

APPENDIX A

SITE-SPECIFIC SAFETY AND HEALTH PLAN

**Final
Appendix A
Site-Specific Safety and Health Plan for
Underground Storage Tank Removals and Closure Reports
Work Plan**

**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:

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312 Directors Drive
Knoxville, Tennessee 37923**

**Task Order CK08, Modification No. 2
Contract No. DACA21-96-D-0018
IT Project No. 783149**

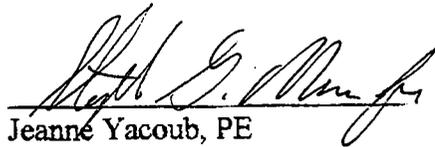
July 2000

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

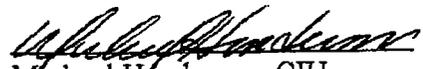
**Site-Specific Safety and Health Plan Approval
Fort McClellan, Calhoun County, Alabama**

I have read and approve this site-specific safety and health plan attachment for the Underground Storage Tank Removal at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.



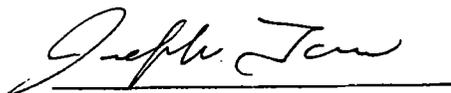
Jeanne Yacoub, PE
Project Manager

07/07/09
Date



Michael Henderson, CIH
Health & Safety Manager

7/7/2009
Date

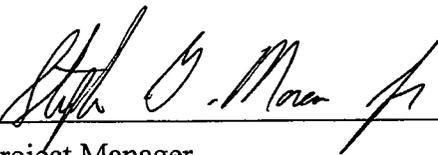


Jeff Tarr
Site Coordinator

7-7-09
Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) for the Underground Storage Tank Removal 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 6 months until project completion.



Project Manager

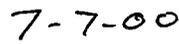


Date

I acknowledge receipt of this SSHP 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/or the health and safety manager.



Site Coordinator



Date

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
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Fort McClellan Project Emergency Contacts

Fire Department (on post).....	911
Fire Department (off post)	(256) 237-3541
Ambulance (off post)	911
Regional Medical Center	(256) 235-5121
Military Police (SSG Busch)	(256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton)	(256) 848-5680, 848-4732
Anniston Police Department	(256) 238-1800
Chemical Agent Emergencies	(256) 820-7272
(Hank Hubbard, Huntsville COE UXO EODT)	cell phone (205) 994-2254 or 994-2269
UXO Emergencies	(256) 820-7272
(Hank Hubbard, Huntsville COE UXO EODT)	cell phone (205) 994-2254 or 994-2269
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-3758
Baltzell Gate Guard Shack (Staffed 1600-0700 hours, Mon-Sun)	(256) 848-5693, 848-3821
National Response Center & Terrorist Hotline.....	(800) 424-8802
Poison Control Center.....	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers.....	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(770) 663-1429
Michael Henderson, IT H&S Manager	(865) 690-3211
Mike Moore, Fort McClellan Safety Officer	(256) 848-5433
Dr. Elaine Theriault, IT Occupational Physician.....	(800) 229-3674

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List of Acronyms

BDT	benzene detector tubes
BZ	breathing zone
FTMC	Fort McClellan
IT	IT Corporation
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
USACE	U.S. Army Corps of Engineers
UST	underground storage tank

1.0 Site Work Plan Summary

IT Corporation (IT), under contract to the U.S. Army Corps of Engineers, has prepared this Site-Specific Safety and Health Plan in accordance with the work plan for Task Order CK08, Modification No. 2 dated December 1999 for the removal of abandoned underground storage tanks (UST) and disposal of them in accordance with the current state and federal regulations at Fort McClellan (FTMC), Alabama.

Project Tasks

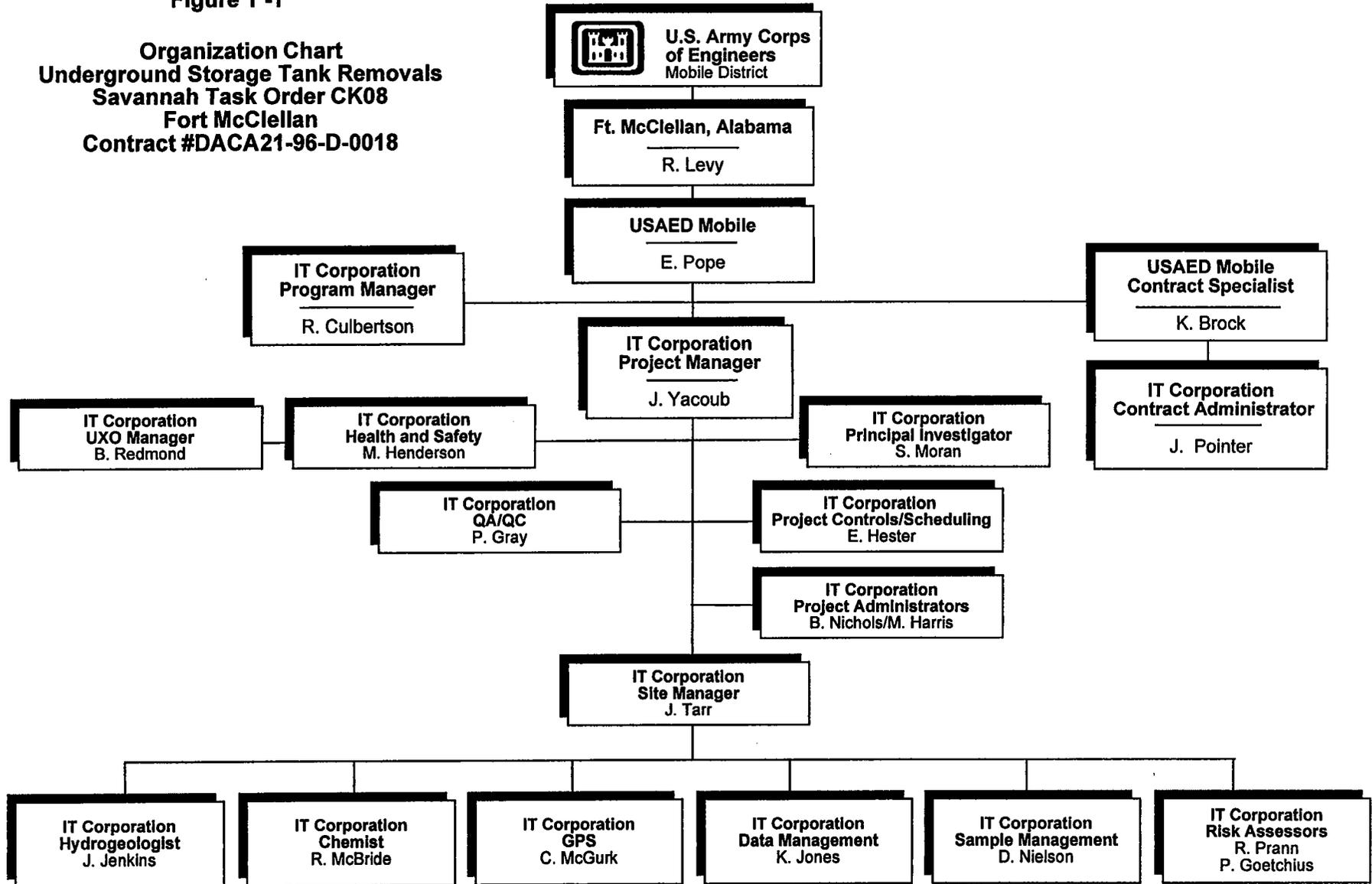
- Site preparation
- Removal and disposal of tank contents
- UST excavation and removal
- Confirmation and waste sampling
- Removal and disposal of contaminated soil
- Backfilling of excavations
- Site restoration.

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 investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, FTMC, Alabama.

Figure 1 -1

**Organization Chart
Underground Storage Tank Removals
Savannah Task Order CK08
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). Section 7.0 of the SHP details the use of the support zone, contamination reduction zone, and the exclusion zone that will be implemented to control the work area and reduce hazards.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used during UST removal activities. Contaminants of concern at the areas include benzene, ethyl benzene, toluene, xylene, gasoline, diesel fuel, and lead.

2.2 General UST Removal Practices

- Hazard Assessment

At the beginning of each tank removal and as often as necessary to ensure safety, the site safety and health officer (SSHO) shall conduct an area survey to locate workplace hazards and determine appropriate safety control measures.

