

**Site-Specific Safety and Health Plan Attachment
Long-Term Monitoring Program at Landfills No. 1, 2, and 3
Fort McClellan
Calhoun County, Alabama**

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**

**Delivery Order CK004
Contract No. DACA21-96-D-0018
IT Project No. 773191**

December 1997

Revision 0

**Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Anniston, Alabama**

I have read and approve this site-specific safety and health plan attachment for the Long-Term Monitoring Program at Landfills No. 1, 2, and 3 at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT procedures.

Jeanne Yacoub, PE
Project Manager

Date

Michael Henderson, CIH
Health & Safety Manager

Date

To Be Determined
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Long-Term Monitoring Program at Landfills No. 1, 2, and 3 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 attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Fort McClellan Gate Hours

GATE 1	0600 - 2000 7 days a week. 0600 - 0800 One-way in-bound traffic only (westbound). Monday through Friday, except holidays. 1500 - 1800 One-way out-bound traffic only (eastbound). Monday through Friday, except holidays.
GATE 2	0600 - 0830 Monday through Friday except holidays. 1500 - 1800 Monday through Friday except holidays. Closed on weekends and holidays.
GATE 3	Gate 3 Road. Open 24 hours daily, 7 days a week.
GATE 5	Gate 5 Road. Open 24 hours daily, 7 days a week. Closed on weekends during deer season.
Summeral Gate	Summeral Road. 0500 - 2100, 7 days a week. Closed weekends and holidays.
Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
Galloway Gate	Galloway Road. 0500 - 2100, 7 days a week.

Fort McClellan Project Emergency Contacts

Fire Department (on post)	Ext. 17
Fire Department (off post)	(205) 820-1117
Ambulance (on post)	Ext. 12
Ambulance (off post)	(205) 848-2315
Military Police (on post)	Ext. 5-3821
Military Police (off post)	(205) 848-5555
Regional Medical Center	(205) 235-5121
Chemical Agent Emergencies	Ext. 17
UXO Emergencies	Ext. 17
UXO Nonemergencies/Reporting Only (Ronald Levy)	(205) 848-3758
National Response Center	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(205) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(423) 690-3211
Michael Henderson, IT H&S Manager	(423) 690-3211
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

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List of Acronyms

DCA	dichloroethane
DCE	dichloroethene
DDE	dichlorodiphenyldichloroethene
FTMC	Fort McClellan
PAH	polynuclear aromatic hydrocarbon
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
SVOC	semivolatile organic compound
TCA	trichloroethane
VOH	volatile organic hydrocarbon

1.0 Site Work Plan Summary

Project Objective. The objective of activities associated with long-term monitoring at Landfills No. 1, 2, and 3 at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze groundwater samples from the existing 26 monitoring wells during an initial sampling round and on a quarterly basis for three quarters. The data obtained from the analysis will be compiled, interpreted, and presented in a technical report that will be utilized to make risk-based decisions on future actions at the landfills.

