Draft
Site-Specific Safety and Health Plan Attachment
Remedial Investigation at
Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q

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 CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887

February 2003

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.

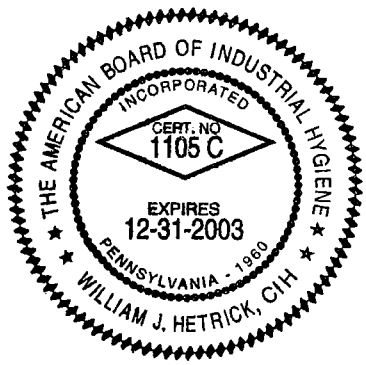
This site-specific safety and health plan (SSHP) must be used in conjunction with the installation-wide safety and health plan, and the installation-wide ordnance and explosives management plan, Fort McClellan, Alabama.

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 Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q, Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

02/27/03
Date



Bill Hetrick, CIH
Health & Safety Manager

2/27/03
Date

Jeff Tarr
Site Coordinator

2/27/03
Date

Acknowledgments

The final approved version of this site-specific safety and health plan (SSHP) attachment for the remedial investigation at the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q, 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: 2/27/03

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: 2/27/03

Site-Specific Safety and Health Plan
Acknowledgment Form

I have been informed of and will abide by the procedures set forth in this SSHP attachment for the remedial investigation at the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q, Fort McClellan, Calhoun County, Alabama.

Printed Name	***Signature***	***Representing***	***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	(865) 692-3571
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 U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the remedial investigation (RI) at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q, under Task Order CK10, Contract Number DACA21-96-D-0018. IT will conduct an RI to further determine the extent of contamination resulting from training activities that occurred at the site and to determine the most appropriate remedial actions potentially necessary. The data collected will also be utilized to evaluate the level of risk to human health and the environment posed by release of chemicals. The sample media, locations, and analytical parameters are identified in the site-specific field sampling plan (SFSP).

