWM, including HD, nerve agent O-ethyl-S-(diisopropylaminoethyl)-methylphosphonothiolate (VX), and GB. The decontaminant chemicals STB and DS2 were probably also used here. Personnel interviewed report that explosive ordnance disposal personnel formerly conducted "render-safe" exercises on munitions (typically artillery shells) in this area (ESE, 1998). EOD personnel placed the munition on the ground and poured a vial of a specific live CWA over the munition. The EOD reaction team then identified the CWA, decontaminated the munition, and packed it for transport.

Blacktop Training Area, Parcel 511(7) and Fenced Yard in Blacktop Area, Parcel 512(7). The area is primarily an "asphalt parking lot" type area with viewing stands (bleachers) on both ends of the area, and an inner fenced-in portion. The fenced yard in the Blacktop Area is almost one-half acre in addition to the 3 acres in the Blacktop Area. Various demonstrations may have taken place here, such as decontamination training, but the exact use is unknown. The area was reportedly used for training in the use of flamethrowers, decontamination equipment, and smoke generators. The Fenced Yard, enclosed by the high fence, was believed to have been used to store agent or for toxic agent training.

Dog Training Area, Parcel 513(7) and Dog Kennel Area, Parcel 516(7). The site was used for training dogs for the U.S. Army Military Police School and remnants of the training obstacles were still in existence in September 1998. A large, blistered/corroded concrete pad which was surrounded by a high fence is located within the area and may have been used to store agents or to conduct toxic agent training in "Transfer Operations," since the Depot Area is across the road from this area. Both areas are approximately 1-acre sites.

Old Burn Pit, Parcel 514(7). Although nothing is known about the site and this area is not specifically listed as hosting chemical training, it appeared to be a burn pit and therefore was selected for further sampling to ensure that CWM was not present. The aerial photograph analysis does show a well defined cleared area in the 1961 aerial photograph that coincides with the location of the burn pit (Parsons, 1999). A site visit conducted in February 1999 by Parsons revealed the area behind the Motor Pool to be wooded, but the remains of the pit were still visible. The pit is covered over with a wire mesh and contains some remnant metallic objects within it.

Parsons conducted an engineering evaluation/cost analysis (EE/CA) investigation in 2001 on Main Post at Fort McClellan to address the potential presence of CWM or other subsurface disposal using geophysical surveys, excavation of suspect anomalies, continuous air monitoring, soil sampling, and laboratory analysis of the soils for GB, HD, VX and chemical agent breakdown products. The EE/CA investigation did not find any evidence of soil contamination by chemical agent. Based on the results of soil sampling and analysis, Parsons concluded that it could be inferred that current and future human health risks due to exposure to CWM at this site are very unlikely. A memorandum from the Department of Army providing release of properties on Main Post for hazardous, toxic and radiological waste (HTRW) investigations is attached.

**MEMORANDUM FOR RELEASE OF PROPERTY TO CONDUCT
HTRW INVESTIGATIONS**



DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

REPLY TO
ATTENTION OF:

September 7, 2001

Environmental and HTRW Section
Engineering Division

IT Corporation
Attention: Mr. Steve Moran
312 Directors Drive
Knoxville, Tennessee 37923-4799

Dear Mr. Moran:

Reference is made to your Contract DACA21-96-D-0018, Task Order CK10, WADs 1, 2, 9, and 10, at Fort McClellan, Alabama.

The Corps of Engineers Huntsville Center has completed its CWM EE/CA and has received all soil sample results. All of the samples were clear of Chemical Warfare Material and Chemical Warfare Material by-products. A copy of Huntsville's letter is enclosed for your files.

You are now authorized to begin the monitoring well installations within these areas as approved in your work plans.

Should you have any questions, please contact me at (334) 690-3077.

Sincerely,

Handwritten signature of Ellis C. Pope in cursive.

Ellis C. Pope
Authorized Representative of the
Contracting Officer

Encl

Cf: Mr. Ron Levy
BRAC Environmental Coordinator
U.S. Army Garrison/Transition Force
Environmental Office
291 Jimmy Parks Boulevard
Fort McClellan, AL 36205-5000



DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

REPLY TO
ATTENTION OF

CEHNC-OE-DC (200-1c)

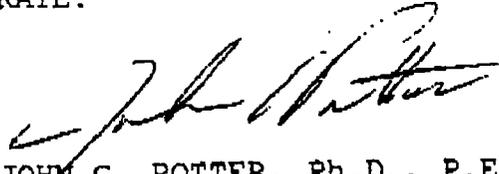
5 September 2001

MEMORANDUM FOR Commander, U.S. Army Engineer District, Mobile,
ATTN: Ellis Pope (EN-GE), P.O. Box 2288, Mobile, AL 36628-0001

SUBJECT: Chemical Warfare Material (CWM) Engineering
Evaluation/Cost Analysis (EE/CA) Completion and Release of
Property for Hazardous, Toxic, and Radioactive Waste (HTRW)
Investigations, Fort McClellan, AL

1. The CWM EE/CA for Fort McClellan has been completed and the results from all the soil samples have been received. All of the samples were clear of Chemical Warfare Material and Chemical Warfare Material by-products.
2. The HTRW investigations can be started on the Chemical Warfare Material Sites that were completed during this investigation using anomaly avoidance and withdrawal if suspect chemical weapons are found.
3. If you have any questions, please call Mr. Dan Copeland at 256-895-1567.

FOR THE DIRECTOR OF
ORDNANCE AND EXPLOSIVES DIRECTORATE:


JOHN C. POTTER, Ph.D., P.E.
Chief, Design Center
for Ordnance and Explosives
Directorate