Project Tasks

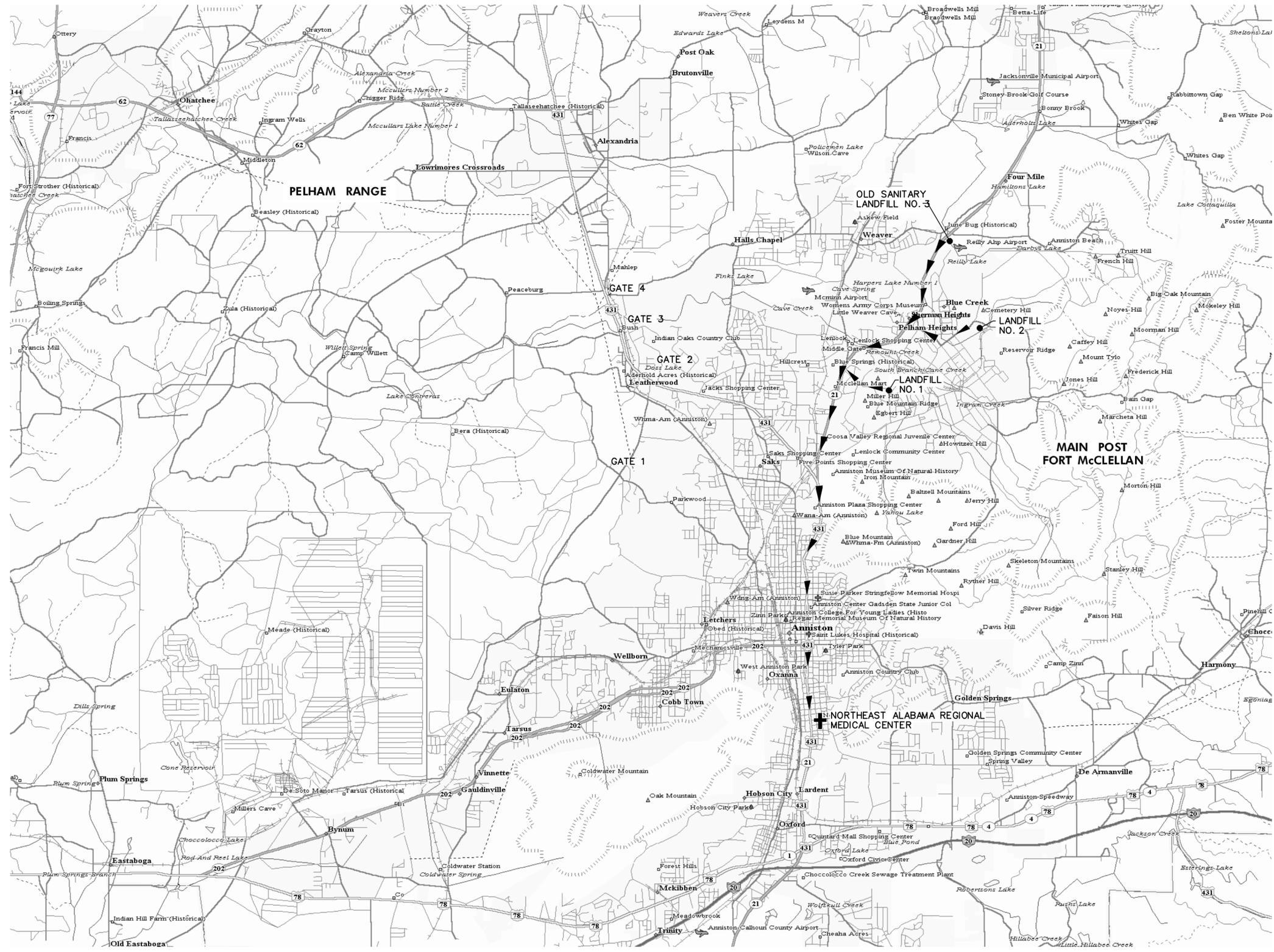
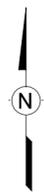
- Collect groundwater samples from the 26 monitoring wells initially.
- Collect groundwater samples from the monitoring wells quarterly.
- Measure groundwater levels at the wells.
- Measure field parameters during sampling activities.
- Analyze the samples for target analyte list parameters and compute the site relative risk.
- Decontaminate sampling equipment. Package and ship samples.

Personnel Requirements. Up to 10 employees.

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).

STARTING DATE: 11/25/97
 DRAFT, CHECK BY: M. HENDERSON
 ENGR. CHECK BY: J. YACOB
 DATE LAST REV.:
 DRAWN BY: J. STOUT

02/24/03
 09:55:34 AM
 C:\ADD\Design\7319ES.015



LEGEND:
 —▶ PRIMARY ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER

FIGURE 1-1
HOSPITAL LOCATION MAP
FORMER LANDFILL NOS. 1, 2, AND 3

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



NOT TO SCALE

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).

Landfill No. 1 was used as a sanitary landfill from 1945 to 1947. Groundwater contaminants include lead, 1,3-dinitrobenzene, and -BHC. Soil contaminants include trace quantities of lead arsenic and DDE. Surface water contaminants include trace concentrations of 1,1,1-trichloroethane, chlorobenzene, and 1,2-dinitrobenzene.

Landfill No. 2 was used as a sanitary landfill from approximately 1927 to 1947. Rusted drums, metals, small containers, assorted building materials, machinery parts, and demolition debris were observed in previous site investigations. Groundwater contaminants include trace amounts of metals, aldrin, and methyl isobutyl ketone. Contaminants were not detected in surface water or sediment samples collected from Cave Creek at the landfill.