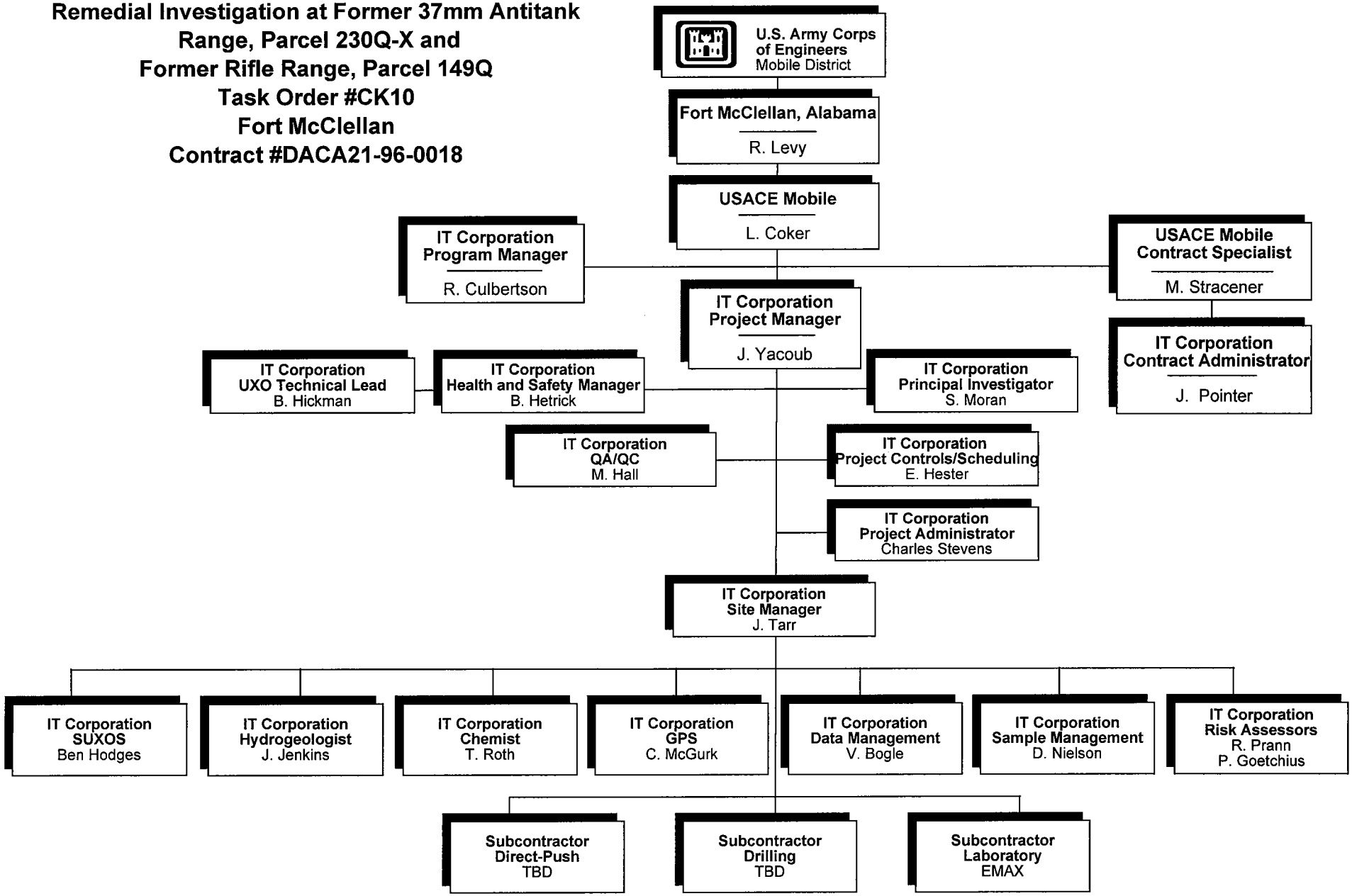
Project Tasks

- 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 and direct-push activities to determine the presence of potential downhole hazards.
- Conduct a five-phase investigation approach, including:
  - X-ray fluorescence (XRF) survey of surface soil to determine locations of soil borings and monitoring wells.
  - Install 20 soil borings to collect surface soil and subsurface soil samples (20 surface soil and 40 subsurface soil samples).
  - Install five residuum groundwater monitoring wells.
  - Collect eight groundwater samples from five proposed and three pre-existing monitoring wells.
  - Collect eight surface water and eight sediment samples.

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 (SHP) for site

Figure 1-1
Organization Chart
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Task Order #CK10
Fort McClellan
Contract #DACA21-96-0018



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investigations at FTMC and shall be familiar with the requirements of this site-specific safety and health plan (SSHP) and UXO safety plan attachment. This SSHP must be used in conjunction with the SHP for FTMC, Alabama.

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).

A former impact area is located within the study area and the surrounding parcels have been used as impact areas and the potential exists for UXO at the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q. Therefore, UXO surface sweeps and downhole surveys of soil borings and XRF screening locations will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance. The site-specific UXO safety plan attachment addresses the manner in which the avoidance will be conducted. In cases where the XRF sample location falls within an anomalous area, the XRF sampling point will be off set to a safe distance where hand tamping and compaction can be safely achieved.

Attachment 1, *Evaluating Ordnance and Explosives OE/UXO/CWM Hazards in Support of HTRW Activities*, has been prepared to identify additional ordnance and explosives (OE) site information specific to the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q. The evaluation has determined the potential for the presence and exposure to chemical warfare material (CWM) is low. Parcel 230Q-X and 149Q is not a suspect CWM site based on archive searches and site walks. According to Plate 8 (Chemical School Ranges and Training Areas) of the Archive Search Report (ASR), former Training Area 31 (Range AOC-1) occupies an area that overlaps Former 37mm Antitank Range. ASR records indicate that the study area was originally part of Range 30 and then used as Training Area T-31 beginning in 1967 (USACE, 2001). However, the environmental baseline survey compiled by ESE in 1998 indicates that only the northern portion of the Former 37mm Antitank Range was used for Training Area T-31 activities, while ASR Plate 8 indicates that the entire area was used.