- Excavation Safety

- All work involving excavation or trenching shall be subject to the requirements of HS307 (Excavation and Trenching) (Appendix A of this SSHP).
- Personnel entry into any excavation or trench that is more than 4-feet deep shall only be permitted if the excavation or trench is properly shored or sloped and safe for entry as determined by a qualified person.
- A daily inspection of an excavation shall be made by a competent person. If there is evidence of possible cave-ins or slides, all work in the excavation shall cease until the necessary safeguards have been taken.
- Trenches more than 4 feet shall have ladders or steps located so as to require no more than 25 feet of lateral travel between means of egress. Ladders shall be

Table 2-1

**Toxicological and Physical Properties of Chemicals
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 3)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Acetone [67-64-1]	9.7	13-100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritation of eyes, skin, nose, and respiratory system; giddiness, headache, nausea, fatigue, anorexia; dermatitis; bone marrow depression; human carcinogen.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	1 ppm 0.5 ppm 0.1 ppm	5 ppm 2.5 ppm 1 ppm	PEL TLV REL	Ca [500 ppm]
Ethyl benzene [100-41-4]	8.76	NA	Inh Ing Con	Irritation of eyes, skin, mucous membranes; headache; dermatitis; narcosis; coma.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention Aspirate: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm	REL TLV REL	800 ppm
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; broncho- pneumonia; 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 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, head- ache; 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	12,000 ppm

Table 2-1

**Toxicological and Physical Properties of Chemicals
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 3)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Sour ce ^e	IDLH (NIOSH) ^f
Lead [7439-92-1]	NA	NA	Inh Ing Con	Weak, insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	0.05 mg/m 0.05 mg/m 0.1 mg/m		PEL TLV REL	100 mg/m
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		500 ppm 500 ppm 500 ppm	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	100 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 10 mg/m ³ total dust 5 mg/m ³ respirable fraction	TLV PEL/ REL	
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m ³ 1 mg/m ³ 1 mg/m ³	3 mg/m ³	PEL TLV REL	80 mg/m ³
Toluene [108-88-3]	8.82	0.16-37	Inh Abs Ing Con	Irritation of eyes, nose; fatigue, weakness, confusion; euphoria; dilated pupils, nervousness, muscle fatigue, insomnia, paresthesia, dermatitis; liver and kidney damage.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	200 ppm 500 ppm (skin) 100 ppm	C 300 ppm 150 ppm	PEL TLV REL	500 ppm
Xylene o - [95-47-6] m - [108-38-3] p - [106-42-3]	8.56 8.56 8.44	20	Inh Abs Ing Con	Irritation of eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; cornea vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	150 ppm 150 ppm	PEL TLV REL	900 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals Underground Storage Tank Removals Fort McClellan, Calhoun County, Alabama

(Page 3 of 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.

¹IDLH (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.

? = 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).

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.

placed at an angle not more than 30 degrees from vertical and secured. Ladder side rails shall extend at least 3 feet above the original ground surface.

- All excavated soil shall be located at least two feet from the edge of the excavation to prevent soil from falling back into the excavation. No method that disturbs the soil in place (such as driving stakes) shall be used to contain soil material.
- All excavations shall be guarded on all sides by means of physical barricades. A minimum of 2 feet from edges will be maintained.
- All excavations shall be backfilled as soon as practical after work is completed and all associated equipment removed.
- Heavy Equipment Operation
 - Only experienced, proficient, equipment operators will be used to operate heavy equipment such as backhoes, front-end loaders, cranes, etc. Where certification or licensing requirements exist, such personnel shall possess appropriate certification and/or licensing for operating specified heavy equipment.
 - While operating heavy equipment in the work area, the equipment operator shall maintain communication with a designated signalman through either direct voice contact or approved, standard hand signals. In addition, all site personnel in the immediate work area shall be made aware of the equipment operations.
 - Materials, such as pipe, rebar, etc., shall be kept out of traffic lanes and access ways. Equipment shall be stored so as not to endanger personnel at any time.
 - A flagman with roadwork vest, signs, cones, and high-level warning signs shall be provided when it is necessary to control normal vehicular traffic due to vehicles such as end-dumps, entering or leaving the site.
- Fire Safety
 - Hot work shall not be conducted unless all requirements of HS314 (Hot Work in Hazardous Locations) (Appendix B of this SSHP) have been met.
 - Equipment on site shall be bonded and grounded, spark-proof, and explosion resistant, as appropriate. Particular attention to bonding/grounding shall be made during transfer of flammable/combustible liquids into vacuum trucks and when ventilation equipment is utilized.

- At least one fire extinguisher with a minimum rating of 20 A:B:C shall be strategically located in the area of active work.
- No smoking shall be allowed in the work area.
- The SSHO will issue hot work permits.
- Air Monitoring
 - Should chemical contaminants be present in air or surrounding soil, air monitoring for combustible or oxygen-deficient environments or specific toxic constituents shall be conducted by a qualified person.
 - Additional tests shall be selected and performed to the satisfaction of a qualified person based on the recommendations of the health and safety manager. All tests shall be repeated as often as necessary to assure safety since changing conditions may result in varying atmospheric contaminant concentrations.
 - All work activity is prohibited in atmospheres where tests indicate that the concentration of flammable vapors is greater than 10 percent of the lower explosive level or the concentration of oxygen is less than 20 percent or greater than 23 percent. Positive steps such as ventilation shall be taken to establish acceptable atmosphere conditions prior to resumption of operations.
 - Proper maintenance and operation of air monitoring equipment is an essential component of excavation operations. Use of combustible gas/oxygen indicators is subject to the following precautions:
 - Combustible gas indicators must be routinely and properly calibrated based on known mixtures of gas (i.e., pentane, methane) in air. Other combustible gases or vapors will read approximately correct in terms of explosivity but for maximum accuracy, a calibration curve for the specific substance or mixture of concern should be consulted.
 - Ambient oxygen concentrations of less than 10 percent will cause an inaccurately low reading on the combustible gas meter scale.
 - Carbon dioxide shortens the life of oxygen meter sensors. Use of an oxygen meter in atmospheres purged with carbon dioxide will have a cumulative effect; therefore, all such tests should be stopped as soon as a constant reading is obtained.

2.3 General Site Information

2.3.1 Site Descriptions

The following are the descriptions of each site where IT will investigate potential USTs; if USTs are found, IT will remove the USTs for disposal:

Parcel 16(7) - Former Gas Station, Building 1394, Former Motor Pool Area 1300, Parcel 148(7). The Former Motor Pool Area 1300, Parcel 148(7), is located northwest on Main Post. The site of Former Motor Pool Area 1300 is a rectangular plot bounded by 4th Street on the north, 3rd Avenue on the east, 9th Street on the south, and 4th Avenue on the west. Two 5,000-gallon tanks are reported to have been removed in 1991, but there are no closure reports on file.

Parcel 132(7) - Former Gas Station, Former Building 1594, Former Motor Pool Area 1500, Parcel 94(7). The Motor Pool Area 1500, Parcel 94(7) (also known as the Former Chemical Laundry) is located in the central part of the Main Post east of 5th Avenue and south of 22nd Street. The area was used as a site of a former vehicle maintenance facility (motor pool) and three gas stations were reported located at Motor Pool 1500 during World War II. Parcel 132(7) is recorded as a standard post gas station built in 1941. The original plans called for two 10,000-gallon USTs, one containing gasoline and the other diesel fuel. The foundations of the building and the former pump islands are still visible.

Parcel 133(7) - Former Gas Station, Former Building 1494, Former Motor Pool Area 1500, Parcel 94(7). A former gas station was located at Building 1494, which is located at Motor Pool Area 1500 (former Chemical Laundry). Records indicate that the standard post gas station was built in 1941. The original plans called for two 10,000-gallon USTs, one containing gasoline and the other diesel fuel. The foundations of the building and the former pump island are still present.

Parcel 134(7) - Former Gas Station, Former Building 1594A, Former Motor Pool Area 1500, Parcel 94(7). A former gas station was recorded as located at Building 1594A, which is located at former Motor Pool 1500 (former Chemical Laundry). Records indicate that the standard post gas station was built in 1941. The original plans called for two 10,000-gallon

USTs, one containing gasoline and the other diesel fuel. The foundations of the building and the former pump island are still present.

Parcel 135(7) - Former Gas Station, Former Building 594, Former Waste Chemical Storage Area, Parcel 87(7). The Former Waste Chemical Storage Area Site, Parcels 87(7) is the former location of Building 598. The site is located in the north central section of the Main Post. Second Street borders the site to the northeast. Cave Creek borders the site to the southeast and flows southwest past the site. The site is located next to the Alabama National Guard Area. This site was originally the location of a motor pool facility (Motor Pool 500) prior to its use as a storage area for waste chemicals. A former gas station was located at Building 594 at the Former Waste Chemical Storage Area (also recorded as Motor Pool 500). Records indicate that the standard post gas station was built in 1941. Reportedly, the station contained a single 10,000-gallon UST to store gasoline. The foundation of a building is still present.

Parcel 136(7) - Former Gas Station, Building 694, Former Motor Pool Area 600, Parcel 149(7). Former Motor Pool Area 600, Parcel 149(7), is an 8-acre rectangular parcel oriented northwest-southeast at 18th Street and 2nd Avenue. Currently, the wildlife management office and the offices of roads and grounds operations are located in Buildings 698 and 699. It is believed that motor vehicle maintenance was conducted at this site in the past; however, this activity is not currently being conducted in this area. A former gas station was located at Building 694 at Motor Pool Area 600; however, the building or the foundation does not exist. Records indicate that this was a former standard post gas station built in 1941. Reportedly, the station contained a single 10,000-gallon UST to store diesel fuel.

Parcel 137(7) - Former Gas Station, Building 2094, Former Motor Pool Area 2000, Parcel 144(7). The Former Motor Pool Area 2000 is located in the central part of Main Post at the intersection of 10th Avenue and 20th Street. The motor pool covers approximately 3.8 acres. The entire site is covered with asphalt, with the exception of the western boundary, which has grass. The only structures at the site are Building T-2098, located in the grass area in the western section of the site and a small shed located 60 feet north of Building T-2098. The area around the site consists of housing, recreational facilities, parking lots, and administrative buildings. The site was previously used as a go-cart racetrack. A former gas station was located at Building 2094 at the former Motor Pool Area 2000. Records indicate that it was the standard post gas station built in 1941. Reportedly, the station contained two 10,000-gallon USTs to store gasoline and diesel fuel. The foundation of the building is not present.

Parcel 140(7) - Former Gas Station, Building 1294, Former Decontamination Complex, Parcel 93(7). The Former Decontamination Complex, Parcel 93(7), is located north on Main Post on the corner of 4th Avenue and 1st Street. This site is also the location of Former Motor Pool Area 1200. The Former Decontamination Complex was built in 1941, and covers approximately 4 acres (including parking areas). The most of the area is fenced. A former gas station was reportedly located at former Building 1294 at the north end of the parcel. Records indicate that the standard post gas station was typical of those built in 1941. Reportedly, the station contained two 10,000-gallon USTs to store gasoline and diesel fuel. The foundation of the building is not present.

2.3.2 Duration of Planned Employee Activity

Employee activity duration is 6 months.

2.3.3 Pathways for Hazardous Substance Dispersion

Possible pathways for hazardous substances in the area are groundwater and soils.

3.0 Personal Protective Equipment

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

Task	Initial Level of PPE
Site preparation	Level D
Removal and disposal of tank contents	Modified Level D*
UST excavation and removal	Modified Level D*
Removal and disposal of contaminated soil	Modified Level D*
Confirmation and waste sampling	Modified Level D*
Backfilling of excavation	Level D
Site restoration	Level D

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

Level D. The minimal level of protection that will be required of IT 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 (Saran-coated tyvek where chemical agents are anticipated)
- 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).

Note: In addition to modified Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

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 respirators 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)

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from the UST removal activities are lead, gasoline, benzene, ethyl benzene, toluene, xylene, and diesel fuel. Table 4-1 contains action levels for site monitoring at the sites.

Chemical. Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated photoionization detector (i.e., Photovac 2020 or equivalent) organic vapor analyzer will be utilized to monitor the work areas 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. Benzene detector tubes (BDT) will be utilized to monitor the work areas and BZs to determine if benzene levels may be present that would necessitate upgrading of protection levels. Table 4-2 contains the air monitoring frequency and location for site monitoring at the work sites.

Table 4-1

**Action Levels
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level	Required Action ^a
Volatile Organic Hydrocarbons (VOH)	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B.
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.
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area.

When in Level D Modified/D PPE

Analyte	Action Level	Required Action ^b
VOHs	≥ 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.
Benzene	≥ 1 ppm in BZ	Upgrade to Level C PPE.

Table 4-1

**Action Levels
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 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
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Removal and disposal of tank contents	OV Monitor LEL/O ₂ Monitor BDT	Continuously Continuously As needed	Breathing zone (BZ) of employees and/or work area
UST excavation and removal; confirmation and waste sampling	OV Monitor LEL/O ₂ Monitor BDT	Continuously Continuously As needed	BZ of employees and/or work area
Removal and disposal of contaminated soil	OV Monitor LEL/O ₂ Monitor BDT	Continuously Continuously As needed	BZ of employees and/or work area

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

BDT = Benzene detector tube.

5.0 Activity Hazard Analysis

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

- Site preparation
- Surveying
- Removal and disposal of tank contents
- Stage equipment for pumping liquids
- Pumping liquids
- Material storage
- UST excavation and removal
- Removal and disposal of contaminated soil
- Confirmation and waste sampling
- High pressure water jetting operations
- Backfilling of excavations
- Site restoration.

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. Directions to the hospital are provided in Figure 1-2.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 17)

Activity	Potential Hazards	Recommended Controls
Site Preparation	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 eyewash 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. 	

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 17)

Activity	Potential Hazards	Recommended Controls
Site Preparation (continued)	Noise	<ul style="list-style-type: none"> • Sound levels above 85 decibels (dBA) mandates hearing protection.
	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 that has contacted poisonous plants. • Wash affected areas immediately with soap 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.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 17)

Activity	Potential Hazards	Recommended Controls
Site Preparation (continued)	Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	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.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 17)

Activity	Potential Hazards	Recommended Controls
Site Preparation (continued)	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 lying 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. • 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, 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.
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.
	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.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 17)

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	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.
	Biological hazards	<ul style="list-style-type: none"> • Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, and copperheads).
	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.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> • 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.
Removal of UST contents via explosion-proof pump	Contact with potentially contaminated materials	<ul style="list-style-type: none"> • Real-time monitoring will take place. Appropriate PPE will be utilized. • Good housekeeping will be stressed to safeguard against cross contamination of nearby areas and eliminate safety hazards. • The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 decibels (dBA) mandates hearing protection.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Good housekeeping. • Keep work area picked up and as clean as feasible. • Continually inspect the work areas for slip, trip and fall hazards.
	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!
	Strains/sprains	<ul style="list-style-type: none"> • Use the proper lifting techniques. • Lifts greater than 60 lbs require assistance or mechanical equipment. • Size up the lift.
	Cut hazards	<ul style="list-style-type: none"> • Wear adequate hand protection.
	Falling objects	<ul style="list-style-type: none"> • Remove unsecured tools and materials before operating equipment. • Stay clear of materials suspended overhead.
	Biological hazards – bees, spiders, and snakes	<ul style="list-style-type: none"> • Inspect the work area carefully and avoid placing hands and feet into concealed areas.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 17)

Activity	Potential Hazards	Recommended Controls
Removal of UST contents via explosion-proof pump (continued)	Working at elevated heights/falls	<ul style="list-style-type: none"> Personnel working at heights of 6 feet or more must be secured with fall protection.
	Fire	<ul style="list-style-type: none"> Real-time air monitoring will take place to determine oxygen and lower explosive limit. No smoking or open flames within 50 feet of the work area (work area will be posted). Fire extinguishes shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. All hoses, coupling, fixtures, etc., shall be properly bonded and grounded. IT Corporation's HS314 "Hot Work in Hazardous Locations (May 19, 1999)" policy and procedure shall be adhered to at all time.
	Electrical safety	<ul style="list-style-type: none"> Electrical equipment will be locked out and tagged.
	Staging equipment	<ul style="list-style-type: none"> Signal person will assist in positioning equipment.
	Uneven terrain and poor ground support	<ul style="list-style-type: none"> Inspections or determinations of road conditions and structure shall be made in advance to assure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.
	Hazard Communication	<ul style="list-style-type: none"> All containers shall be labeled as to contents and disposed of properly.
	Spills	<ul style="list-style-type: none"> Absorbent/neutralization material and 55 gallon drums will be kept available where leaks, spills, or ruptures may occur.
	Ladders	<ul style="list-style-type: none"> Ladder safety will be discussed at the Daily Tailgate Safety Meeting. Ladders will be inspected prior to each use. Faulty ladders will be tagged and taken out of service. Ladders will be secured by top, bottom, and intermediate fastenings as required. Personnel working at heights of 6 feet or more must be secured with fall protection.
	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.
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. 	

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 17)

Activity	Potential Hazards	Recommended Controls
Removal of UST contents via explosion-proof pump (continued)	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).
	Unattended worker	<ul style="list-style-type: none"> • "Buddy System" – visual contact will be maintained with personnel engaged in the transfer/removal of the tank contents.
	Lighting	<ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment.
Stage equipment for pumping liquids	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!
	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.
	Moving equipment	<ul style="list-style-type: none"> • Signal person will assist in positioning equipment.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> • Real-time air monitoring will take place. • Appropriate PPE protection will be utilized.
	Faulty equipment	<ul style="list-style-type: none"> • Equipment will be inspected prior to being placed into service and at the beginning of each shift. • Faulty/unsafe equipment will be tagged and if possible locked out.
Pumping liquids	Pressurized systems	<ul style="list-style-type: none"> • All discharge hoses and connections shall be routinely inspected.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 dBA mandate hearing protection.
	Fire	<ul style="list-style-type: none"> • A dry chemical fire extinguisher with a minimum UL rating of 5 A:B:C will be readily available.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

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Activity	Potential Hazards	Recommended Controls
Pumping liquids (continued)	Refueling	<ul style="list-style-type: none"> • Mechanized equipment shall be shut down prior to and during fueling operations. • Obtain a Hot Work Permit, per IT Procedure HS 314 (May 19, 1999) for any operation which could act as an ignition source. • Proper bonding and grounding. Only UL/FM approved safety cans will be used.
Excavation	Underground utilities	<ul style="list-style-type: none"> • All underground utilities will be located prior to excavating.
	Open excavations	<ul style="list-style-type: none"> • IT Policy and Procedure HS307 – “Excavation and Trenching” will be adhered to at all times.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> • Real-time air monitoring will take place. • Appropriate PPE protection will be utilized.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 dBA mandate hearing protection.
	Heavy equipment operations	<ul style="list-style-type: none"> • Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition. • 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. • Machinery and mechanized equipment shall be operated only by designated personnel. • Getting off or on any equipment while it is in motion is prohibited. • Machinery or equipment requiring an operator shall not be permitted shall not be 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. • All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. • All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair person. • Bulldozer and scraper blades end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use. • All self-propelled construction equipment shall be equipped with a back-arm alarm.
	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. 	

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 9 of 17)

Activity	Potential Hazards	Recommended Controls
Excavation (continued)	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).
	Fire	<ul style="list-style-type: none"> • Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 5 A:B:C. • 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 (May 19, 1999) for any operation which could act as an ignition source.
Removal of UST	Open trenches	<ul style="list-style-type: none"> • IT Policy and Procedure HS307 – “Excavation and Trenching” will be adhered to at all times.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> • Real-time monitoring will take place. Appropriate PPE will be utilized. • Good housekeeping will be stressed to safeguard against cross contamination of nearby areas and eliminate safety hazards. • All site personnel will practice good personal hygiene. • The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location. • Refer to SHSP for chemical hazard discussion.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 dBA mandate hearing protection.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Good housekeeping. • Keep work area picked up and as clean as feasible. • Continually inspect the work areas for slip, trip and fall hazards.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 10 of 17)

Activity	Potential Hazards	Recommended Controls
Removal of UST (continued)	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!
	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. • Mechanized equipment shall be shut down prior to and during fueling operations. • Obtain a Hot Work Permit, per IT Procedure HS 314 (May 19, 1999) for any operation which could act as an ignition source.
	Strains/sprains	<ul style="list-style-type: none"> • Use the proper lifting techniques. • Lifts greater than 60 lbs require assistance or mechanical equipment. • Size up the lift.
	Heavy equipment operations	<ul style="list-style-type: none"> • Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition. • 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. • Machinery and mechanized equipment shall be operated only by designated personnel. • Getting off or on any equipment while it is in motion is prohibited. • Machinery or equipment requiring an operator shall not be 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. • All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. • All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair person. • Bulldozer and scraper blades end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use. • All self-propelled construction equipment shall be equipped with a back-arm alarm.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

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Activity	Potential Hazards	Recommended Controls
Removal of UST (continued)	Ropes, slings, chains, and hooks	<ul style="list-style-type: none"> • The use of ropes, slings, and chains shall be in accordance with the safe recommendations of their manufacturer. • Rigging equipment shall not be loaded in excess of its recommended safe working load. • The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling. • Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service. • Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service. • Taglines shall be used to control the loads being handled by hoisting equipment. • All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
	Hoisting Equipment	<ul style="list-style-type: none"> • At no time shall the hoisting equipment be loaded in excess of the manufacturers rating. • While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground. • A standard signal system shall be used on all hoisting equipment.
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.
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.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 12 of 17)

Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations (continued)	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.
	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.
Confirmation Waste Sampling	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 soil. • Handle samples with care. • Only essential personnel will be in the work area. • 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.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 13 of 17)

Activity	Potential Hazards	Recommended Controls
Confirmation Waste Sampling (continued)	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 that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Access/egress hazards	<ul style="list-style-type: none"> • Utilize good housekeeping practices. • Keep aiseways, pathways, and work areas free of obstruction. • 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.
	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
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 14 of 17)

Activity	Potential Hazards	Recommended Controls
Confirmation Waste Sampling (continued)	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. • Keep all body parts in contact with the ground as close as possible. • 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.
Backfilling of Excavation	Open excavations	<ul style="list-style-type: none"> • IT Policy and Procedure HS307 – “Excavation and Trenching” will be adhered to at all times.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 dBA mandate hearing protection.
	Heavy equipment operations	<ul style="list-style-type: none"> • Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition. • 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. • Machinery and mechanized equipment shall be operated only by designated personnel. • Getting off or on any equipment while it is in motion is prohibited. • Machinery or equipment requiring an operator shall not be permitted shall not be 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. • All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. • All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair person. • Bulldozer and scraper blades end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use. • All self-propelled construction equipment shall be equipped with a back-arm alarm.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 15 of 17)

Activity	Potential Hazards	Recommended Controls
Backfilling of Excavation (continued)	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).
	Fire	<ul style="list-style-type: none"> • Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 5 A:B:C. • 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 (May 19, 1999) for any operation which could act as an ignition source.
Site Restoration	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 eyewash is in proper working condition.

Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 16 of 17)

Activity	Potential Hazards	Recommended Controls
Site Restoration (continued)	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.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	<ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> • 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	<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. 	

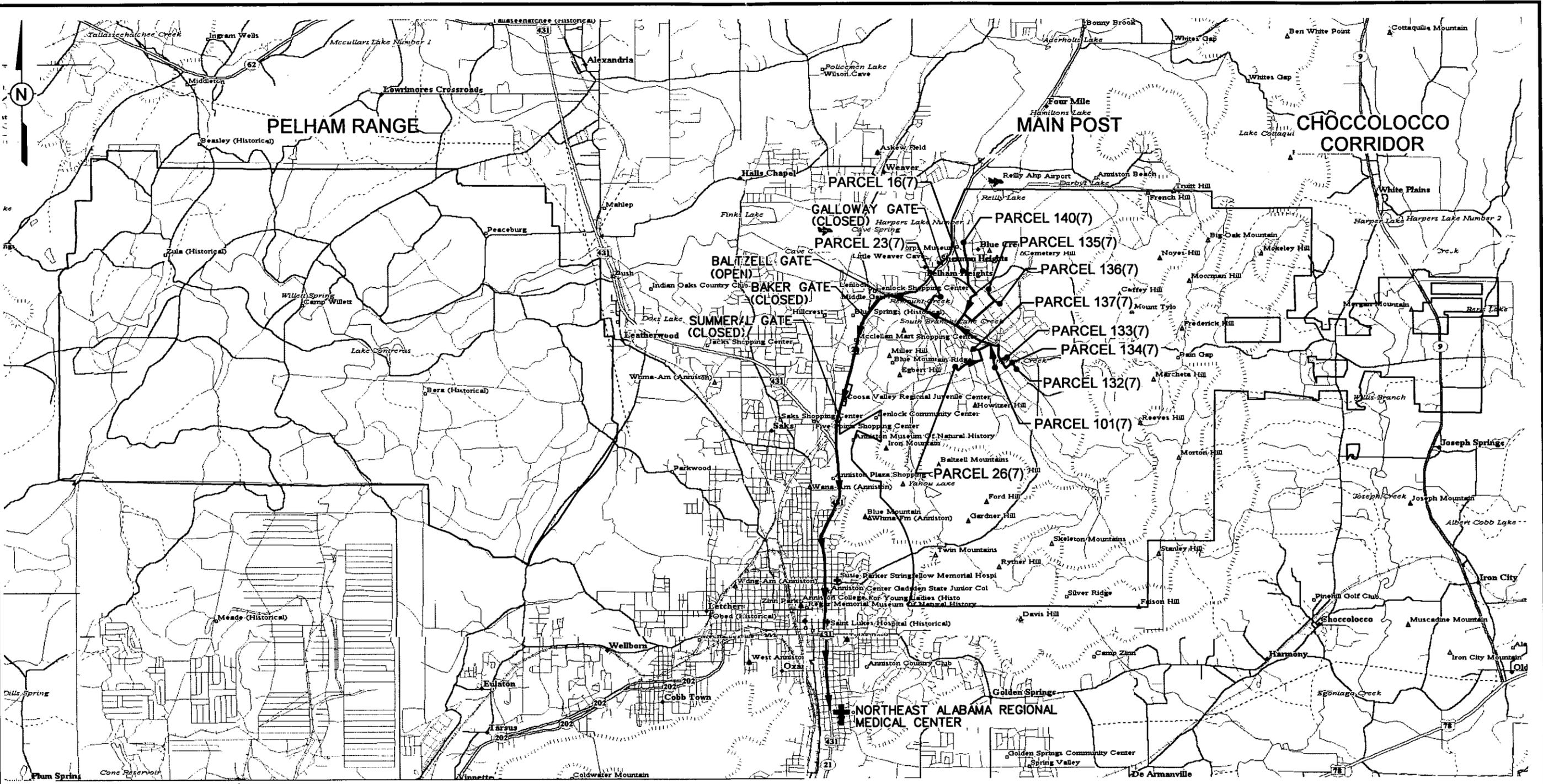
Table 5-1

**Activity Hazard Analysis
Underground Storage Tank Removals
Fort McClellan, Calhoun County, Alabama**

(Page 17 of 17)

Activity	Potential Hazards	Recommended Controls
Site Restoration (continued)	Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	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.
	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 lying 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. • 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, 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.

DWG. NO.: ...783149es.148
 PROJ. NO.: 783149
 INITIATOR: J. RAGSDALE
 PROJ. MGR.: J. YACOUB
 DRAFT. CHCK. BY: J. RAGSDALE
 ENCR. CHCK. BY: J. YACOUB
 STARTING DATE: 07/05/00
 DATE LAST REV.:
 DRAWN BY: A.W. SMITH
 01:55:25



LEGEND:

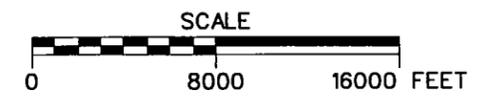
- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- HOSPITALS
- INVESTIGATION SITE

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 LEFT

**FIGURE 1-2
HOSPITAL EMERGENCY ROUTES**

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



APPENDIX A

IT PROCEDURE HS307, EXCAVATION AND TRENCHING



PROCEDURE

Subject: EXCAVATION AND TRENCHING

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to describe the company requirements for excavation and trenching safety. These requirements are based on the federal Occupational Safety and Health Administration (OSHA) excavation standard found in 29 Code of Federal Regulations (CFR) 1926, Subpart P.

Some company activities are likely to occur in states or localities that either currently have or will have requirements that differ from those contained within the federal standard. In such circumstances, the local health and safety representative will be responsible for ensuring that these requirements are included in either a site health and safety plan or a similar document and conveyed to all affected employees. If federal, state, or local regulations vary or conflict, the more protective requirements and practices will be followed.

2.0 TABLE OF CONTENTS

- 1.0 Purpose and Summary
- 2.0 Table of Contents
- 3.0 Responsibility Matrix
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- 4.0 Definitions
- 5.0 Text
 - 5.1 Pre-Excavation Requirements
 - 5.1.1 Underground Utilities
 - 5.1.2 Surface Encumbrances
 - 5.1.3 Vehicular Traffic
 - 5.1.4 Training
 - 5.2 Excavation Work Practices
 - 5.2.1 General
 - 5.2.2 Supervision
 - 5.2.3 Soil Classification
 - 5.2.4 Access and Egress
 - 5.2.5 Protective Systems
 - 5.2.6 Exposure to Falling Loads
 - 5.2.7 Warning System for Mobil Equipment
 - 5.2.8 Hazardous Atmospheres
 - 5.2.9 Water Accumulation Hazards
 - 5.2.10 Stability of Adjacent Structures
 - 5.2.11 Protection from Loose Rock or Soil



- 5.2.12 Inspections
- 5.2.13 Fall Protection
- 6.0 Exception Provisions
- 7.0 Cross Reference
- 8.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President of Health & Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.

4.0 DEFINITIONS

Accepted Engineering Practices

Those requirements or practices which are compatible with standards required by a registered professional engineer.

Angle of Repose

The greatest angle above the horizontal plane at which a material will lie without sliding.

Benching

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels of steps, usually with vertical or near-vertical surfaces between levels.

Competent Person

An employee who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees and who has the authority to take prompt corrective measures to eliminate them.

Company

All wholly-owned subsidiaries of the IT Group, Inc.

Excavation

Any man-made cut, cavity, trench or depression in an earth surface, including its sides, walls, or faces, formed by earth removal.

Registered Professional Engineer

An individual currently registered as a professional engineer (preferably civil) in the state where work is to be performed.

Sheeting



Members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield

A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields may be pre-manufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields".

Shoring

Structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sloping

A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Support System

A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated Data

Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench

A narrow (in relation to its length) excavation made below the surface of the ground. In general, the depth is greater than the width at the bottom, but the width of a trench at the bottom is not greater than 15 feet.

Type A Soil

Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, soil is NOT Type A if:

- The soil is fissured;
- The soil is subject to vibration from heavy traffic, pile driving, or similar effects;
- The soil has been previously disturbed;
- The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or

- The material is subjected to other factors that would require it to be classified as a less stable material.

Type B Soil

This classification refers to:

- Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa)
- Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and, in some cases, silty clay loam and sandy clay loam.
- Previously disturbed soils except those which would otherwise be classified Type C soil;
- Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subjected to vibration;
- Dry rock that is not stable; or
- Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C Soil

This classification refers to:

- Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less;
- Granular soils including gravel, sand, and loamy sand;
- Submerged soil or soil from which water is freely seeping;
- Submerged rock that is not stable; or
- Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

5.0 TEXT

5.1 Pre-Excavation Requirements

- 5.1.1 Underground Utilities.** Prior to opening an excavation, the estimated location of underground utilities such as sewer, telephone, fuel, electric, water, or any other underground installation that may be reasonably expected to be encountered during the excavation work shall be determined.



Utility companies or a utility location service shall be contacted within the established pre-notification time, advised of the proposed work, and asked to delineate the location of all underground utilities. Employees should be careful to protect and preserve the utility markings until they are no longer required for safe excavation. At least 3 feet of clearance between any underground utility and the cutting edge or point of powered excavation equipment will be maintained until the precise location of the utility is determined. Initial excavation within this 3 foot area will be conducted manually.

5.1.2 Surface Encumbrances. All surface encumbrances (trees, poles, boulders, etc.) that may create a hazard to employees shall be removed or supported.

5.1.3 Vehicular Traffic. Employees exposed to vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material. Traffic control devices (i.e., barricades, signs, cones, flagpersons, etc.) shall be specified and used in accordance with regulations applicable to the roadway or area in which excavation activities are occurring.

5.1.4 Training. Those who supervise the entry of personnel into an excavation must have completed a training course that included instruction in:

- Types of hazards associated with excavation operations;
- Safe work practices and techniques;
- A review of applicable Federal, state and local regulations; and
- A review of this procedure.

Employees who enter excavations are required to complete a site-specific training session to enable them to recognize unsafe conditions in and around the excavation. This training can be conducted during a tailgate safety meeting that emphasizes the specific excavation hazards that may be encountered.

Training documentation shall be maintained in the project file with a copy forwarded to the Knoxville Training Department.

As part of standard employee supervision process, training shall be complemented with on-the-job instruction and reinforcement of accepted practices to the extent necessary to assure compliance with this procedure and all other applicable regulations.



5.2 Excavation Work Practices

5.2.1 General. Each employee working within an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with 29 CFR 1926 Subpart P, except when the excavation is made entirely in stable rock or when the excavation is less than 5 feet deep and examination of the ground by a competent person provides no indication of a potential cave-in. A competent person shall ensure that protective systems, when required, are installed and maintained per the design specifications.

No employees shall be permitted to enter an excavation unless it is absolutely essential to do so and all requirements of this procedure are met.

5.2.2 Supervision. Work in an excavation shall at all times be supervised by a competent person. This individual will remain outside of the excavation at all times, and will be responsible for identifying any unusual developments above ground which may warn of impending earth movement.

5.2.3 Soil Classification. Based on the results of tests described in Attachment 3, the competent person will classify each soil/rock deposit as stable rock, Type A, Type B, or Type C. When layers of soil/rock exist, the weakest layer will be classified; however, each layer may be classified individually when a more stable layer lies under a less stable layer. If the properties or conditions of a soil/rock deposit change in any way, re-evaluation will be required.

5.2.4 Access and Egress. Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 or more feet in depth so as to require no more than 25 feet of lateral travel for employees.

5.2.5 Protective Systems. Protective systems shall be designed in accordance with 29 CFR 1926.652(b) or (c) and shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

5.2.6 Exposure to Falling Loads. No employees shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or



unloaded provided the vehicles are equipped with a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

5.2.7 Warning System for Mobil Equipment. When mobile equipment is operated adjacent to an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs.

5.2.8 Hazardous Atmospheres. Where an oxygen deficient (less than 19.5% O₂) or hazardous atmosphere exists, or could reasonably be expected to exist, the excavation shall be tested before employees enter. Testing shall be conducted as often as necessary to ensure that the atmosphere remains safe. Some excavations may be considered confined spaces which require compliance with IT Procedure HS300.

Adequate precautions shall be taken to prevent employee exposure to oxygen deficient or hazardous atmospheres. As appropriate, ventilation and/or respiratory protective devices shall be used.

5.2.9 Water Accumulation Hazards. Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. If water is controlled or prevented from accumulating by the use of water removal equipment, the process shall be monitored by a competent person to ensure proper operation.

If the excavation work interrupts the natural drainage of surface water (streams, run-off channels), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to run-off from heavy rains shall be regularly inspected by a competent person.

5.2.10 Stability of Adjacent Structures. Structures adjoining an excavation shall be evaluated to assess their stability. Excavation below the level of the base or footing of any foundation or retaining wall that could reasonably be expected to pose a hazard to employees shall only be permitted when:

- A support system (underpinning) is provided to ensure the safety of employees and the stability of the structure;
- The excavation is in stable rock;
- A registered professional engineer has determined that the structure will be unaffected by the excavation; or
- A registered professional engineer has determined that such excavation will not pose a hazard to employees.



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Sidewalks, pavements and other surface structures shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

5.2.11 Protection from Loose Rock or Soil. Employees shall be protected from loose rock or soil which could fall or roll from the excavation face or edge. Such protection could consist of scaling to remove loose materials, or the installation of protective barriers. All spoil shall be placed at least 2 feet from the edge of the excavation. It is strongly recommended that spoil be placed 4 or more feet from the excavation edge so as not to cover surface indicators of subsidence (such as fissures or cracks).

5.2.12 Inspections. The competent person shall make daily inspections of excavations, adjacent areas, and protective systems for evidence of conditions that could result in a cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. The inspection shall be made prior to start of work, and as needed throughout the shift. Inspections shall be made after each rainstorm or other hazard-increasing event and will be documented using Attachment (2).

Where the inspection finds evidence of any hazardous condition, exposed employees shall be immediately removed from the hazardous area until necessary precautions have been taken.

5.2.13 Fall Protection. Where employees or equipment are permitted to cross over excavations, walkways or bridges shall be provided. Standard guardrails shall be provided where walkways are 6 feet or more above lower levels.

Adequate barriers or other types of physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered and shall be backfilled as soon as possible.

6.0 EXCEPTION PROVISIONS

Variations and exceptions may be requested pursuant to the provisions of procedure HS013, Health and Safety Procedure Variations.



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7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variances
HS050 Training Requirements
HS051 Tailgate Safety Meetings
HS300 Confined Spaces
29 CFR 1926 Subpart P - Excavations

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Excavation Inspection
3. Soil Classification Worksheet
4. Selection of Protective Systems for Excavations 20 Feet or Less in Depth
5. Sloping Options
6. Shoring or Shielding Options



ATTACHMENT I
EXCAVATION AND TRENCHING

Responsibility Matrix

Action	Procedure Section	Responsible Party					
		Employee	Supervisor	Registered Professional Engineer	VP Health and Safety	Local H&S Representative	Competent Person
Incorporate state, local, or client-specific excavation requirements into project plans.	1.0					X	
Issue, revise, and maintain procedure	3.1				X		
Coordinate identification of underground utilities.	5.1.1		X				
Determine need for traffic control devices.	5.1.3		X				
Participate in excavation training.	5.1.4	X	X			X	X
Ensure that protective systems are installed and maintained.	5.2.1						X
Classify Soil Type	5.2.3						X
Design Structural Ramps	5.2.4						X
Selection and design of protective system(s)	5.2.5			X			
Determine stability of adjacent structures.	5.2.10			X			
Inspecting excavation for hazardous conditions	5.2.12	X	X				X



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**ATTACHMENT 2
 EXCAVATION INSPECTION**

**THIS INSPECTION IS TO BE COMPLETED BY THE COMPETENT PERSON
 EACH DAY THAT EMPLOYEES WILL BE ENTERING AN EXCAVATION.**

Project Name: _____ Project No.: _____
 Date: _____ Time: _____ Competent Person: _____
 Soil Classification (see Soil Classification Worksheet): _____
 Excavation Depth: _____ Excavation Width: _____
 Type of Protective System Used: _____

	✓		
	YES	NO	N/A
1. GENERAL:			
Surface encumbrances removed or supported			
Employees protected from loose rock or soil that could pose a hazard by falling or rolling into the excavation.			
Hard hats, steel-toed boots, and safety glasses worn by all employees.			
Spoils, materials, and equipment set back at least 2 feet from the edge of the excavation.			
Walkways over excavations 6 feet or more above lower levels are equipped with standard guardrails.			
Warning vest or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic.			
Employees required to stand away from vehicles being loaded or unloaded.			
Warning system established and utilized when mobile equipment is operating near excavation edge.			
Employees prohibited from going under suspended loads.			
2. UTILITIES:			
Utility companies contacted and/or utility locations delineated.			
Underground installations protected, supported, or removed while excavation is open.			
3. MEANS OF ACCESS AND EGRESS:			
Lateral travel to means of egress no greater than 25 feet in trench excavations 4 feet or more in depth.			
Ladders used in excavations secured and extended 3 feet above the edge of the trench.			
Structural ramps used by employees designed by a competent person.			
Structural ramps used for equipment designed by a registered professional engineer.			

These standard policies and procedures are applicable to all members of The IT Group, Inc., except where superseded or modified by the member Company.



	YES	NO	N/A
4. WET CONDITIONS:			
Precautions taken to protect from the accumulation of water.			
Water removal equipment monitored by a competent person.			
Surface water or runoff diverted or controlled to prevent accumulation in the excavation.			
Inspections made after every rainstorm or other hazard-increasing occurrence.			
5. HAZARDOUS ATMOSPHERE:			
Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficient, combustible, or otherwise hazardous atmosphere.			
Adequate precautions taken to protect employee from exposure to a hazardous atmosphere.			
Testing conducted to ensure that the atmosphere remains safe.			
Emergency equipment, such as breathing apparatus, safety harness and line, and basket stretcher readily available where hazardous atmosphere does exist.			
6. SUPPORT SYSTEMS:			
Materials and/or equipment for support systems selected based on soil analysis, trench depth, and expected loads.			
Materials and equipment used for protective systems inspected and in good condition.			
Damaged materials and equipment used for protective systems inspected by a Registered Professional Engineer after repairs and before being placed back into service.			
Protective systems installed without exposing employees to the hazards of cave-ins, collapses, or from being struck by materials or equipment.			
Members of support systems securely fastened to prevent failure.			
Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.			
Excavations below the level of the base or footings approved by a registered professional engineer.			
Removal of support systems progresses from the bottom, and members are released slowly as to note any indication of possible failure.			
Excavation of material to a level of greater than 2 feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth.			
Shield system placed to prevent lateral movement.			
Employees are prohibited from remaining in shield system during vertical movement.			
7. REMARKS:			
<hr/> <hr/>			



ATTACHMENT 3
SOILS CLASSIFICATION WORKSHEET

The following worksheet outlines the visual and manual tests that the competent person must perform at least once, and each time soil conditions change. At least one visual and one manual test must be performed; however, performing several tests is recommended so that the condition of the excavation is thoroughly examined.

Project Name: _____ Project Number: _____

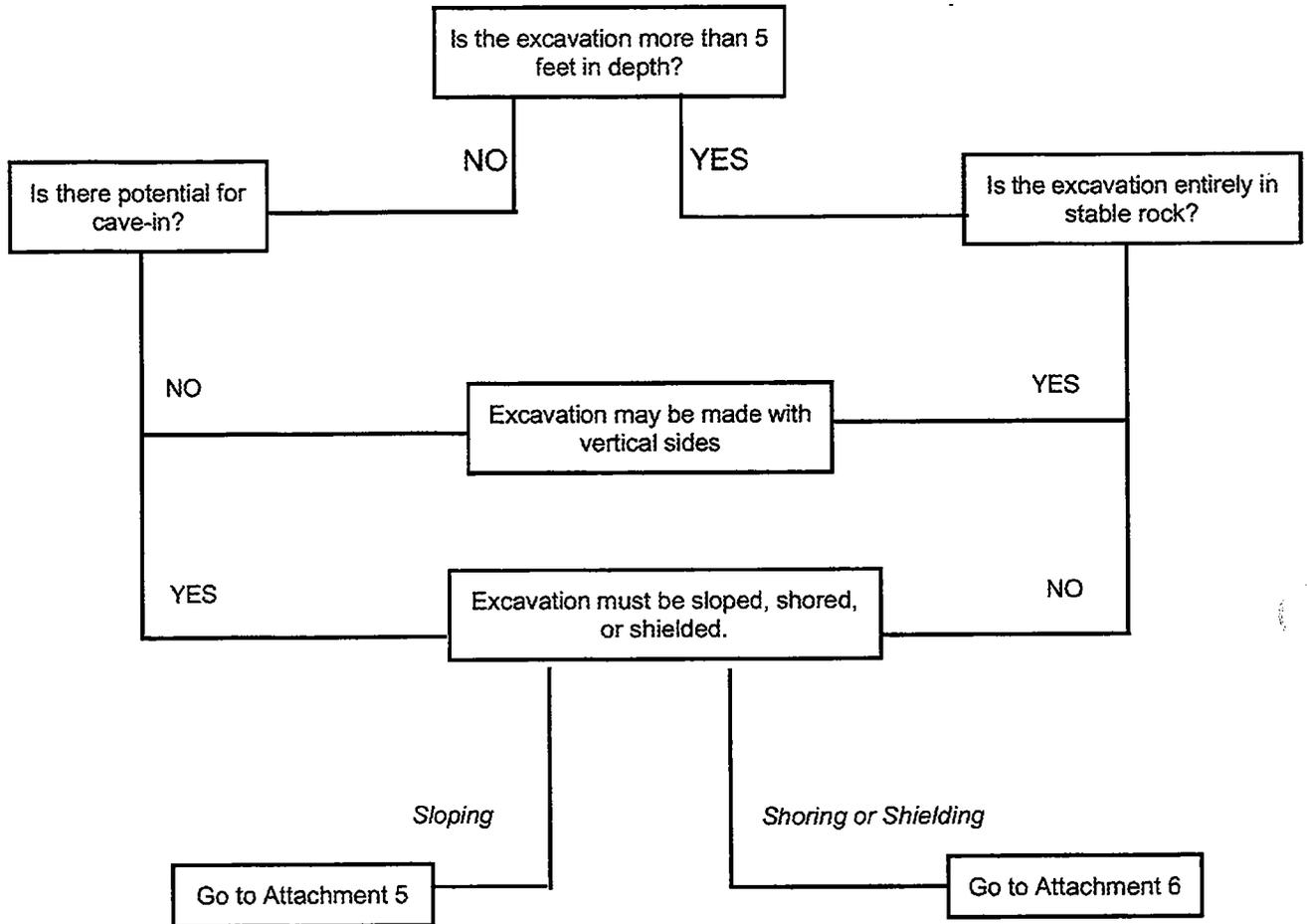
Date: _____ Time: _____

Where was the sample taken from? _____

I. VISUAL TESTS: One or more visual tests are required for each classification and each time conditions change.					
1. Estimate range of particle sizes:	a. primarily fine-grained = cohesive material b. primarily coarse-grained = granular material				
2. Observe excavated soil:	a. clumps = cohesive material b. breaks up easily = granular material				
3. Observe sides and adjacent surface area of opened excavation:	a. crack like openings = fissured material b. soil spalls off vertical sides = possible fissured material				
4. Previous excavation activities:	a. previously disturbed soil	b. not previously disturbed soil			
5. Observe opened side of excavation:	a. layered systems c. estimate degree of slope of layers:	b. layers sloped towards excavation _____			
6. Water condition:	a. evidence of surface water c. depth of water table :	b. water seeping from sides _____			
7. Vibration present:	a. area adjacent to excavation	b. area within excavation			
II. MANUAL TESTS- One or more manual tests are required for classification and each time soil conditions change.					
1. Plastically- soil is cohesive if following is true:	a. mold soil samples into a small ball b. roll ball into thread 1/8" diameter c. pick up 2" length of 1/8" thread by one end without breaking				
2. Dry Soil Strength:	a. crumbles on its own or with moderate pressure = granular b. falls into clumps which break into smaller clumps that are only broken with difficulty = clay with gravel, sand, or silt. c. breaks into clumps which do not break into smaller clumps and can only be broken with difficulty with no visual indication of fissures = unfissured.				
3. Thumb penetration test: (These tests are to be run on a large clump of material as soon as it is excavated.)	a. can be easily indented by the thumb but penetrated by thumb only with great effort = Type A b. easily penetrated several inches by thumb and molded by light finger pressure = Type C				
4. Unconfined Compressive Strength: (Saturated Soil Needed)	a. Pocket Penetrometer reading (take 10 readings and average) 0 - 0.5 = Type C, 0.5 - 1.5 = Type B, 1.5 - 2.0 = Type A b. Shear Vane reading X2: 0 - 0.5 = Type C, 0.5 - 1.5 = Type B, 1.5 - 2.0 = Type A				
5. Drying Test: (A dry soil sample 1" thick X 6' diameter is needed)	a. develops cracks = fissured material b. dries without cracks and breaks by hand with considerable force significant cohesive content = unfissured cohesive material. c. sample breaks easily by hand = fissured cohesive or granular material d. easily pulverize dry clumps by hand or by stepping on them = granular e. don't pulverize easily = fissured cohesive.				
SOIL CLASSIFICATION:	Type A	Type B	Type C	Stable Rock	Other _____
COMPETENT PERSON:	_____		_____	_____	_____
	Print Name	Signature	Date		



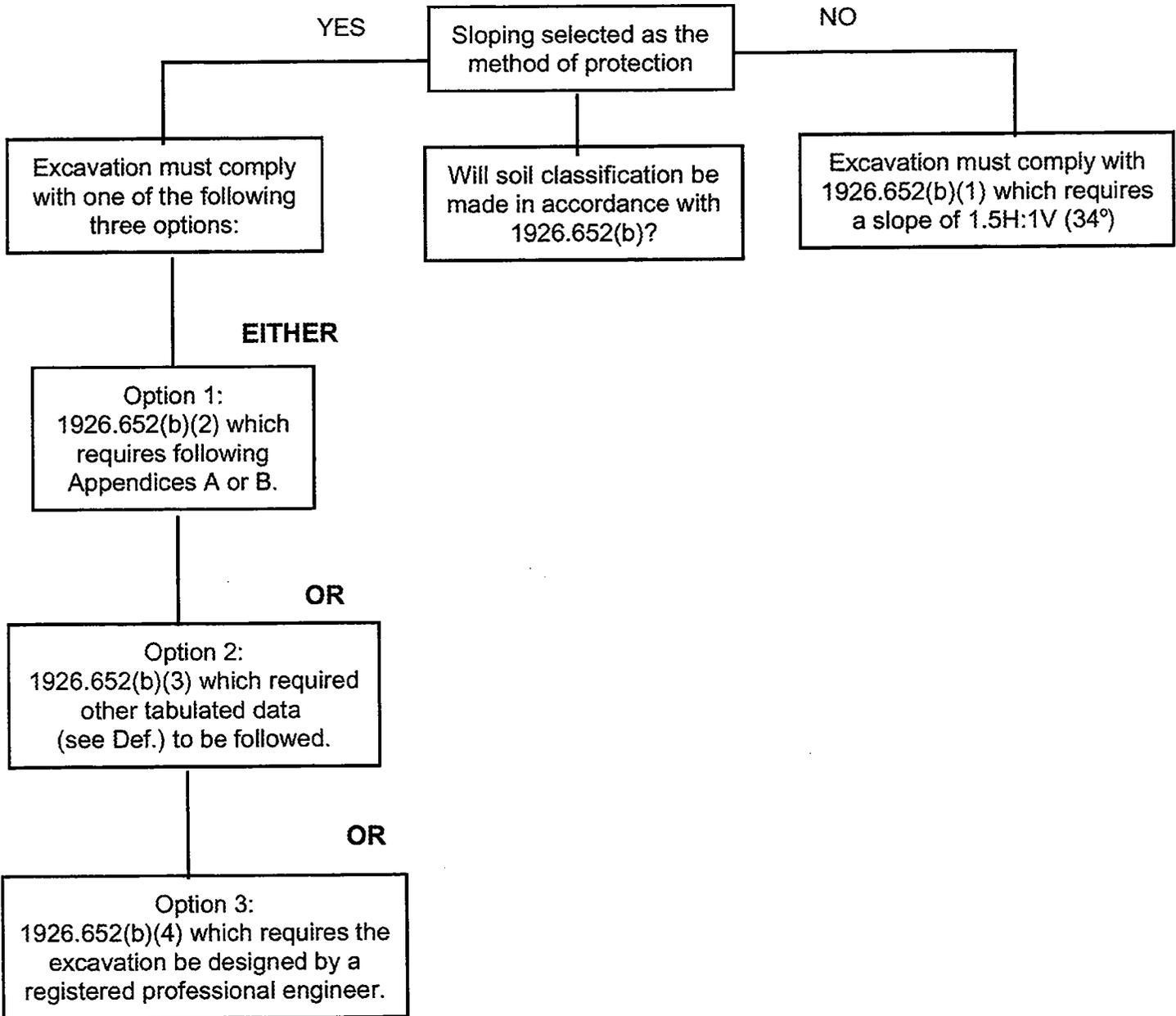
ATTACHMENT 4
SELECTION OF PROTECTIVE SYSTEMS FOR EXCAVATIONS 20 FEET OR LESS IN DEPTH



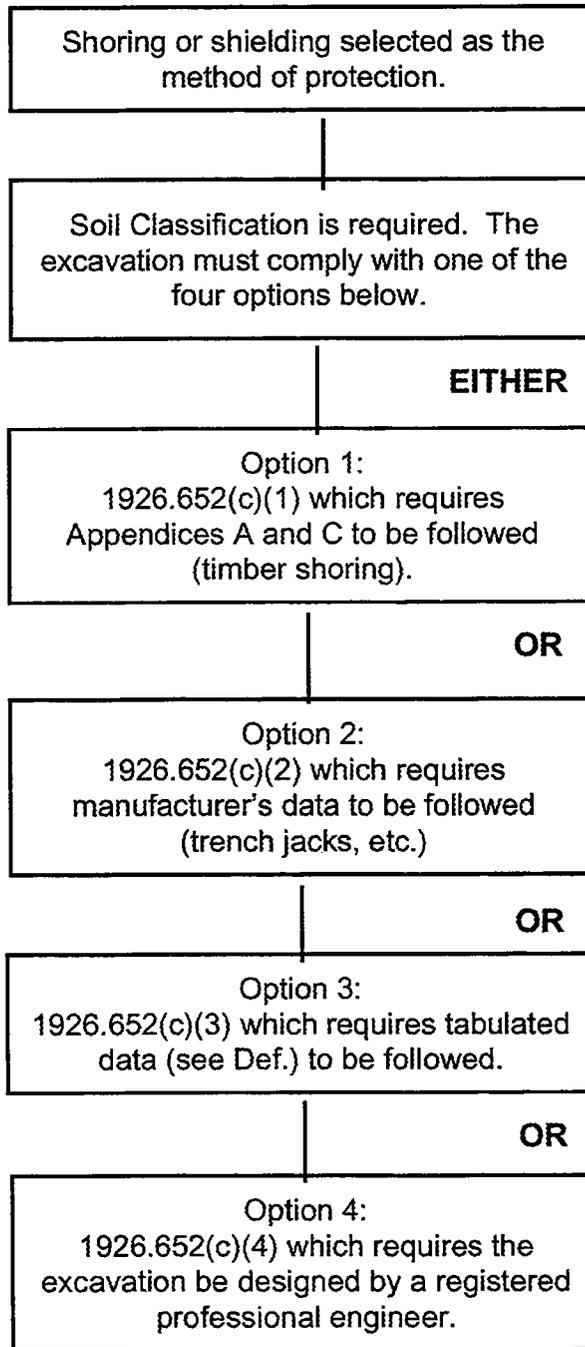
For excavations greater than 20 feet in depth, design by a registered professional engineer in compliance with 1926.652 (b) and (c) is required.



ATTACHMENT 5 SLOPING OPTIONS



**ATTACHMENT 6
SHORING OR SHIELDING OPTIONS**



APPENDIX B

IT PROCEDURE HS314, HOT WORK IN HAZARDOUS LOCATIONS



PROCEDURE

Subject: HOT WORK

1.0 PURPOSE AND SUMMARY

The purpose of this procedure is to establish guidelines for company hot work activities. The type of hot work activities covered by this procedure include all spark- or flame-producing operations capable of initiating a fire or explosion. These activities may include welding, braising, cutting, grinding, etc.

Some clients may have requirements that differ from those contained in this procedure. In such circumstances, the more protective requirements will be followed.

2.0 TABLE OF CONTENTS

- 1.0 Purpose and Summary
- 2.0 Table of Contents
- 3.0 Responsibility Matrix
 - 3.1 Procedure Responsibility
 - 3.2 Action/Approval Responsibilities
- 4.0 Definitions
- 5.0 Text
 - 5.1 Supervisor Responsibilities
 - 5.2 Fire Prevention Precautions
 - 5.3 Preparation for Hot Work
 - 5.4 Hot Work Permit
- 6.0 Exception Provisions
- 7.0 Cross References
- 8.0 Attachments

3.0 RESPONSIBILITY MATRIX

3.1 Procedure Responsibility

The Vice President, Health and Safety is responsible for the issuance, revision, and maintenance of this procedure.

3.2 Action/Approval Responsibilities

The Responsibility Matrix is Attachment 1.



4.0 DEFINITIONS

Company - All wholly-owned subsidiaries of The IT Group, Inc.

5.0 TEXT

5.1 Supervisor Responsibilities

Based on fire/explosion potentials, project/location supervisors are to establish approved areas for welding, cutting, and other types of hot work. The supervisor will be aware of the hazards involved and familiar with the provisions of this procedure, and may delegate his/her responsibilities to a qualified employee.

The supervisor will ensure that cutters or welders are properly trained in the safe operation of their equipment, the safe use of the process, the requirements of this procedure, and emergency procedures. Only approved apparatus, such as torches, manifolds, regulators or pressure-reducing valves, and acetylene generators will be used by company employees and contractor personnel.

Only those contractors who have suitably qualified personnel to perform welding, cutting, and other types of hot work will be utilized. These contractors will be advised about specified hot work areas and hazardous locations where special procedures for hot work are necessary.

5.2 Fire Prevention Precautions

Hot work will only be permitted in areas that are or have been made firesafe. This can be achieved by using a specific area designed or approved for such work, such as a maintenance shop or a detached outside location which will be of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas. When work cannot be relocated, the area will be made firesafe by removing combustibles or protecting combustibles from ignition sources.

Hot work will NOT be permitted in the following situations unless specific approval is given by a health and safety representative:

- In the presence of a potentially explosive atmosphere (mixtures of flammable gases, vapors, liquids, or dusts with air), or inside drums, tanks, or other containers, and equipment in which an explosive atmosphere may develop.
- In any area where combustible gases are in excess of ten percent (10%) of the lower explosive limit (LEL).
- On storage or process vessels or lines which contain or have contained flammable or combustible liquids, gases, vapors, or solids.



5.3 Preparation for Hot Work

Before hot work is permitted, the area will be inspected by a supervisor to ensure that the following requirements have been met:

- Equipment will be in safe operating condition and in good repair.
- Where practical, all combustible material will be relocated at least 35 feet horizontally from the area of work. Where relocation is impractical, combustibles will be protected with flame-proofed covers or otherwise shielded.
- Openings or cracks in walls, floors, or ducts within 35 feet of the area of hot work will be tightly covered to prevent the passage of sparks to adjacent areas.
- Where cutting or welding is to be done near walls, partitions, ceiling, or roof of combustible construction, fire-resistant shields or guards will be provided to prevent ignition. If welding is to be done on a metal wall, partition, ceiling, or roof, precautions will be taken to prevent ignition of combustibles on the other side, due to conduction or radiation.
- Fully charged and operable fire extinguishers, appropriate for the type of possible fire, will be available at the work area. Where fire hose lines are available, they will be connected and ready for use.
- Fire watchers will be required whenever hot work is performed in hazardous locations or when specified by the supervisor.
- Combustible gas readings will be taken in areas where combustible gases and vapors may exist.
- The work area is free of toxic contaminants at concentrations in excess of established threshold limit values, or all personnel who will work in the area have been provided respiratory protective devices and protective apparel appropriate for the degree of exposure.
- Prior to performing hot work on painted surfaces, a lead-based paint survey will be conducted.
- If hot work requires entry into a confined space, all provisions of Procedure HS300, Confined Spaces, will be met.
- When hot work is to be performed on tanks or other vessels that contain or have contained flammable or combustible liquids, the vessel will be properly isolated, purged, or inerted, as appropriate, to reduce the concentrations of flammable and toxic air contaminants to safe levels.



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- When hot work is to be performed on the bottoms of tanks or other vessels that are not supported above grade, special procedures will be followed due to the possible entrapment of flammable liquids or vapors beneath the tank. For vessels that have at one time contained flammable materials, refer to "Preparing Tank Bottoms for Hot Work," Petroleum Safety Data 2207, American Petroleum Institute. Work will be performed on stationary tank bottoms only when personnel have become familiar with this reference and are prepared to follow the outlined procedures.

5.4 Hot Work Permit

When the supervisor is satisfied that all the requirements in the preceding section have been met, the Hot Work Permit (Attachment 2) will be completed, reviewed with employees who will perform the hot work, and maintained near the work area. The Hot Work Permit is good only for the date issued, and is valid only for the shift for which it is issued.

If at any time during the hot work operation a change in conditions at the work area is suspected, such as release of flammable gases or vapors, work will be stopped immediately and the supervisor will be notified. Such work stoppage invalidates the Hot Work Permit, and a new permit will be completed after inspections and tests have been performed by a supervisor.

6.0 EXCEPTION PROVISIONS

Variations and exceptions may be requested pursuant to the provisions of Procedure HS013, Health and Safety Procedure Variations.

7.0 CROSS REFERENCES

HS013 Health and Safety Procedure Variations
HS300 Confined Spaces

8.0 ATTACHMENTS

1. Responsibility Matrix
2. Hot Work Permit



**ATTACHMENT 1
 HOT WORK**

Responsibility Matrix

Action	Procedure Section	Responsible Party		
		Project/Location Supervisor	Health and Safety Representative	Vice President Health and Safety
Issuance, Revision, and Maintenance of Procedure	3.1			X
Establish Approved Areas for Hot Work	5.1	X		
Ensure Employees Conducting Hot Work are Qualified	5.1	X		
Approve Hot Work in Hazardous Locations	5.2		X	
Inspect Hot Work Areas	5.3	X		
Complete Hot Work Permit	5.4	X		