Landfill No. 3 was used as a sanitary landfill from 1946 to 1967. Wastes reported to have been deposited at the landfill include empty pesticide containers, ammunition, buried ammunition pallets or crates, paint containers, fluorescent bulbs, ballasts, waste oil, construction debris, municipal waste, and experimental animals. Groundwater contaminants include tetrachloroethene, methylene chloride, 1,1-dichloroethane, trans-1,2-dichloroethene, benzene, bis(2-ethylhexyl)phthalate, chlorobenzene, trichloroethene, and pentachlorophenol. Surface soil contaminants include trace concentrations of arsenic, lead, mercury, benzo(a)anthracene, chrysene, fluoranthene, phenanthrene, and pyrene. Sediment contaminants include trace concentrations of metals, pesticides, and PAH compounds. Surface water contaminants include lead, 1,1,1-TCE, TCE, and lindane.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at Landfills No. 1, 2, and 3.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 9)

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
Aldrin [309-00-2]	?	?	Inh Abs Ing Con	Headache, dizziness, nausea, myoclonic jerks of limbs, clonic, convulsions, coma, hematuria, azotemia. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.25 mg/m ³ 0.25 mg/m ³ 0.25 mg/m ³ Skin	- - - -	PEL TLV REL	25 mg/m ³
Arsenic and soluble inorganic compounds (as As) [7740-38-2]	NA	NA	Inh Abs Ing Con	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances; hyperpigmentation of the skin (carcinogenic); peripheral neuropathy, respiratory irritation.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention	0.01 mg/m ³ 0.2 mg/m ³ (Ca-29 CFR 1910.1018 Inorganic compounds)	C0.002 mg/m ³	PEL TLV REL	Ca [100 mg/m ³]
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm	5 ppm C1 ppm (Ca)	PEL TLV REL	Ca [1,000 ppm]* *OSHA
1,1-Dichloroethane [75-34-3]	11.06 eV	?	Inh Ing Con	Irritation to skin, CNS depression, liver, kidney, and lung damage	Eye: Irrigate immediately Skin: Wash with soap immediately Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm		PEL TLV REL	3000 ppm

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
1,2-Dichloroethane (ethylene dichloride) [107-06-02]	11.05	?	Inh Abs Ing Con	Depressed central nervous system, nausea, vomiting, dermatitis, irritated eyes, corneal opacity. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm 10 ppm 1 ppm	2 ppm 2 ppm	PEL TLV REL	Ca [1,000]
1,2-Dichloroethylene [540-59-0]	9.65	17	Inh Ing Con	Irritated eyes and respiratory system; depressed central nervous system.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm		PEL TLV REL	4,000 ppm
Dichloromethane, see methylene chloride									
1,3-Dinitrobenzene [99-65-0]	10.43 eV	?	Inh Abs Ing Con	Anoxia, cyanosis, bad taste, burning mouth, dry throat, thirst, yellowing hair, eyes, and skin, anemia, liver damage.	Eye: Irrigate immediately Skin: Wash with soap immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m ³ 1 mg/m ³ 1 mg/m ³ Skin		PEL TLV REL	50 mg/m ³
Ethyl benzene [100-41-4]	8.76	0.09–0.6	Inh Ing Con	Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm 125 ppm	PEL TLV REL	2,000 ppm

Table 2-1

**Toxicological and Physical Properties of Chemicals
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Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Fuel Oil No. 1, see kerosene. [NA]								PEL TLV REL	
Fuel Oil No. 2, see fuel oil. [NA]								PEL TLV REL	
Fuel Oils No. 4, 5, and 6 [NA]	?	?	Abs Con	Low toxicity; prolonged contact may produce systemic effects.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Kerosene [8008-20-6]	?	?	Inh Ing Con	Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakens; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 mg/m ³		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	?
n-Hexane [110-54-3]	10.18	65-248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Hexone [108-10-1]	9.3 eV		Inh Ing Con	Irritation of the eyes, skin, and mucus membranes, headache, narcosis, coma, dermatitis.	Eye: Irrigate immediately Skin: Flush with water promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 50 ppm 50 ppm	75 ppm 75 ppm	PEL TLV REL	500 ppm
Hydrogen chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C5 ppm C5 ppm C5 ppm	PEL TLV REL	100 ppm

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm
Lead [7439-92-1]	NA	NA	Inh Ing Con	Weak, insomnia, facial pallor, low weight, anorexia, abdominal pain, constipation, colic, anemia, tremor, gingival lead line, tremor, paralysis of wrist and ankles, encephalopathy, hypotension, kidney disease.	Eye: Irrigate immediately Skin: Wash with soap immediately Breath: Respiratory support Swallow: Immediate medical attention	0.5 mg/m ³ 0.05 mg/m ³ 0.1 mg/m ³		PEL TLV REL	100 mg/m ³
Methane	12.48	NA	Inh	Simple asphyxiant	Breath: Fresh air				
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention		200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm
Methylene chloride (dichloromethane) [75-09-2]	11.32	?	Inh Ing Con	Fatigue, weakness, sleepi- ness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 50 ppm	C1,000 ppm; C2,000 mg/m ³ (5 min in 2 hrs)	PEL TLV REL	Ca (5,000 ppm)
Methyl ethyl ketone [78-93-3]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm 300 ppm	PEL TLV REL	3,000 ppm