Parsons conducted a chemical warfare materiel engineering evaluation/cost analysis (EE/CA) in 2001 that included Training Area T-31 (Parsons, 2002). The area of investigation for Training Area T-31 that was presented in the Parsons EE/CA report only bordered the area of

investigation for this RI for the Former 37mm Antitank Range, Parcel 230Q-X, and Former Rifle Range, Parcel 149Q. Therefore emergency escape/egress supplied air packs shall be used for intrusive activities (direct push sampling and monitoring well installation) since it is uncertain that the Parsons chemical warfare materiel EE/CA included the area of investigation in Parcel 230Q-X and Parcel 149Q.

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

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q. Contaminants of concern in site media are anticipated to be primarily metals.

Radiation hazards are not anticipated from previous site activities at the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q. However, the field screening to determine the horizontal extent of the presence of lead and copper in surface soil using the NITON XRF instrument requires general radiation awareness training. The XRF contains a cadmium $_{109}$, americium $_{241}$, and iron $_{55}$ sealed radioactive sources. Operators of the XRF shall be trained in the safe use of the instrument and follow all required manufacturers instructions. Leak detection testing within the last six months shall be performed on the XRF and certificates of analysis included in the shipping container. Required licensing documentation and storage requirements shall be enforced. Exposure to radiation is related to three factors: time, distance

Table 2-1

Toxicological Properties of Chemicals
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Arsenic [7440-38-2]	NA	NA	Inh Ing Con	Cough, diarrhea, shortness of breath, vomiting, grey skin. Redness	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.01 mg/m^3 0.01 mg/m^3	(Ca) 0.002 mg/m^3	PEL TLV REL	5 mg/m^3
Antimony [7440-36-0]	NA	NA	Inh Ing Con	Coughing, abdominal pain, burning sensation, vomiting, diarrhea,	Eye: Irrigate immediately Skin: Soap wash 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
Barium [7440-39-3]	NA	NA	Inh Ing Con	Cough, sore throat Redness	Eye: Irrigate immediately Skin: Soap wash 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	NA
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, substernal 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	

Table 2-1

Toxicological Properties of Chemicals
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
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	(10% LEL)
Lead {7439-92-1}	N/A	N/A	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.050 mg/m^3 0.050 mg/m^3 0.100 mg/m^3		PEL TLV REL	100 mg/m^3
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43–200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, 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 500 ppm	PEL TLV REL	2,000 ppm
Motor Oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
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	25ppm

Table 2-1

Toxicological Properties of Chemicals
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Nitroglycerin [55-63-0]	NA	NA	Inh Ing Con	Abdominal ramps, blue lips and fingernails, dizziness, headache, labored breathing	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.46 mg/m^3 skin	skin 2 mg/m^3 0.1 mg/m^3 skin	PEL TLV REL	75 mg/m^3
Portland cement [65997-15-1]	NA	NA	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	5 mg/m^3 respirable fraction 15 mg/m^3 total dust 10 mg/m^3 10 mg/m^3/ total dust		PEL TLV REL	5000 mg/m^3
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	2 mg/m^3 C 2 mg/m^3 C 2 mg/m^3		PEL TLV REL	10 mg/m^3

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = 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.
[d]STEL = 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.
[e]PEL = 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.
[f]IDLH (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, Pub. 1998).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.

Table 2-1

Toxicological Properties of Chemicals
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

? = Unknown.
LEL = Lower explosive limits.
LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, 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.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 6th ed., 1998.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, 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.

and shielding. Human exposure to radiation is typically measured in rems, or in one-thousandths of a rem, called millirems (mR). The allowable limit in the U.S. for occupational exposure is 5,000 mR/year for a whole-body and 50,000 mR for shallow penetration of extremities. Exposure from a properly-used NITON will be less than 50 mR per year, even if the instrument is used 2,000 hours per year.

2.2 General Site Information

Duration of Planned Employee Activity. Employee activity duration is anticipated to be one month.

Site Description and History. The Former 37mm Antitank Range, Parcel 230Q-X, and Former Rifle Range, Parcel 149Q, are located in the north-central area of the Main Post at FTMC, immediately north of the Ammunition Supply Point, Parcels 199(7) and 197(7), and west of the Chemical Defense Training Facility, Parcel 126Q-CWM. The area of investigation is limited to an approximately 25 acre area consisting of the firing line and impact area for Parcel 230Q-X. Parcel 230Q-X was identified as a 37mm Antitank Range from the 1946 Sanitary Sewage System map by Environmental Science and Engineering, Inc. (ESE) (ESE, 1998). The EBS reports that Former Rifle Range, Parcel 149Q, appeared on a 1959 historical range map and overlaps Parcel 230Q-X.

The parcel boundary for Former Rifle Range, Parcel 149Q overlaps the eastern portion of Former 37mm Antitank Range. The line of fire of the Former Rifle Range appears to be to the southeast. No information was available regarding this range, such as dates of use, types or ordnance used, or operation.

Initially, the area was constructed as a 37mm antitank range during World War II, with a direction of fire to the east (ESE, 1998). Originally, the 37mm Antitank Range was approximately 300 feet north to south and 1,200 feet in length east to west (approximately 9 acres). The range was equipped with a track system used to move targets. By 1958, the track had been removed and a new firing line had been established for the M-1 Rifle Transition Table, believed to be the Former Rifle Range, Parcel 149Q. By 1967, the range was closed and listed as T-31 (USACE, 2001). An impact area was noted by ESE at the east end of Parcel 230Q-X.

Plate 5 (World War II to 1950) of the Archive Search Report (USACE, 2001) identifies the Former 37mm Antitank Range (OA-04) as located immediately south of Rifle Range (OA-07). It falls within an unidentified range fan possibly intended to represent both Former 37mm

Antitank Range and Rifle Range (OA-07). According to the ASR, the Former 37mm Antitank Range (OA-04) was built during World War II and included a moving target on a track. By 1958, the track was removed and an M1 rifle range was established. By 1967, the rifle range was closed and the area was listed as Training Area T-31. The ASR states that Range 31 (OA-07) first appeared during World War II with the initial use unknown. By 1958, the range was used as a machine gun transition range. The 1967 range map lists chemical munitions as the range use. A variety of explosive devices were reportedly used such as 40mm grenade, Fougasse, smoke, flame throwers, light antitank weapons, and incendiary rockets, but no report of toxic chemicals being used.

IT personnel conducted site walks at Parcel 230Q-X and 149Q in December 2001. Two pop-up targets areas were found in the center portion of the area of investigation. The remnants of a platform located behind a berm were noted in the north-central portion of the parcel, and a steel pole with three pulleys was located behind a berm in the south-central portion. It is believed that these items were once part of a moving target system. Other surface features noted include: a shallow, east-west trending trench in the west-central portion of the area of investigation; a depression located approximately 1,200 feet downrange of the firing line for Parcel 230Q-X; and three downrange berms, one in the impact area noted by ESE. Several 35-gallon drums were located in the north-central portion of Parcel 230Q-X.

2.3 Pathways for Hazardous Substance Dispersion

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

Site Topography and Size. The elevation of the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q is approximately 850 to 875 feet above mean sea level. The area of investigation associated with this RI covers approximately 25 acres.

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 on surface and shallow subsurface sweeps	Level D
Surveying	Level D
Collecting surface soil, surface water and sediment samples	Level D **
Installing residuum monitoring wells and collection of groundwater and subsurface soil samples (DPT)	Modified Level D*
XRF Screening	Level D**
Equipment decontamination	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.

** Latex or Nitrile gloves required for field sampling and sample container handling.

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)
- Latex or Nitrile gloves for field sampling and sample container handling
- 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

- Nitrile, heavy work, or latex gloves

- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment)
- Supplied air emergency escape/egress packs (required for direct push and soil borings).

Note: In addition to modified Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the feet, 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 packs (required for direct push and soil borings).

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

4.0 Site Monitoring

The environmental contaminants of concern at the Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q are primarily metals and pesticides in surface soil, metals and trace explosives in groundwater, lead in sediment samples and metals in surface water samples. Table 4-1 contains action levels for site monitoring at the sites.

Chemical. Air monitoring will be performed by the site safety and health officer or qualified task geologist during the performance of ground-intrusive operations. A calibrated photoionization detector (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 breathing zones (BZ) 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 during residuum well installation to determine if any combustible/flammable oxygen levels may be present that would necessitate evacuation of the work area or suspending ignition source operations. If site conditions become dusty from vehicle and equipment operation a Miniram aerosol monitor will be utilized to measure respirable dust concentrations and quantify engineering control emission reduction due to lead being a contaminant of concern. Table 4-2 contains the air monitoring frequency and location for real-time air 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
Remedial Investigation at Former Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

When in Level C PPE

Analyte	Action Level[a]	Required Action
VOCs (volatile organic compounds)	≥ 25 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B; Notify CIH
Dust	> 2.5 mg/m^3 above background in BZ	Normal operations, initiate dust control to minimize migration.
LEL (lower explosive limit)	< 10 % LEL ≥ 10 % LEL	Normal operations Stop work, identify source

When in Level D Modified/D PPE

Analyte	Action Level	Required Action[b]
VOCs	≥ 2.5 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; Notify CIH
Dust	≥ 0.5 mg/m^3 above background in BZ	Stop work, Initiate dust control, upgrade to Level C PPE if dust control is not effective; Notify CIH
LEL (lower explosive limit)	< 10 % LEL ≥ 10 % LEL	Normal operations Stop work, identify source. Monitor for VOC's

Table 4-1

Action Levels
Remedial Investigation at Former Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

When in Support Zone

Analyte	Action Level	Required Action
VOCs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.
Dust	> 0.5 mg/m^3 above background in BZ	Stop work, Initiate dust control

[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
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Work Activity	Instrument	Frequency	Location
Staging equipment and UXO avoidance sweeps	OV Monitor Miniram	Initially for area As needed	Breathing zone (BZ) of employees
Sampling (surface water, surface soil, and sediment samples)	OV Monitor Miniram	Periodically As needed	BZ of employees BZ of employees
Monitoring well installation and subsurface soil sampling	OV Monitor Miniram LEL/ O_2	Periodically As needed Periodically	BZ of employees BZ of employees Bore hole
XRF Sampling	Miniram	Periodically	BZ of employees

OV = Organic vapor.
Miniram = Aerosol (respirable dust) monitor.
LEL/O_2 = Lower explosive limit/oxygen concentration.

5.0 Activity Hazard Analysis

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

- Staging equipment
- Land survey
- Surface/subsurface soil and groundwater sampling
- Installation of monitoring wells
- Moving and shipping collected samples
- Disposal of investigation-derived waste (IDW)
- High pressure water jetting.

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

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

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging	Slip, trip, and fall hazards	• 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	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	• Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	• Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	• Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	• Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hazard communication	• Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.
	Noise	• Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Cold stress	• 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	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Heat rash	• 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	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• 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.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	Contact with moving equipment/vehicles	• 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	• 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	• 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.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Extension cords	• 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	• 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. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	• 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.
Surveying	Slip, trip, and fall hazards	• 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.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	• 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.
	Wildlife hazards	• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	UXO	• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • If UXO is encountered, cease all activities, mark the location, and notify the site manager.

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Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Groundwater Sampling	Cross-contamination and contact with potentially contaminated materials	• 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. • 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	• Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	• MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.
	Strains/sprains	• Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	• Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (XRF)	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • 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	• Use care when handling glassware. • Wear adequate hand protection.
	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls.
	Bees, spiders, and snakes	• 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	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40°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.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (XRF) (continued)	Access/egress hazards	• 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	• 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	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• 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	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (XRF) (continued)	Lightning strikes	• 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.
	UXO	• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • If UXO is encountered, cease all activities, mark the location, and notify the site manager and UXO specialist.
Moving and Shipping Collected Samples	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	• Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	• Label all containers as to contents and associated hazards.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Material Storage	Flammable and combustible liquids	• 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	• 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.
	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • 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	• Use care when handling glassware. • Wear adequate hand protection.
High-Pressure Water Jetting Operations	Heavy lifting	• Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	• Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Fueling	• 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	• 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	• 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	• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	• 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	• Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	• 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	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended .
	Falling objects	• Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead.
	Flying debris	• Impact-resistant safety glasses with side shields are required.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Contact with potentially contaminated materials	• All site personnel will wear the appropriate PPE.
Drilling and Installation of Monitoring Wells	Overhead hazards	• Make sure no obstacles are within radius of boom. Always stay a safe distance from power lines.
	Faulty or damaged equipment being utilized to perform work	• 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 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.
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	• 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 set. • Equipment parked on inclines will have the wheels chocked. • Inspect brakes and tire pressure on drill rig before staging for work.
	Inexperienced operator	• Machinery and mechanized equipment shall be operated only be designated personnel. • Operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgment.
	Jacks/outriggers	• Ensure proper footing and cribbing.
	Falling objects	• Remove unsecured tools and materials before raising or lowering the derrick. • Stay alert and clear of materials suspended overhead.
	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert at all times!

Table 5-1

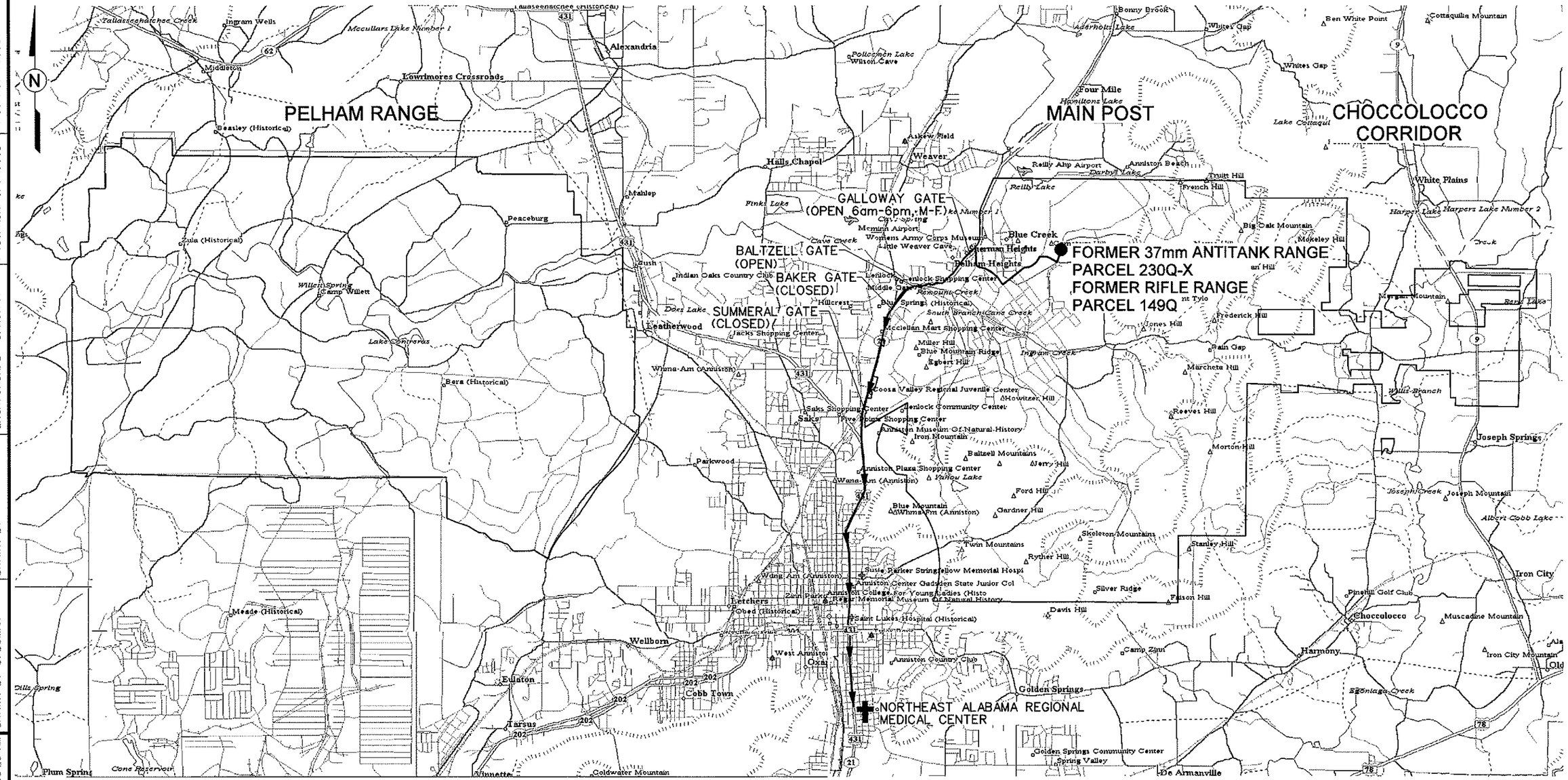
Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Drilling and Installation of Monitoring Wells (continued)	Fire	• Mechanized equipment shall be shut down prior to and during fueling operations. • Have fire extinguishers inspected and readily available.
	Fall hazards	• Personnel are not allowed to work off of machinery or use them as ladders. • Use fall protection when working above 6 feet.
	Contact with rotating or reciprocating machine parts	• Use machine guards; use long-handled shovels to remove auger cuttings. • Safe lockout procedures for maintenance work.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	• 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	• Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized. • Stop immediately at any sign of obstruction. • Do not breathe air surrounding the boring unless necessary. • Upgrade to respirator if necessary. • Avoid skin contact with soil cuttings. Wear gloves. • Stay clear of moving parts of drill rig.
	Drum handling	• Be careful not to breathe air from around open drum any more than necessary. Monitor with photoionizaton 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.

Table 5-1

Activity Hazard Analysis
Remedial Investigation at Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Drilling and Installation of Monitoring Wells (continued)	UXO	• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • UXO avoidance monitoring shall apply to all intrusive activities associated with well construction completion. • If UXO is encountered, cease all activities, mark the location, and notify the site manager and UXO specialist immediately.



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

SCALE
0 8000 16000 FEET

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

IT CORPORATION
A Member of The IT Group

DWG. NO.: ...\796887es.385
PROJ. NO.: 796887
INITIATOR: J. BROWN
PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY:
ENGR. CHCK. BY: S. MORAN
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 04/02/02
DRAWN BY: D. BOMAR
04/10/02 09:58:26 AM
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ATTACHMENT 1

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

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

Site Name: Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q

Job Number: 796887 **Date: 12/23/02**

Name of person completing form: John Ragsdale **Title: Plan Writer**

Signature: John Ragsdale

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

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.

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

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:	☐	☒
Live fire testing of any ordnance:	☒	☐
Conventional or CWM OE training:	☒	☐
Storage of conventional or CWM OE:	☐	☒
Disposal or demilitarization of conventional or CWM OE:	☐	☒
Other (specify):		

	Yes	No
2b. Manufacturing, production, or shipping of chemical agent:	☐	☒
Research or testing of chemical agent:	☐	☒
Chemical agent related training:	☒	☐
Storage of chemical agent:	☐	☒
Disposal or demilitarization of chemical agent:	☐	☒
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 –

Site Name: Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q

Job Number: 796887 **Date: 12/23/02**

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:	☐	☒
Is there evidence that the CWM is/was containerized in nonexplosive containers:	☐	☒
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):	☐	☒
Is there evidence that the CWM hazard has been removed from the site or that the site has been decontaminated:	☒	☐
Has the site been previously monitored or sampled for chemical agent or agent breakdown products:	☒	☐
For any "YES" above, was the agent or breakdown product identified?	☐	☒

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"):
The area of investigation for the Former 37mm Antitank Range, Parcel 230Q-X, and Former Rifle Range, Parcel 149Q bordered or may have overlapped the Training Area T-31 where CWM training was conducted (See Page 4 of 4). Parsons conducted a chemical warfare materiel engineering evaluation/cost analysis (EE/CA) in 2001 that included Training Area T-31 (Parsons, 2002). Parsons concluded from their investigation that exposure to chemical agents at the Training Area T-31 is unlikely because analysis of soil samples found no residual or degradation products. The Corps of Engineers Huntsville Center has authorized HTRW investigations for chemical warfare sites on the Main Post (See attached letter).

List agent breakdown products identified:

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: Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q

Job Number: 796887 **Date: 12/23/02**

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:)

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:

Review Signatures:

IT UXO Technical Manager _____ Date: 7JAN03 IT H&S Specialist _____ Date: 2/27/03

Site Name: Former 37mm Antitank Range, Parcel 230Q-X and Former Rifle Range, Parcel 149Q

Job Number: 796887 **Date: 12/23/02**

Additional Notes and Explanations:

The Former 37mm Antitank Range, Parcel 230Q-X, and Former Rifle Range, Parcel 149Q, are located in the north-central area of the Main Post at FTMC. The area of investigation is limited to an approximately 25 acre area consisting of the firing line and impact area for Parcel 230Q-X. Parcel 230Q-X was identified as a 37mm Antitank Range from the 1946 Sanitary Sewage System map by Environmental Science and Engineering, Inc. The parcel boundary for Former Rifle Range, Parcel 149Q overlaps the eastern portion of Former 37mm Antitank Range. The line of fire of the Former Rifle Range appears to be to the southeast. No information was available regarding this range, such as dates of use, types or ordnance used, or operation.

The area of investigation has had three documented uses since World War II. The area was constructed as a 37mm antitank range during World War II, with a direction of fire to the east. Originally, the 37mm Antitank Range was approximately 300 feet north to south and 1,200 feet in length east to west (approximately 9 acres). The range was equipped with a track system used to move targets. By 1958, the track had been removed and a new firing line had been established for the M-1 Rifle Transition Table, believed to be the Former Rifle Range, Parcel 149Q. By 1967, the range was closed and listed as T-31. A 1967 range map lists chemical munitions as the range use and lists a variety of explosive devices reportedly used such as 40mm grenade, Fougasse, smoke, flame throwers, light antitank weapons, and incendiary rockets, but no report of toxic chemicals being used.

According to Plate 8 (Chemical School Ranges and Training Areas) of the ASR, former Training Area T-31 occupied an area that overlaps Former 37mm Antitank Range. ASR records indicate that the study area was originally part of Range 30 and then used as Training Area T-31 beginning in 1967. However, the EBS compiled by ESE in 1998 indicates that only the northern portion of the Former 37mm Antitank Range was used for Training Area T-31 activities, while ASR Plate 8 indicates that the entire area was used. The area of investigation for this RI is the southern portion of Former 37mm Antitank Range

IT personnel conducted site walks in December 2001. In the center portion of the area of investigation are two pop-up target areas. The remnants of a platform located behind a berm were noted in the north-central portion of the parcel, and a steel pole with three pulleys was located behind a berm in the south-central portion. It is believed that these items were once part of a moving target system. Other surface features noted include: a shallow, east-west trending trench in the west-central portion of the area of investigation; a depression located approximately 1,200 feet downrange (Parcel 230Q-X); and three downrange berms, one in the impact area noted by ESE. Several 35-gallon drums were located in the north-central portion of Parcel 230Q-X.

Parsons conducted a chemical warfare materiel engineering evaluation/cost analysis (EE/CA) in 2001 that included Training Area T-31 (Parsons, 2002). The area of investigation for Training Area T-31 that was presented in the Parsons EE/CA report only bordered the area of investigation for this RI for the Former 37mm Antitank Range, Parcel 230Q-X, and Former Rifle Range, Parcel 149Q. Therefore, it may be unlikely that CWM training was conducted in the area of investigation for Former 37mm Antitank Range, Parcel 230Q-X, and Former Rifle Range, Parcel 149Q. In addition, Parsons concluded from their investigation that exposure to chemical agents at the Training Area T-31 is unlikely because analysis of soil samples found no residual or degradation products. The Corps of Engineers Huntsville Center has authorized HTRW investigations for chemical warfare sites on the Main Post which includes Training Area T-31 (See attached letter)

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,

Ellis C. Pope

Encl

Ellis C. Pope
Authorized Representative of the
Contracting Officer

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