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Methyl isobutyl ketone (see Hexone)									
Motor oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 mins) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
Naptha, see petroleum distillate									
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
Pentachlorophenol [87-86-5]	NA	?	Inh Abs Ing Con	Irritation of the eyes, nose, and throat; sneezing, coughing, weakness, sweating, headache, dizziness, nausea, vomiting, dyspnea, chest pain, high fever, dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	0.5 mg/m ³ 0.5 mg/m ³ 0.5 mg/m ³ Skin		PEL TLV REL	2.5 mg/m ³
Petroleum distillate (Naptha) [8002-05-9]	?	?	Con Ing	Coughing, dyspnea, nausea, or vomiting.		400 ppm		PEL TLV REL	
Petroleum hydrocarbons, see Stoddard solvent									

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
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	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C2 mg/m ³ C2 mg/m ³ C2 mg/m ³	PEL TLV REL	250 mg/m ³
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
Stoddard Solvent [8052-41-3]	?	?	Inh Ing Con	Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 350 mg/m ³		PEL TVL REL	20,000 mg/m ³
1,1,2,2-Tetrachloroethane [79-34-5]	11.10 eV	?	Inh Ing Con	Nausea, vomiting, abdominal pain, tremor fingers, jaundice, hepatitis, tender liver, dermatitis, kidney damage. Carcinogen.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	5 ppm 1 ppm 1 ppm skin		PEL TLV REL	100 ppm
Tetrachloroethene (see Tetrachloroethylene)									

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

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Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Tetrachloroethylene (perchloroethylene) [127-18-4]	9.32	47	Inh Ing Con	Irritates eyes, nose, throat; nausea; flushed face, neck; vertigo, dizziness, incoordination; headache, sleepiness; skin redness; liver damage, suspected human carcinogen.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	25 ppm 50 ppm	200 ppm minimize exposure (LOQ 0.4 ppm)	PEL TLV REL	Ca [500 ppm]
1,1,1- Trichloroethane (methyl chloroform) [71-55-6]	11.0	390	Inh Ing Con	Headache, lassitude; central nervous system depression, poor equilibrium; irritated eyes; dermatitis; cardiac arrhythmia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	350 ppm 350 ppm	450 ppm 450 ppm C350 ppm	PEL TLV REL	1,000 ppm
Trichloroethene, see Trichloroethylene									
Trichloroethylene (TCE, trichloroethene) [79-01-6]	9.45	21.4	Inh Ing Con	Headache, vertigo; visual disturbance, tremors, somnolence, nausea, vomiting; irritated eyes; dermatitis; cardiac arrhythmia, paresthesia. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 25 ppm	200 ppm 200 ppm Ca	PEL TLV REL	Ca [1,000 ppm]
Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3]	8.56/ 8.56/ 8.44	1.1–20	Inh Abs Ing Con	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuo- lization; 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 150 ppm	PEL TLV REL	1,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals Former Landfills No. 1, 2, and 3 Fort McClellan, Calhoun County, Alabama

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^aIP = Ionization potential (electron volts).

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

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

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

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

AEL = Airborne Exposure Limit.

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

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

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

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

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

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

References:

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Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.

Verschueren, 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.

2.2 General Site Information

Location and Approximate Size of Site. Landfill No. 1 is located between 16th Avenue and Avery Drive, adjacent to the flood plain of an intermittent creek that drains into Remcount Creek. The landfill covers approximately 11 wooded acres.

Landfill No. 2 is located between 2nd Avenue and 10th Street, on the southwestern tip of Cemetary Hill. The site covers approximately 1.5 acres of heavily wooded acres.

Landfill No. 3 is located on the northwest corner of the Post bounded by the Anniston-Jackson Highway to the west, 3rd Avenue to the east, the installations boundary to the north, and Cave Creek to the south. The site covers approximately 22 acres of an area of dense pine trees.

Duration of Planned Employee Activity. Employee activity duration is 1 month initially and one week, every three months, for a year.

Site Topography. Landfill No. 1 is located on the side of a hill and slopes steeply to the southeast toward 16th Avenue. Landfill No. 2 is located in the flood plain of Cave Creek, which is an intermittent stream flowing south-southeast of the landfill. Landfill No. 3 is in a mountainous area.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

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
Staging equipment	Level D
Collecting samples	Modified Level D*
Decontaminating equipment	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone 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

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

- Permeable Tyvek, Kleenguard, or its equivalent (poly-coated tyvek where splash is anticipated).
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat.

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/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- 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

4.0 Site Monitoring

The potential environmental contaminants of concern (COC) for Landfill No. 1 activities are lead, 1,1,1-trichloroethane, and 1,3-dinitrobenzene. The potential environmental COCs for Landfill No. 2 activities are aldrin, methyl isobutyl ketone, and acetone. The potential environmental COCs for Landfill No. 3 activities are tetrachlorethene, 1,1,2,2-tetrachloroethane, 1,1-dichloroethane, chlorobenzene, trichloroethene, benzene, and pentachlorophenol.

Chemical. Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations (see Table 4-1). A calibrated flame ionization detector (i.e., OVA 128 or equivalent) or photoionization detector (i.e., HNu, Microtip, or equivalent) organic vapor analyzer with an 11.7 eV lamp will be utilized to monitor the wells and breathing zones, to determine if any organic material may be present that would necessitate upgrading of protection level (see Table 4-2). A combustible gas indicator (CGI) will be utilized to monitor the wells to determine if any combustible gases, i.e., methane, may be present.

Intrusive operations include collection of water samples.

Nonintrusive operations that do not disturb existing materials include site setup, decontamination, and miscellaneous support zone activities.

Based on the nature of the job, no ambient air monitoring for dust will be employed.

Table 4-1

**Air Monitoring Frequency and Location
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Sampling (groundwater and soil)	OV Monitor LEL/O ₂ Monitor	Initially for location Continuously during sampling activities	BZ of employees Support zone At well opening

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

Table 4-2
Action Levels
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level	Required Action ^a
VOHs	≥ 10 ppm above background in BZ	Stop work, evacuate work area, upgrade to Level B
Benzene	≥ 5 ppm in 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

When in Level D Modified/D PPE

Analyte	Action Level	Required Action ^{b,c}
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.
Benzene	≥ 1 ppm in BZ	Upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations Stop work, evacuate work area
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area Continue operations, monitor for VOCs

Table 4-2

**Action Levels
Former Landfills No. 1, 2, and 3
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.

^c If VOH readings greater than or equal to 5 ppm are observed for 5 minutes, then a benzene detector tube will be used to determine if benzene is present in concentrations ≥ 1 .

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

5.0 Activity Hazard Analysis

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

- Setup of equipment and general field activities
- Groundwater sampling.

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 1-1.

Table 5-1

**Activity Hazard Analysis
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 6)

Activity	Potential Hazards	Recommended Controls
Staging equipment	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Determine best access route before transporting equipment. • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing.
	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	<ul style="list-style-type: none"> • Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	<ul style="list-style-type: none"> • Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	<ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	<ul style="list-style-type: none"> • Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	<ul style="list-style-type: none"> • Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	<ul style="list-style-type: none"> • Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	<ul style="list-style-type: none"> • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	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.
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
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 6)

Activity	Potential Hazards	Recommended Controls
Staging equipment (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.
	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
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 6)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> • Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow. • Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. • Barriers shall be used to protect workers from vehicular traffic. • Barriers shall be used to guard excavations adjacent to streets or roadways. • Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. • Heavy equipment shall have backup alarms.
	Forklift operations	<ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	<ul style="list-style-type: none"> • Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. • Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. • Electrical tools shall be inspected daily prior to use.
	Extension cords	<ul style="list-style-type: none"> • Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. • Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. • Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.). • Cords shall be designed for hard duty. • Cords shall be inspected daily.

Table 5-1

**Activity Hazard Analysis
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 6)

Activity	Potential Hazards	Recommended Controls
Staging equipment (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. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	<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.
Groundwater 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 water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Combustible gases	<ul style="list-style-type: none"> • Monitor the well initially and throughout sampling operation.
	Cut hazards	<ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	<ul style="list-style-type: none"> • MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.

Table 5-1

**Activity Hazard Analysis
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 6)

Activity	Potential Hazards	Recommended Controls
Groundwater sampling (continued)	Strains/sprains	<ul style="list-style-type: none"> • Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	<ul style="list-style-type: none"> • Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	<ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	<ul style="list-style-type: none"> • Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Moving and shipping collected samples	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	<ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	<ul style="list-style-type: none"> • Wear adequate hand protection. Use care when handling glassware.
	Hazard communication Heavy lifting	<ul style="list-style-type: none"> • Label all containers as to contents and associated • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
Material storage	Flammable and combustible liquids	<ul style="list-style-type: none"> • Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.

Table 5-1

**Activity Hazard Analysis
Former Landfills No. 1, 2, and 3
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 6)

Activity	Potential Hazards	Recommended Controls
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> • Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection.