



64559

**Site-Specific Safety and Health Plan
Interim Remediation of Soils
L'Henri, Inc.
Tutu, St. Thomas, U.S. Virgin Islands**

Prepared for:

**L'Henri, Inc.
Route 38
Tutu, St. Thomas, U.S. Virgin Islands**

Prepared by:

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IT Project Number: 409830

Disclaimer

This Site Specific Health and Safety Plan (SSHP) and its addendums is for use by IT Corporation personnel only. This SSHP is designed to address operations performed by IT personnel and is not intended to address any other operations by any other non-IT personnel.

Reviews and Approvals

Project Manager
IT Corporation

Date

Health and Safety Representative
IT Corporation

Date

Site Health and Safety Plan Acknowledgement_____

I have read, understand and agree to abide by the provisions as detailed in this Site-Specific Health and Safety Plan prepared by IT Corporation. Failure to comply with these provisions may lead to disciplinary action and/or my dismissal from the work site.

Printed Name

Signature

Employee Number

Date

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List of Acronyms

AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
CET	Certified Environmental Trainers
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
CRZ	contamination reduction zone
dBA	decibels
DBCP	dibromochloropropane
DCE	1,2-dichloroethylene
DEET	n,n-diethyltoluamide
CRZ	contamination reduction zone
EKG	electrocardiogram
EZ	exclusion zone
°F	degrees Fahrenheit
FADL	field activity daily log
ft	feet/foot
ft ³	cubic feet
H&S	health and safety
IDLH	immediately dangerous to life and health
IH	industrial hygiene
IT	IT Corporation
LEL	lower explosive limit
mm	millimeter
MSA	method of standard addition
MSDS	Material Safety Data Sheets
NIOSH	National Institute of Occupational Safety and Health
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PCB	polychlorinated biphenyls
PCE	perchloroethylene
P.E.	Professional Engineer
PEL	permissible exposure limit

List of Acronyms (Continued)

PID	photoionization detector
PM	project manager
PPE	personal protective equipment
ppm	parts per million
RA	remedial action
SCBA	self-contained breathing apparatus
TCE	trichloroethylene
TSD	treatment, storage, and disposal
U.S. DOL	U.S. Department of Labor
U.S. DOT	U.S. Department of Transportation
U.S. EPA	U.S. Environmental Protection Agency

1.0 Introduction

1.1 Objectives

The objective of the Health and Safety (H&S) Plan is to ensure that safe working conditions exist at the site. The safety organization and procedures have been established based on an analysis of potential hazards, and personnel protection measures have been selected in response to this analysis. This H&S Plan will be implemented and followed by IT Corporation (IT) personnel during the work activities at the L'Henri, Inc. located in St. Thomas, U.S. Virgin Islands.

1.2 Facility and Location Description

L'Henri, Inc. site is an operating dry cleaning establishment located on Highway 38. Four monitoring wells exist on the site in various locations which include an area near the dry cleaning facility, an area in the parking lot, and a vegetated area behind the facility. The facility utilized solvents for dry cleaning operations such as perchloroethylene (PCE), trichloroethylene (TCE), and 1,2-dichloroethylene (DCE). Contamination of the site was a result the processes at the site and preliminary investigative work surveys have indicated that most of the PCE contamination is located in the vicinity of soil boring SS1 which is near the southwest corner of the laundry building.

1.3 Policy Statement

It is the policy of IT to provide a safe and healthful work environment for all its employees. IT considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency or shortcuts. At IT we believe every accident and every injury is preventable. We will take every reasonable step to reduce the possibility of injury, illness, or accident.

This H&S Plan prescribes the procedures that must be followed during the activities at L'Henri, Inc. Operational changes which could affect the health or safety of personnel, the community, or the environment will not be made without the prior approval of the IT Project Manager (PM), and the Project H&S Coordinator.

The provisions of this plan are mandatory for all IT personnel assigned to the project.

1.4 References

This H&S Plan complies with applicable Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency (U.S. EPA) regulations. This plan follows the guidelines established in the following:

- Standard Operating Safety Guidelines (U.S. EPA, November 1984)
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (National Institute of Occupational Safety and Health [NIOSH] 86-116)
- Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, U.S. Department of Labor (U.S. DOL)/OSHA.

The contents of this plan are consistent with the following IT H&S policies and procedures:

- HS001 Safety Policy
- HS002 Safety Policy: International Operations
- HS010 Employee Safety and Health Works Rules
- HS011 Contractor Safety and Health Rules
- HS012 Chemical Hygiene Plan and Safety Manual
- HS013 Health and Safety Procedure Variances
- HS018 Safety Councils
- HS019 Injury and Illness Prevention Program
- HS020 Accident Prevention Program: Reporting, Investigation, and Review
- HS021 Accident Prevention Program: Management Safety Audits and Inspections
- HS022 Accident Prevention Program: Review of New Proposals, Projects, Operations, and Construction
- HS040 Stop Work Authority
- HS041 Embryo-Fetus Protection Program
- HS050 Training Requirements
- HS051 Tailgate Safety Meetings
- HS052 Health and Safety Plans
- HS060 Hazard Communication Program
- HS080 Insurance Claims
- HS090 OSHA Regulatory Inspections
- HS091 Serious Injury and Fatality Reporting Requirements
- HS092 Occupational Injury and Illness Recordkeeping
- HS100 Medical Policies and Procedures
- HS101 Drug and Alcohol Testing
- HS102 Access to Employee Exposure and Medical Records
- HS103 Maintenance of Employee Exposure and Medical Records
- HS104 Employee Notification of Industrial Hygiene Monitoring Results

- HS105 Occupational Injuries/Illnesses Procedures
- HS106 First Aid Kits
- HS300 Confined Spaces, Industrial
- HS301 Confined Spaces, Marine
- HS302 Confined Spaces, Leaded Product
- HS303 Hydroblasting
- HS304 Compressed Gas
- HS305 Pressurized Systems
- HS306 Handling Known Compressed Gas Cylinders
- HS307 Excavation and Trenching
- HS308 Scaffolding
- HS309 Underground Storage Tank Removal
- HS310 Hazardous Waste Operations at Uncontrolled Waste Sites
- HS311 Emergency Response Operations
- HS312 Hazardous Waste Operations at Treatment, Storage, and Disposal (TSD) Facilities
- HS313 TSD Facilities - Minimum Staffing Requirements
- HS314 Hot Work in Hazardous Locations
- HS315 Control of Hazardous Energy Sources (Lockout/Tagout)
- HS400 Working in Hot Environments
- HS401 Cold Stress
- HS402 Hearing Conservation Program
- HS500 Handling of Polychlorinated Biphenyls (PCB)
- HS501 Handling of PCBs in the Laboratory
- HS502 PCB Contaminant and Spill Prevention Requirements for Transport Vehicles
- HS503 Handling of Dioxin and Furan Contaminated Materials
- HS504 Handling of Dioxin in the Laboratory
- HS505 Handling of Inorganic Lead, Inorganic Lead Compounds, and Organic Lead Soaps
- HS506 Handling of Inorganic Arsenic
- HS507 Handling of Dibromochloropropane (DBCP)
- HS508 Handling of Beryllium and Beryllium Contaminated Materials
- HS509 Handling, Removal and Disposal of Asbestos and Asbestos Contaminated Materials
- HS510 Asbestos Work in Schools
- HS511 Handling of Benzene and Benzene Contaminated Materials
- HS512 Handling of Blood or Other Potentially Infectious Materials
- HS513 Handling Radioactive Materials
- HS600 Personal Protective Equipment
- HS601 Respiratory Protective Program
- HS602 Eye Protection - Prescription Safety Glasses
- HS603 Maintenance of Survey Equipment
- HS604 Use and Maintenance of Portable Electrical Equipment
- HS605 Electron Capture Detectors
- HS606 Soil Density Gauges
- HS800 Motor Vehicle Operation: General Requirements

- HS810 Commercial Motor Vehicle Operation and Maintenance
- HS820 Forklift Operation
- HS821 Breathing Air Cylinder Trailer
- HS822 Mobil Crane Inspection.

2.0 Responsibilities

2.1 All IT Personnel

Each IT person is responsible for the H&S of themselves and their IT coworkers, for completing tasks in a safe manner, and reporting any unsafe acts or conditions to their Supervisor and/or the Site Supervisor. All personnel are responsible for continuous adherence to these H&S procedures during the performance of their work. No person may work in a manner that conflicts with the letter or the intent of, or the safety and environmental precautions expressed in these procedures. After due warnings, IT will dismiss from the site any IT person who violates safety procedures. IT's employees are subject to progressive discipline and may be terminated for blatant or continued violations. All on-site IT personnel will be trained in accordance with 29 CFR 1910.120 and this document.

2.2 Project Manager

The PM is ultimately responsible for ensuring that all IT project activities are completed in accordance with requirements set forth in this plan. The PM must perform at least one on-site safety review during the project. The PM is responsible for ensuring all IT accidents and IT incidents on the project are reported and thoroughly investigated. The PM must approve in writing any addenda or modifications of the H&S plan.

2.3 Project Health and Safety Coordinator

The Project H&S Coordinator is responsible for the preparation and modification of this H&S plan. Any changes to the H&S plan must be approved by the Project H&S Coordinator. The Project H&S Coordinator will advise the PM on H&S issues and will establish and oversee the project air monitoring program. The H&S Coordinator is the designated regulatory contact on matters related to occupational H&S.

2.4 Site Supervisor

The Site Supervisor will be responsible for field implementation of the H&S plan. This will include communicating site requirements to all on-site IT personnel and consultation with the Project H&S Coordinator. As required by IT Policy and Procedure HS022, the Site Supervisor will be responsible for informing the Project H&S Coordinator and the PM of any changes in the work plan, so that those changes may be properly addressed. Other responsibilities include:

- Enforcing the requirements of the H&S plan. This includes performing daily safety inspections of the work site.
- Determining and posting routes to capable medical facilities and emergency telephone numbers (including poison control facilities) and arranging emergency transportation to medical facilities.
- Notifying local public emergency officers of the nature of the site operations, and posting of their telephone numbers in an appropriate location.
- Observing on-site IT project personnel for signs of chemical or physical trauma.
- Ensuring that all IT site personnel have been given the proper medical clearance, ensuring that all IT site personnel have met appropriate training requirements and have the appropriate training documentation on site, and monitoring all team members to ensure compliance with the H&S plan.

2.5 IT Subcontractors

IT will not have any subcontractors during this field effort.

2.6 On-Site Personnel and Visitors

This plan does not cover any operations and/or non-IT personnel.

3.0 Job Hazard Analysis

The Job Hazard Analysis identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community, and the environment. Because of the complexity and constant change of remedial projects, supervisors must continually inspect the work site to identify hazards which may harm IT site personnel, the community, or the environment. The PM must be aware of these changing conditions and discuss them with the H&S Coordinator. The PM will keep contractors informed of the changing conditions. The H&S Coordinator will write addenda to change the Job Hazard Analysis and associated hazard controls as necessary.

3.1 Scope of Work

The scope of work is perform excavation and sampling activities at the L'Henri, Inc. site. Soils in the vicinity of soil boring SS1 will be excavated to depths of approximately 7 feet. The soil volume estimate to be removed is 1,575 cubic feet (ft³) approximately 15 feet (ft) by 15 ft by 7 ft. The excavation will be limited by safety considerations or physical limitations imposed by the nearby building. The excavated soil will be stockpiled within an envelope of 4 millimeter (mm) plastic sheeting surrounded by a locked security fence.

3.2 Job Hazard Assessment

3.2.1 Physical Hazards

Anticipated physical hazards of concern:

- Fall, trip, slip
- Heat (high ambient temperature)
- Ultraviolet radiation
- Noise
- Excavation hazards
- Heavy equipment
- Material handling.

The primary safety hazards for this project are associated with the excavation and operation of heavy equipment.

In addition to the primary safety hazards, work activities may pose additional physical hazards such as heat stress, sunburn and hearing impairment.

Heat Stress. Wearing personal protective equipment (PPE) may put site personnel at considerable risk of heat stress. Heat stress effects range from transient heat fatigue to serious illness and death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is fairly common during late spring, summer and fall, preventive measures and alertness to the symptoms are vital.

Heat stress monitoring should commence when personnel are wearing PPE, including Tyvek coveralls, and the ambient temperature exceeds 70 degrees Fahrenheit (°F). If impermeable garments are not worn, heat stress monitoring should commence at 85°F.

Ultraviolet Radiation. Field operations will be conducted in direct sunlight, which may result in sunburn. Lotions/creams that reduce the effects of the sun's rays are to be worn by employees performing activities at the site.

Excavation. The primary hazards of excavation activities for the purpose of sampling (i.e., test pit sampling) or remediation (i.e., removal of contaminated materials for subsequent disposal) include potential cave-ins due to heavy equipment operation or changing soil/weather conditions, slip/trip/fall hazards related to equipment handling and/or uneven or unstable surfaces, and excessive noise from on-site equipment.

Entry of personnel into site excavations presents additional potential hazards of confined-space entry. Potential hazards associated with confined-space entry include the following: the possible buildup of toxic, combustible, or oxygen-deficient/enriched atmospheres; uneven/slippery surfaces; the possibility of liquids or gases being admitted into the space during occupancy; or the physical isolation of the employee(s) when in need of rescue.

A detailed discussion of hazard control procedures for excavation safety and confined-space entry is presented in Section 4.2.1.

Material Handling. Field operations consist of the collection soil samples for subsequent analysis and collection of decontamination water in salvage drums. The physical hazards of these operations are not potentially serious; however, strains/sprains may result from improper body alignment or excessive lifting.

3.2.2 Chemical Hazards

The chemical hazards associated with sampling operations at the L'Henri, Inc (Table 1) are related to inhalation, ingestion, and skin contact with contaminated soils and water (see Section 1.2). The site-specific Material Safety Data Sheets (MSDS) are included in Appendix B.

Some analytical results from previous contaminant investigations are indicated below:

- Concentrations of PCE at SS1 were approximately 5.4 parts per million (ppm) at soil depths from 2.5 to 4.0 ft; 59 ppm at soil depths 4 to 6 ft; decreasing concentration as soil depth from 6 ft increased; and non-detected greater than 19 ft depth.
- Concentrations of PCE at SB11 were approximately 0.03 ppm at soil depths from 0 to 2 ft.
- Concentrations of PCE at SB13 were approximately 0.2 ppm at soil depths 4 to 6 ft.
- Concentrations of PCE at SB13A were approximately 0.02 ppm at soil depths 0 to 2 ft.

3.2.3 Noise

Noise exposure at or above the OSHA action level (85 decibels [dBA]) is likely during all excavation and heavy equipment operations. Exposure to noise levels in excess of 90 dBA, the OSHA permissible exposure limits (PEL) for noise, is likely during any excavation operations involving heavy equipment. A hearing conservation program is required for excavation projects.

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication; thereby, increasing the risk of accidents on site.

Table 1

Chemical Hazard Information
L'Henri

Contaminant (Synonym)	Physical/Chemical Characteristics (Target Organs/Route of Entry)	OSHA PEL (ppm)	ACGIH TLV (ppm)	IDLH (ppm)
Perchloroethylene (Tetrachloroethylene)	Colorless liquid with a mild, chloroform-like odor. Volatile, VP=14 mm. Noncombustible liquid. IP=9.32 eV. Animal carcinogen. Target organs include liver, kidneys, and central nervous system. Routes of entry are inhalation, absorption, ingestion, and skin contact. Symptoms of overexposure include nausea, vomiting, abdominal pain; tremor fingers; jaundice, enlarged tender liver; dermatitis; kidney damage.	25 ppm	25 ppm	500 ppm Animal Carcinogen
Trichloroethylene	Colorless liquid with a chloroform-like odor. Very volatile, VP=58 mm. IP=9.45 eV. Flammable liquid. Flashpoint 90°F, UEL=10.5%, LEL=8%. <u>Not</u> a suspected carcinogen, confirmed through numerous epidemiological studies. Target organs include respiratory system, heart, liver, kidneys, central nervous system, and skin. Routes of entry are inhalation, ingestion, and skin contact. Symptoms of overexposure include irritation of nose, eyes; central nervous system depression, liver, kidney damage.	50 ppm	50 ppm	1000 ppm
1,2-Dichloroethylene	Colorless liquid with a slightly acrid, chloroform-like odor. Extremely volatile, VP=180-264 mm. IP=9.65 eV. Flammable liquid. Flashpoint 36°F, UEL=12.-8%, LEL=5.6%. Target organs include respiratory system, eyes, and central nervous system. Routes of entry are inhalation, ingestion, and skin contact. Symptoms of overexposure include irritation of eyes, respiratory system; central nervous system depression.	200 ppm	200 ppm	4000 ppm

3.3 Anticipated Biological Hazards

3.3.1 Snakes

If sample collection locations are such that the possibility of encountering snakes exists, all personnel shall be cautioned to be alert to the presence of snakes. Should a snake bite occur, attempts should be made to kill the snake for positive identification. The victim should be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band, washing the area around the wound to remove any unabsorbed venom, and omit cutting and sucking (unless medical care cannot be obtained within 30 minutes). Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation, and effects from local release of substances by enzymatic actions. Other noticeable effects of snake bites include swelling, edema and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

3.3.2 Insects

All IT personnel should be aware of the potential presence of deer ticks during the months of April through October. Precautionary methods include familiarity with the signs/symptoms and potential health hazards of Lyme disease, and the proper implementation of appropriate work practices.

During the months of April through October, particular caution must be exercised to prevent being bitten by ticks and potentially contracting Lyme disease, Rocky Mountain Fever, and other tick borne diseases. Specific precautions include:

- Cover your body as much as possible. Wear long pants and long-sleeved shirts. Light color clothing makes spotting of ticks easier.
- Try to eliminate possible paths by which the deer tick may reach unprotected skin. For example, tuck bottoms of pants into socks or boots and sleeves into gloves. (Duct tape may be utilized to help seal cuffs and ankles.) If heavy concentrations of ticks or insects are anticipated or encountered, Tyvek coveralls may be utilized.
- Conduct periodic and frequent (e.g., hourly) surveys of your clothing for the presence of ticks. Remove any ticks/insects that become attached to clothing.

- Use insect/tick repellents that contain the chemical DEET (n,n-diethyltoluamide). Apply repellents in accordance with manufacturers' recommendations. These repellents are readily available and include such brands as Deep Woods OFF and Maximum Strength OFF. Check the ingredients of the repellent, as the higher the concentration of DEET, the longer the repellent will be effective.

IT field personnel should check with the PM to ensure use of insect repellents will not interfere with sample collection procedures.

3.3.3 Buried Sharp Objects

Although the potential biological hazards associated with this project are not anticipated to be significant, on-site personnel should be aware of potential bacterial/viral infections (e.g., tetanus) through ingestion following skin contact, or from puncture wounds sustained from stepping on or handling buried sharp objects.

3.3.4 Poisonous Plants

If sample points are located in areas where poisonous plants may be encountered, personnel should wear long pants, long sleeves, and gloves to minimize the possibility of exposure. In some areas, the use of a Tyvek or other protective suit may be advisable.

4.0 Safety Program and Procedures

The following work practices will be observed during all site activities.

4.1 General Practices

- At least one copy of this plan shall be available at the project site, in a location readily available to all IT personnel.
- As practical, IT personnel should practice contamination avoidance. All solid and liquid samples should be collected in such a manner as to minimize contact with the material.
- Contaminated protective equipment, such as respirators, hoses, boots, etc., shall not be removed from the area of potential contamination until it has been cleaned or properly packaged and labeled.
- Legible and understandable precautionary labels which comply with the hazard communication standard shall be affixed prominently to all containers of contaminated scrap, waste, debris, and clothing.
- Removal of contaminated solids from protective clothing or equipment by blowing, shaking, or any other means that disperse contaminants into the air is prohibited.
- No food or beverages shall be present or consumed in the regulated area.
- No tobacco products shall be present or used in the regulated area.
- Cosmetics shall not be applied within the regulated area.
- Contaminated materials shall be stored in tightly closed containers, in well-ventilated areas.
- Emergency equipment shall be located outside storage areas in readily accessible locations that will remain minimally contaminated in an emergency.
- All areas that have been determined as uncontaminated inside the regulated area will be clearly marked as such. No IT personnel, equipment, etc., shall be in these areas until they have been decontaminated.
- Ensure that no one is required to lift more than 60 pounds. Drums and containers shall be moved only with proper equipment, and shall be secured to prevent dropping or loss of control during transport.

- Operations shall be organized to minimize the amount of drum and container movement. Standing upon or working from drums or containers is prohibited. Only U.S. Department of Transportation (U.S. DOT)-approved drums or containers will be used onsite.
- All IT personnel on site shall use the buddy system (working in pairs or teams). If protective equipment or noise levels impair communications, then prearranged hand signals shall be used for communication. Visual contact shall be maintained between crew members at all times, and crew members must observe each other for signs of toxic exposure. Indication of adverse effects include, but are not limited to:
 - Changes in complexion and skin coloration
 - Changes in coordination
 - Changes in demeanor
 - Excessive salivation and pupillary response
 - Changes in speech pattern.
- Employees shall inform their partners or fellow team members of nonvisible effects of overexposure to toxic materials. The symptoms of such overexposure may include:
 - Headaches
 - Dizziness
 - Nausea
 - Blurred vision
 - Cramps
 - Irritation of eyes, skin, or respiratory tract.

4.2 Operating Procedures

4.2.1 Excavation Safety

IT Procedure HS307 for excavation and trenching found in Appendix C must be followed. No persons shall be allowed to enter into any excavation greater than 5 ft deep. If persons will enter excavations greater than 5 ft deep, the excavation must be shored, sloped, or otherwise made safe for entry. Personnel are urged to use remote sampling techniques whenever possible. When entry is unavoidable, the IT Procedure HS300 for confined-space entry found in Appendix D must be followed for each such activity.

Shoring or sloping system must be designed by a registered Professional Engineer (P.E.) licensed in the state in which the excavation will take place. The design must be present at the site, and the system must be installed as designed.

All excavation shall be performed from a stable ground position. Daily inspections of the excavation shall be made by a competent person, one who has received training in excavation safety. The inspector shall determine the likelihood of a cave-in, and remedial action (RA) such as sloping or shoring shall be taken if the walls appear to be unstable.

All spoil shall be located at least 2 ft from the edge of the excavation to prevent it from falling back into the excavation. The excavation shall be guarded on all sides by barricades or caution tape at least 2 ft from the edge.

All project personnel shall participate in the daily tailgate safety meetings and be instructed on the following requirements:

- Before excavating, the existence and location of underground pipe, electrical equipment, and gas lines will be determined. This will be done, if possible, by contacting the appropriate utility company and/or client representative to mark the location of the lines. If the client's knowledge of the area is incomplete, an appropriate device, such as a cable avoiding tool, will be used to locate the service line.
- No ignition sources are permitted if the ambient airborne concentration of flammable vapors exceeds 10 percent of the lower explosive limit (LEL) during the excavation. A combustible gas indicator will be used to make this determination.
- Operations must be suspended and the area vented if the airborne flammable concentration reaches 10 percent of the LEL in the area of an ignition source (i.e., sparks from bucket of excavator).
- Combustible gas reading of the general work area will be made regularly.
- If excavating equipment is located in the vicinity of overhead power lines, a distance of 15 ft must be maintained between the lines and any point on the equipment. If the lines have appreciable sag, or if windy conditions exist, this distance shall be 20 ft.

4.2.2 Confined-Space Entry

The collection of post excavation samples may require personnel to enter an excavation. IT personnel are urged to use remote sampling techniques whenever possible. When entry is unavoidable, the requirements as specified in Section 12 for confined-space entry must be followed for each such activity.

A confined space is defined as having limited means of egress due to location, size, or number of openings, and has unfavorable natural ventilation. Contaminated soil excavations may pose additional hazards such as air contamination, flammable or explosive atmosphere, and oxygen deficiency. IT has detailed training for confined-space entry, and only IT personnel properly trained shall supervise and participate in confined-space entry procedures.

All IT personnel entering a confined space shall be trained in proper procedures and the use of PPE. Only properly trained persons shall initiate confined-space entry procedures, perform tests on confined spaces, and authorize entry. The procedures for such entry are:

- The confined space must be isolated to prevent the introduction of contaminants during entry.
- Mechanical ventilation may be necessary to purge the space of vapors and ensure sufficient oxygen supply.
- The confined space shall be tested prior to entry. Tests shall be performed to determine the level of oxygen, flammable vapors, and toxic contaminants. Tests shall be repeated as often as necessary to ensure the safety of personnel entering the confined space.
- No entry shall be occur in a space where conditions are immediately dangerous to life and health (IDLH). Examples are oxygen less than 20 percent, greater than 10 percent LEL.
- Proper protective clothing and respiratory protective equipment shall be used for confined-space entry (Chapter 5).
- IT personnel entry into any excavation 5 ft deep or greater is only permitted if the walls are properly shored or sloped. A ladder shall be provided and placed at an angle not more than 30 degrees from vertical, and secured as necessary. Ladder side rails shall extend at least 3 ft above the ground surface.

4.3 Heat Illness Prevention

4.3.1 Heat Stress

One or more of the following control measures can be used to help control heat stress and are mandatory if any IT worker has a heart rate (measure immediately prior to rest period) in excess of 110 beats per minute:

- IT workers will be encouraged to drink plenty of water throughout the day. They will be advised to slightly increase their salt intake by lightly salting their food.
- On-site drinking water will be kept cool (50 to 60°F) to encourage IT personnel to drink frequently.
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All IT personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices such as vortex tubes or cooling vests should be used when IT personnel must wear impermeable clothing in conditions of extreme heat.
- IT employees should be instructed to monitor themselves and coworkers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- IT employees shall not be assigned to other tasks during breaks.
- IT employees shall remove impermeable garments during rest periods. This includes white Tyvek-type garments.
- All IT employees shall be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

The signs of heat stress disorders are given below.

Heat Cramps. Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat Exhaustion. Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness, nausea
- Fainting.

Heat Stroke. Heat stroke is the most serious form of heat stress and should always be treated as a medical emergency. The body's temperature regulation system fails, and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious death or injury occurs. Signs and symptoms of heat stroke include:

- Red, hot, usually dry skin
- Lack of, or reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse and confusion
- Coma.

4.4 Hearing Conservation

All on-site IT personnel shall wear hearing protection, with a Noise Reduction Rating (NRR) of at least 20, when noise levels exceed 85 dBA. All IT personnel who may be exposed to noise shall also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Chapter 8.0.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, wherever possible, barriers, or increased distance will be used to minimize worker exposure to noise.

4.5 Sanitation

4.5.1 Potable Water

The following rules apply for all project field operations:

- An adequate supply of potable water will be provided at each work site.
- Portable containers used to dispense drinking water shall be capable of being tightly closed, and shall be equipped with a tap dispenser. Water shall not be drunk directly from the container.
- Containers used for drinking water shall be clearly marked and not used for any other purpose
- Disposable cups will be supplied; both a sanitary container for unused cups and a receptacle for disposing of used cups shall be provided.

4.5.2 Non-potable Water

Outlets for non-potable water shall be identified to clearly indicate that the water is unsafe and is not to be used for drinking, washing, or cooking purposes. There shall be no cross connection (open or potential) between potable and nonpotable water systems. Non-potable and potable water systems shall be separated so as to minimize confusion and possible cross contamination.

4.5.3 Toilet Facilities

Toilet facilities shall be available for employees as follows:

Number of Employees	Minimum Number of Facilities
20 or fewer	One
More than 20, fewer than 200	One toilet seat and one urinal
More than 200	One toilet seat and one urinal per 40 employees

If permanent toilet facilities are not available (at sites more than 500 ft from a building with an accessible toilet), then a portable chemical toilet(s) will be provided.

4.5.4 Trash Collection

Trash collected from the contamination reduction zone (CRZ) will be separated as routine hazardous waste. Trash collected in the support and break areas will be disposed of as nonhazardous waste. Labeled trash receptacles will be set up in the CRZ and in the support zone.

5.0 Personal Protective Equipment

Based upon the job hazard analysis, it is expected that IT personnel will utilize Level D protective clothing for excavation of the first 4 ft if air monitoring results do not exceed the action levels specified in Table 2. Level C will be worn by IT personnel in the immediate vicinity where air monitoring readings are above the action level. Level C or Level B protective clothing may be required for entry into excavations or other operations depending upon the levels of contaminants as measured at the time of entry. It is anticipated that ventilation of any confined spaces will result in atmospheres with no hazardous levels of contaminants. If conditions warrant higher levels of protection, site work will be suspended until such conditions can be rectified.

When working at the site, IT personnel must wear ultraviolet radiation protective lotions/creams to prevent sunburn.

5.1 Levels of Protection

5.1.1 Level D

The minimum level of protective equipment to be worn on site during this project is:

- Hard hat, American National Standards Institute (ANSI) approved
- Safety glasses, ANSI approved
- Steel-toed boots or shoes, ANSI approved

If noise levels exceed 85 dBA, then hearing protection with a U.S. EPA NRR of at least 20 dBA shall be used.

5.1.2 Level C

Level C protection may only be used when contaminants can be evaluated or controlled, oxygen is at least 20 percent, and LEL is less than 10 percent. Level C protection for this project will consist of the following:

- Hard hat, ANSI approved
- Safety glasses, ANSI approved
- NIOSH-approved, full-face air purifying respirator with NIOSH-approved cartridges for dust and organic vapors
- Steel-toed neoprene boots or overbooties
- Nitrile gloves

Table 2**PPE Selection Matrix
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Airborne Contaminant Action Levels		
Parameter	Reading Above Background	Required Action
Flammable vapors (LEL)	<10% LEL	Normal operations
	≥10% LEL	Stop work; ventilate area; investigate source of vapors
Total Hydrocarbons	<5 ppm	Normal operations
	5 to 50 ppm	Stop work; don Level C PPE
	≥50 ppm	Stop work; evacuate area; investigate cause of reading

- Double polyethylene coated Tyvek hooded coveralls
- Full tape of ankles, wrists, and hood

5.1.3 Level B

Level B protection will be used for all work where atmospheres contain contaminants in excess of 10 times the permissible exposure limit (PEL) or for confined space entry. Level B protection for this project will consist of the following:

- Hard hat, ANSI approved
- Safety glasses, ANSI approved
- NIOSH-approved positive pressure air supply respirator system such as air line or self-contained breathing apparatus (SCBA)
- Steel-toed neoprene boots (ANSI approved) or overboots
- Nitrile gloves
- Double polyethylene coated Tyvek hooded coveralls
- Full tape of ankles, wrists, and hood

5.2 Respiratory Protection Program

The IT respiratory protection program will apply to all activities requiring the use of respirators at the site. Basic requirements are as follows:

- All IT site personnel will have an assigned respirator face piece.
- All IT site personnel will have been medically qualified, fit tested, and qualified in the use of the appropriate respirator within the past 12 months. Fit test and respirator qualification cards must be provided to the Site Supervisor prior to commencing site work.
- Only properly cleaned, maintained, NIOSH-approved respirators are to be used on this site.
- If air-purifying respirators are used, the respirator cartridge is to be disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is required.
- All IT site personnel will be clean shaven in facial areas which touch the sealing surface of the respirator.
- Respirators will be inspected; a positive and negative pressure test will be performed prior to each use.

- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag.

5.3 Using Personal Protective Equipment

Depending upon the level of protection selected for this project, specific donning and doffing procedures may or may not be required. The following procedures are mandatory if Level C or higher PPE is selected.

All IT persons entering the EZ shall put on the required PPE in accordance with the requirements of this plan. When leaving the EZ, PPE will be removed in accordance with the procedures listed, in order to minimize the spread of contamination.

5.3.1 Donning Procedures

These procedures are mandatory, only if Level C or higher PPE is required for the project:

- Remove bulky outerwear. Remove street clothes and store in clean location.
- Put on disposable or IT issue (and laundered) work clothes or coveralls.
- Put on the required chemical protective coveralls or rain gear.
- Put on chemical protective boots or boot covers.
- Tape the legs of the coveralls to the boots with duct tape.
- Put on chemical protective gloves as required by the H&S plan.
- Tape the wrists of the protective coveralls to the gloves.
- Don respirator if required, and perform appropriate fit check.
- Put hood or head covering over head and respirator straps. Tape the hood to the face of the respirator.
- Don remaining PPE, such as safety glasses or goggles and hard hat.

If these procedures are instituted, one person shall remain outside the work area to ensure that each person entering has the proper protective equipment. No persons shall be allowed to enter an EZ if they are not wearing the required PPE.

5.3.2 Doffing Procedures

The following procedures are only mandatory if Level C or higher PPE is required for this project. Whenever a IT person leaves a Level C or higher work site, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers.
- Clean reusable protective equipment.
- Remove protective garments, equipment, and respirator. All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels.
- Wash face and neck.
- Proceed to clean area and dress in clean clothing.
- Clean and disinfect respirator for next use.
- Proceed to the sign-out point.

All disposable equipment, garments, and PPE shall be bagged in two 6 mil plastic bags, properly labeled for disposal.

5.4 Selection Matrix

The level of personal protection selected will be based upon real-time air monitoring of the work environment and an assessment by the Site Supervisor of the potential for skin contact with contaminated materials. The PPE selection matrix is given in Table 2.

6.0 Site Control

Only IT personnel who have completed 40 hours of hazardous waste operations as defined under OSHA Regulation 29 CFR 1910.120, have completed their 40-hour training or refresher training within the past 12 months, and have been certified as fit for hazardous waste operations by a physician within the past 12 months shall be allowed within a site area designated as the work zone. IT personnel without such training may not enter the designated work zone. The Site Supervisor will maintain a list of authorized IT persons.

6.1 Hazard Briefing

No IT person will be allowed on any IT field sites during site operations without first being given a site hazard briefing. In general, the briefing will consist of a review of the tailgate safety meeting. All IT persons on the site, including visitors, must sign the site-specific tailgate safety meeting form.

6.2 Documentation of Certification

A training and medical file will be established for the project and kept on site during all site operations. The 40-hour training, update, and specialty training (first-aid/cardiopulmonary resuscitation [CPR]) certificates, as well as the current annual medical clearance for all project field personnel, will be maintained within that file. All IT personnel must provide their training and medical documentation to the Site Supervisor prior to the start of field work.

6.3 Entry Log

The IT representative at the site shall record on their Field Activity Daily Log (FADL) all visitors to the site. The log will be incorporated into the project file.

6.4 Entry Requirements

In addition to the entry requirements listed above, no IT personnel will be allowed on any IT field site unless they are wearing the minimum PPE as described in Chapter 5.0. IT personnel entering the work zone must wear the required PPE for those locations.

7.0 Decontamination

Contamination control will be maintained in the immediate work area where there is a potential for chemical contaminants to escape to the immediate environment. This control may consist of several techniques that will prevent loss of contamination control. Techniques include establishing a plastic- or paper-covered laydown area adjacent to the sampling point, wearing of PPE, establishing a control boundary by using rope or tape, and implementing other techniques that are readily recognized by client procedures.

7.1 Personnel Decontamination

Once clear of the area, the IT workers should wash exposed skin surfaces (e.g., hands and face) with soap and water to remove any contaminants.

7.2 Equipment Decontamination

Any equipment which have been utilized in contaminated areas will be decontaminated prior to leaving the work zone. If the level of contamination anticipated is low, decontamination for vehicles will be limited to rinsing of tires with water. For sites with significant levels of contamination, steam cleaning or pressure washing of vehicles and equipment will be required.

7.3 Personal Protective Equipment Decontamination

Where and whenever possible, single use, external protective clothing shall be used for work within the EZ or contamination reduction zone (CRZ). This protective clothing shall be disposed of in marked containers. Depending upon subsequent analysis, that protective clothing may require disposal as hazardous waste.

Reusable protective clothing will be rinsed at the site with detergent and water. The rinsate will be collected for possible disposal as hazardous waste.

Respiratory protective equipment will be wiped with a damp cloth while in the CRZ and bagged. Once the respirator has been removed from the CRZ, it will be thoroughly cleaned with soap and water. The respirator face piece will be cleaned at the end of each work shift.

8.0 Site Monitoring

8.1 Air Monitoring

Air monitoring is essential to ensure that all field IT personnel are adequately protected from airborne contaminants. The levels of organic vapors in the work area will be monitored using a total organics vapors monitoring unit (HNU) PI-101 photoionization analyzer, or equivalent.

Combustible gas readings shall be conducted in the areas of sampling or excavating if flammable contaminants are anticipated.

Integrated air samples, if collected, will be analyzed through an IT industrial hygiene (IH) laboratory and/or other equally accredited American Industrial Hygiene Association (AIHA) laboratories. The specific number of samples and turnaround times will vary and are dependent upon operation requirements and site-specific activities.

8.1.1 Locations to be Monitored

All personal, integrated air monitoring samples and direct reading instrumentation readings taken for the purpose of determining appropriate H&S precautions shall be collected/taken in the approximate "breathing zone" of the IT employees (i.e., readings should be taken at the approximate head-height of the IT employee closest to the sample location or other suspected source of contamination).

If integrated air samples are to be collected, the H&S Representative will be responsible for selecting appropriate individuals anticipated to be at highest risk for potential inhalation of airborne contaminants. All area, integrated air monitoring samples shall be taken from a fixed position at the approximate "breathing zone" height. The H&S Representative shall be responsible for the specific location of these sampling devices, based on prevailing environmental and site conditions and site activities.

8.1.2 Frequency

Continuous or intermittent area monitoring will be required for this project during intrusive work activities (if intermittent, at least every half-hour during intrusive activities). The monitoring equipment will be positioned at approximately "breathing zone" height to estimate personnel exposure. Readings shall be collected where employees are located near the

excavation and recorded on the IT real-time air monitoring log, Field Activity Daily log form, or equivalent to document potential employee exposures.

If used, personal, integrated air monitoring samples shall be collected during the first full day of site remediation/sampling operations. The H&S Representative in consultation with the Site Supervisor will be responsible for identifying a day that is anticipated to be indicative of proposed continued operations for the specific site. All samples should be full-shift samples (i.e., collected over at least six hours during the course of site operations) and analyzed within a 24- to 48-hour period. Based on these initial results, the frequency of additional sample collection and analysis will be determined, and the appropriate level of personal protection will be prescribed.

8.1.3 Air Monitoring Equipment

The following equipment will be available for utilization if required:

- HNU Model PI-101 photoionization detector (PID), or equivalent
- Method of standard addition (MSA) combustible gas and oxygen indicator, or equivalent

All equipment shall be maintained in such quantity and condition to adequately monitor and assess all site operations.

8.1.4 Monitoring Equipment Maintenance and Calibration

All IT HNU PIDs will be calibrated in accordance with manufacturer's specifications. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturers' procedures.

All other IT air monitoring equipment (e.g., combustible gas/oxygen meters and aerosol monitors) will be maintained and calibrated in accordance with the specific manufacturers' procedures.

All personal sampling pumps shall be calibrated in accordance with OSHA sampling protocols and NIOSH methods for the analyte of interest.

All direct reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. All air monitoring equipment calibrations and maintenance activities shall be documented on the IT field activity daily log

(FADL), or equivalent. All completed H&S documentation/forms shall be reviewed by the Project H&S Coordinator and maintained by the Site Supervisor.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the IT H&S Representative shall be responsible for immediately removing the instrument from service and obtaining a replacement unit. The specific IT operation for which this equipment is essential shall cease until an appropriate replacement unit is obtained. The H&S Representative will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

When applicable, only manufacturer-trained and/or authorized IT personnel will be allowed to perform instrument repairs or preventive maintenance (e.g., repairs on the hydrogen handling or electrical components of an organic vapor analyzer [OVA]).

8.2 Noise Monitoring

Noise monitoring is not anticipated on this project, however it may be performed if noise levels in the speech-interfering level are encountered.

8.3 Heat Stress

Heat stress monitoring shall be initiated whenever ambient temperatures on site exceed 85°F. At the discretion of the Project H&S Coordinator, environmental and/or physiologic monitoring will be carried out. Monitoring and interpretation of monitoring results will be in accordance with IT Procedure HS400, "Working in Hot Environments," and Section 4.0 of this plan.

8.4 Safety Review

The Site Supervisor will conduct frequent site safety inspections (no less than once per week). Management safety reviews will be recorded on Safety Inspection Report Forms and will be forwarded to the responsible business unit management for review. The Site Supervisor will record the inspection results on the Safety Inspection Report.

8.5 Monitoring Records

The PM shall ensure that site monitoring records are complete and incorporated into the project file. Any personnel or area air monitoring results will be incorporated into the host office H&S files. The host office H&S Coordinator will be responsible for establishing,

maintaining, and forwarding to other IT offices (as necessary) all required monitoring information as described below for placement in individual employee files:

- Employee name, social security number, payroll number
- The date, time, pertinent task information, exposure information
- Description of the analytical methods, equipment used, and calibration data
- Type of PPE worn
- Engineering controls used to reduce exposure.

8.6 Notification

Within five working days after receipt of monitoring results, the project H&S staff and the host office H&S staff will ensure that each employee is informed in writing of the results which represent that employee's exposure. Monitoring results representative of an employee's exposure shall be reported to the affected employee on the IT Employee Notification of Industrial Hygiene Monitoring Results Form.

Whenever the results indicate that the representative employee exposure exceeds the PEL, the Employee Notification of Industrial Hygiene Monitoring Results Form shall state that the PEL was exceeded, and shall provide a description of the corrective action taken to reduce exposure to a level below the PEL.

Table 3

Calibration and Maintenance of Field Sampling Equipment

Monitor Type	Calibration Method	Calibration Frequency	Maintenance Schedule
Combustible gas indicator/oxygen meter	CGI sensor calibrated against known concentration of hexane (demonstration bottle). Zero setting checked in noncontaminated air. Oxygen sensor calibrated daily to 20.8 percent in fresh noncontaminated air.	CGI span calibrated once per month. CGI zero checked daily. Oxygen sensor calibrated daily.	Instrument cleaned as needed and no less than annually. Oxygen sensor changed annually. CGI sensor checked annually and changed if necessary.
Photoionization detector (PID)	PID zeroed in clean air. Span calibrated using known concentration of isobutylene (demonstration bottle).	PID zeroed and span checked daily at start of work day.	Annual cleaning by qualified representative. Annual calibration of electronics by qualified representative. Clean lamp if sensitivity drops or if used in very dusty environment.
Draeger tube sampling system	Check air tightness of pump by inserting unbroken tube. Compress bellows pump, time for one minute, chain should remain slack. If chain taut, then maintenance required.	Check daily prior to start of workday.	Maintenance required whenever pump fails to pass leak test. Replace seals and/or lubricate per instruction manual.
Air sampling pump	Verify airflow using primary standard (bubble meter) or precalibrated rotameter.	Verify airflow prior to and after use, with sampling head in place. Spot check flow rate throughout sampling period.	Minimum of annual cleaning. Clean whenever pump unable to hold flow rate. Maintenance required if pump will not hold charge or if flow rate is erratic.
Sound level meter	Calibrate using known noise source (manufacturer supplied acoustic calibrator). Check battery level within recommended limits.	Calibrate meter and check battery daily prior to use.	Annual cleaning by qualified representative. Maintenance required if meter fails to calibrate.

9.0 Employee Training

9.1 General

All on-site IT personnel shall have completed at least 40 hours of hazardous waste operations-related training, as required by OSHA Regulation 29 CFR 1910.120. All IT field employees receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Those IT personnel who completed the 40-hour training more than 12 months prior to the start of the project shall have completed an 8-hour refresher course within the past 12 months. The Site Supervisor shall have completed an additional 8 hours of relevant H&S training and shall have a current first-aid/CPR certificate.

IT provides each employee who completes the required 40 hours of classroom training and 3 days of field experience with a certificate signed by the instructor. A copy of the certificate is maintained in the employee's home business unit training files. Subcontractors must provide certificates of training for the project file for all employees assigned to the project.

9.1.1 Tailgate Safety Meetings

Prior to the start of the project, all IT personnel will participate in a tailgate safety meeting. During the tailgate safety meeting, the H&S plan will be discussed. The Site Supervisor will ensure that the anticipated site hazards are summarized and explained to all IT personnel, and that those IT personnel are aware of the precautions they must take to minimize their exposure to those hazards. Tailgate safety meetings will be held at the start of each work shift. All new IT employees must attend the meeting and be familiar with this H&S Plan.

Attendance records and meeting notes are maintained with the project files.

9.1.2 Material Safety Data Sheets

The site-specific H&S plan includes MSDS and occupational health guidelines for chemical substances known to be on site. The H&S plan is maintained on site and is accessible to all site employees. Each employee is required to review and sign the H&S plan before starting work on the site. Refer to Appendix B.

9.1.3 Site-Specific Health and Safety Plan

The IT safety department prepares a site-specific H&S plan for each project falling within the scope and application of 29 CFR 1910.120 and IT Procedure HS052. Injury and illness prevention programs are written for all other projects. The Site Supervisor presents the H&S plan and discusses it with all personnel assigned to the project. All workers and visitors must read and sign the H&S plan acknowledging acceptance of site rules and understanding of site hazards before the start of the site work.

9.2 Site Workers' Basic Course

The following is a list of the topics covered in IT's 40-hour training course:

- General site safety
- Physical hazards (fall protection, noise, heat stress, cold stress)
- Names and titles of key personnel responsible for site H&S
- Safety, health, and other hazards typically present at hazardous waste sites
- Use of PPE
- Work practices by which employees can minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards
- Worker right-to-know (Hazard Communication OSHA 1910.1200)
- Routes of exposure to contaminants
- Engineering controls and safe work practices
- Components of the site H&S program
- Decontamination practices for personnel and equipment
- Confined-space entry procedures
- Emergency response plan.

9.3 Supervisors' Course Content

Management and supervisors must receive an additional eight hours of training presented by the IT Training Department that includes:

- General site safety and health programs
- PPE programs
- Air monitoring techniques.

9.4 Site-Specific Training

Site-specific training will be accomplished through a review of this H&S plan and the daily tailgate safety meetings.

9.5 First Aid and Cardiopulmonary Resuscitation

At least one employee current in first aid/cardiopulmonary resuscitation (CPR) will be assigned to the work crew and will be on the site whenever operations are ongoing. First-aid and CPR training courses are offered to all IT employees. Annual refresher training in first aid and CPR is required to maintain the currency of the certificate.

9.6 Instructors

The IT Training Department, headquartered in Irvine, California, teaches the 40-hour hazardous waste operations classes using Certified Environmental Trainers (CET). When training needs exceed the capacity of the training division, IT uses outside institutions. IT is recognized by the U.S. EPA and listed in the Federal Register (53 FR 3982). Only similarly recognized outside training institutions may be used with prior approval of the IT Training Department.

10.0 Medical Surveillance Program

10.1 Physical Examinations

All on-site IT personnel shall within the past 12 months have completed a comprehensive medical examination that meets the requirements of OSHA's Regulation 29 CFR 1910.120. The annual medical includes the following elements:

- Medical and occupational history questionnaire
- Physical examination
- Complete blood count, with differential
- Liver enzyme profile
- Chest X-ray, once every three years, for non-asbestos workers
- Pulmonary function test
- Audiogram
- Electrocardiogram (EKG) for persons older than 35 years of age, or if indicated during the physical examination
- Drug screening
- Visual acuity
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

All IT employee medical records are maintained by the H&S group, within the worker's home profit center. The examining physician provides the employee with a letter summarizing his findings and recommendations. Each employee also has the right to inspect and copy medical records.

The examining physician provides the employer with a letter confirming the worker's fitness for work and ability to wear a respirator. A copy of this letter for all project workers will be kept on site during all project site work.

10.1.1 Preplacement Examination

All employees will receive a preplacement medical examination prior to assignment to field operations.

10.1.2 Annual Examination

Each year subsequent to the placement examination, all IT employees must undergo an annual examination similar in scope to the placement examination. IT employees hired prior to 1985 are not required to submit to drug screening. Chest X-rays are taken every third year. The medical and occupational history is updated with each examination.

10.1.3 Exit Examination

IT employees receive an exit examination upon leaving the company if they have not been examined within the previous six months. The exit examination consists of the annual examination without drug screen. The employee's immediate supervisor is to notify the home office H&S Assistant within a reasonable time before the termination to allow for the necessary arrangements.

10.2 First-Aid and Medical Treatment

All IT persons on site must report any near-miss incident, accident, injury, or illness to their immediate supervisor or the Field Supervisor. First aid will be provided by the designated site first aider. Injuries and illnesses requiring medical treatment will be accompanied by an "Authorization for Treatment" Form. The IT employee's supervisor or the Field Supervisor will complete the "Supervisor's Employee Injury Report" and conduct an accident investigation as soon as emergency conditions no longer exist and first-aid and/or medical treatment has been rendered. The investigation should follow the Accident/Injury Investigation Report. These two reports must be completed and submitted to the H&S Coordinator within 24 hours after the incident.

If first-aid treatment is required, first-aid kits are kept at the CRZ and in all IT vehicles. If treatment beyond first aid is required, the injured should be transported to the medical facility shown in Appendix D. If the injured is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.3 Medical Restriction

When a medical care provider identifies a need to restrict work activity, the employee's home office H&S Assistant will communicate the restriction to the employee, their supervisor, and the office H&S professional. The terms of the restriction will be discussed with the employee and his supervisor. Every attempt will be made to keep the employee working, while not violating the terms of the medical restriction.

10.4 Medical Records

Medical and personal exposure monitoring records will be maintained according to the requirements of 29 CFR 1910.20 and HS103, and shall be kept for 30 years post employment. Employee confidentiality shall be maintained. Employees and their authorized representatives have access to these records through the H&S Assistant.

11.0 Emergency Response Plan

This H&S plan has been developed to allow the operation to be conducted without adverse impact to the H&S of project personnel, other personnel, and the environment. Supplementary procedures are included in this section to address extraordinary conditions that might occur at the site.

11.1 General

The Site Supervisor will establish evacuation routes and assembly areas for each site. All IT personnel entering the site will be informed of these routes and assembly areas. If the site is large and the evacuation routes not clear, a site plan will be made marking the evacuation routes and will be posted at conspicuous locations.

Each site will be evaluated for the potential for fire, explosion, chemical release, or other catastrophic events. Unusual events, activities, chemicals, and conditions will be reported to the Site Supervisor.

11.2 Emergency Procedures

If an incident occurs, the following procedures will be used:

- The Site Supervisor will evaluate the incident and assess the need for assistance
- The Site Supervisor will call for outside assistance as needed
- The Site Supervisor will act as liaison between outside agencies and on-site personnel
- The Site Supervisor will ensure the Project Manager and an H&S Representative at the nearest IT office are notified promptly of the incident
- The Site Supervisor will take appropriate measures to stabilize the incident scene.

11.3 Safety Signals

Vehicle or portable air horns will be used for safety signals as follows:

- One long blast: Emergency evacuation of the site
- Two short blasts: Clear working area around powered or moving equipment.

11.4 Medical Emergency

All IT employee injuries must be promptly reported to the Site Supervisor. The Site Supervisor will:

- Ensure that the injured IT employee receives prompt first aid and medical attention
- Ensure that the PM and General Manager are promptly notified of the incident
- Initiate an investigation of the incident.

11.4.1 Chemical Inhalation

Any IT employee complaining of symptoms of chemical overexposure as described in Chapter 3.0 will be removed from the work area and transported to the designated medical facility for examination and treatment. It is highly unlikely that the chemicals anticipated as being on site, in the concentrations anticipated, would cause situations immediately dangerous to life and health.

11.4.2 Eye Contact

IT project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the contaminated zone, shall immediately proceed to the eyewash station, set up in the decontamination zone. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

11.4.3 Skin Contact

IT project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the decontamination zone, to the wash-up area. IT personnel will remove any contaminated clothing, and then wash the affected area with water for at least 15 minutes. The worker should be transported to the medical facility listed below, if they show any sign of skin reddening, irritation, or if they request a medical examination.

11.4.4 Personal Injury Accident

In the event of an IT personal injury accident, the Site Supervisor will assess the nature and seriousness of the injury. In the case of serious or life-threatening injuries, normal decontamination procedures may be ignored. Less serious injuries such as strains, sprains, minor cuts, and contusions may only be treated after the employee has been decontaminated.

Following decontamination, an IT project team member qualified in first aid and CPR will administer suitable first aid. The Site Supervisor will then, if necessary, arrange transport to the appropriate medical facility.

11.5 Fire

In the case of a fire on the site, the Site Supervisor will assess the situation and direct fire-fighting activities. The Site Supervisor will ensure that the client site representative (if there is one) is immediately notified of any fires. IT personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. IT will call the local fire department (911) in the event of a fire that IT is unable to safely and immediately extinguish.

11.6 Emergency Information

Prior to the start of the project, contact will be made with local authorities and emergency services to establish communication channel during an event of emergency and to familiarize the project personnel with the communication procedure and services.

11.6.1 Public Agencies

Fire	921
Ambulance	922
Hospital	766-8311
Toxic Chemical & Oil Spill Reports	(800)424-8802
Water & Power Authority Emergency	773-2250

11.6.2 Key Project and IT Personnel

Project Manager, Belinda Price	(615)690-3211
H&S Coordinator, Melissa Smith	(615)690-3211
Site Supervisor	(615)690-3211

Occupational Physician:

Peter M. Greaney, M.D.
Greaney Medical Group
1103 S. Anaheim Boulevard
Anaheim, CA 92805
(714) 535-8221

David Barnes, M.D.
Environmental Medicine Resources, Inc.
4360 Chamblee Dunwoody Road
Suite 202
Atlanta, GA 30341
(404) 455-0818

12.0 Confined Space Entry

12.1 Introduction

This section contains the requirements and procedures for working in confined spaces. A confined space is defined as a space large enough and so configured that an employee can bodily enter and perform assigned work, has limited means for entry or exit, and is not designed for continuous employee occupancy. Contaminated soil excavations, storage vessel entries and other confined space work may pose additional hazards such as air contamination, flammable or explosive atmosphere, and oxygen deficiency. Excavation entry may pose the possibility of engulfment. IT has detailed training for confined space entry, and only personnel properly trained shall supervise and participate in confined space entry procedures or serve as standby attendants.

All confined spaces are initially considered permit required. Under certain conditions, a space may be reclassified as a non permit confined space provided the IT H&S Professional approves the reclassification, and the space meets the criteria outlined in Section X.2.3.

12.2 Confined Space Identification and Designation

12.2.1 Identification

The IT Supervisor is responsible to identify all confined spaces into which IT employees will enter. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space. The client is responsible to identify and provide information as to contents, expected atmosphere, and rescue procedures for all confined spaces on his/her property. If a space is not considered permit required by the client but meets the criteria of this procedure, it shall be considered permit required for IT managed entry. If a space does not meet the criteria in this procedure but is considered permit required by the client, this procedure shall apply.

The confined space for this project is **any entry into the excavation greater than 5 ft depth.**

12.2.2 Classification

A confined space means a space that is large enough and so configured that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for human occupancy.

A permit required confined space is a confined space meeting the above definition and also contains or could contain a hazardous atmosphere, or contains a material that has the potential for engulfing an entrant, or has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or contains any other recognized serious safety or health hazard. All confined spaces are initially considered permit required confined spaces.

CLASSIFY CS as permit-required confined space.

12.2.3 Reclassification

Although all confined spaces are initially considered permit required confined spaces, certain spaces can be reclassified as a non permit confined spaces provided the following apply:

- Site-specific approval of an H&S professional;
- All contaminants, vessels containing contaminants, and contaminated soils have been removed;
- All actual or potential atmospheric hazards have been eliminated (verified by testing);
- Ventilation is not required to maintain control of atmospheric hazards;
- All recognized hazards, including engulfment, within the confined space have been eliminated
- The entry permit must be posted at the entrance to the confined space.

The space must be re-evaluated (and reclassified to permit required, if needed) whenever the use or configuration of the space changes in any way that might increase the hazard to entrants. All IT entrants must exit the space immediately when hazards are noted.

RECLASSIFICATION IS NOT PERMISSIBLE FOR EXCAVATION ENTRY.

12.3 Duties of IT Personnel

Each confined space being entered shall have a minimum of one (1) dedicated attendant and one other support person (who may have other duties) within sight or call.

12.3.1 Duties of IT Entrants

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space.
- Alert the attendant whenever:
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation
 - The entrant detects a prohibited condition
- Exit from the permit space as quickly as possible whenever:
 - An order to evacuate is given by the attendant or the entry supervisor,
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation
 - The entrant detects a prohibited condition
 - An evacuation alarm is activated.

12.3.2 Duties of IT Attendants

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Is aware of possible behavioral effects of hazard exposure in authorized entrants.
- Continuously maintains an accurate count of authorized entrants in the permit space and accurately identifies who is in the permit space by tagging the lifelines with the entrant's name, and recording the names of the entrants.
- Remains outside the permit space during entry operations until relieved by another attendant.

- Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.
- Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - If the attendant detects a prohibited condition
 - If the attendant detects the behavioral effects of hazard exposure in an authorized entrants
 - If the attendant detects a situation outside the space that could endanger the authorized entrants
 - If the attendant cannot effectively and safely perform all his duties.
- Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - Warn the unauthorized persons that they must stay away from the permit space
 - Advise the unauthorized persons that they must exit immediately if they have entered the permit space
 - Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.
- Performs non-entry rescues.
- Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

12.3.3 Duties of IT Entry Supervisors

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures

and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

- Terminates the entry and cancels the permit as required.
- Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations.
- Determines that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.
- Documents on the entry permit any incidents or circumstances requiring review of the confined space entry program. Such incidents include:
 - Unauthorized entry
 - The detection of a condition/hazard not authorized by the permit
 - The occurrence of an injury or near-miss during entry
 - A change in use or configuration of the space
 - Employee complaints about the program.
- Prescribes procedures for coordination of entry when personnel from multiple employers will work simultaneously.

12.4 Procedures for Permit Space Entry

12.4.1 Acceptable Entry Conditions

The conditions for entry into each space are as follows: **SPECIFY CONDITIONS FOR EACH SPACE.**

AIRBORNE CONTAMINANT ENTRY CONDITIONS AND ACTION LEVELS		
Parameter	Reading	Action/Level of Protection
Total Hydrocarbons	<5 parts per million (ppm)	Normal operations, Level D
	5 to 25 ppm	Stop work; upgrade to Level C, investigate cause of reading
	≥25 ppm	Stop work; evacuate confined space and upgrade to Level B; investigate cause of reading

Parameter	Reading	Action/Level of Protection
Flammable Vapors (LEL)	<10% LEL	Normal operations
	≥10% LEL	Stop work, evacuate confined space; ventilate area; investigate source of vapors
Oxygen	>20%, <23.5%	Normal operations
	<20%, >23.5%	Stop work, evacuate confined space, ventilate, re-sample

12.4.2 Isolation Requirements

The confined space must be isolated to prevent the introduction of contaminants during entry. Isolation must include disconnecting or installing slip blanks into all lines leading to the space.

To prevent injury from physical hazards within the space, lockout, tagout, tryout and return to service procedures (IT Pro HS315) must be implemented for potential sources of hazardous energy.

When isolation is not practical or possible (as in sewer entry) entry conditions must be continuously monitored.

ISOLATION IS NOT PRACTICAL SO CONTINUOUS AIR MONITORING WILL BE NECESSARY FOR CONFINED SPACE ENTRY.

12.4.3 Atmospheric Hazard Control

Atmospheric hazards must be eliminated or controlled to meet the requirements specified in Section X.4.1. If necessary the space shall be purged or inerted, then ventilated to the extent necessary to meet the criteria in Section X.4.1. Ventilation equipment may be needed to maintain these conditions.

VENTILATION EQUIPMENT SHALL BE USED TO ENSURE REDUCTION OF POTENTIAL FLAMMABLE VAPORS AND THAT SUFFICIENT OXYGEN WILL BE PRESENT.

12.4.4 Inspecting and Testing Procedures

12.4.4.1 Testing Equipment

The following equipment shall be available for testing each confined space:

- HNU Model P1-101 PID or equivalent
- MSA combustible gas and oxygen indicator, or equivalent

All equipment shall be maintained in such quantity and condition, per manufacturer recommendations, to adequately monitor and assess all confined space entries.

12.4.4.2 Testing Procedures

Procedures for inspecting, monitoring and testing the confined space to verify that acceptable conditions exist prior to and throughout the entry operation are as follows:

Permit required confined spaces shall be tested no less often than every hour during entry and whenever operations or conditions change.

- For confined spaces that cannot be completely isolated (i.e., sewers), continuous testing with real-time direct reading instruments shall be required.
- Priority for atmospheric hazard testing shall be oxygen, combustible gases, then toxic gases.

TESTING WILL BE CONDUCTED CONTINUOUSLY DURING EXCAVATION ENTRY FOR OXYGEN CONTENT, FLAMMABILITY, AND TOXICITY.

12.4.5 Communications

Provisions for continuous communication between entrants and attendants may consist of the standard system of lifeline "tugs" below, so long as the attendants continuously hold the lifelines in their hands. If this is not practical or possible, portable air horns must be provided to all entrants and attendants. The same code for rope tugs will be used for air horn blasts:

Lifeline "Tug" Signals or Air Horn Signals

- 1 Tug/Horn Blast = Are you OK?
- 2 Tugs/Horn Blast = Yes, I am OK.
- 3 Tugs/Horn Blast = Exit the confined space immediately.

If the lifeline tug system or the air horn system are not feasible, powered communication equipment with the appropriate National Electrical Code (NEC) rating shall be provided.

COMMUNICATIONS SYSTEM WILL BE WRITTEN AND REVIEWED AT EACH TAILGATE SAFETY MEETING PRIOR TO EXCAVATION ENTRY.

12.4.6 Personal Protective Equipment (see Section 5.0 for PPE requirements)

- Protective suits, boots, and gloves - including specifying the material of construction.
- Face, head, and foot protection.
- Specify chest or parachute harness with approved lifelines at least 1/2-inch in diameter and 2,000 pounds test. (NOTE: Wristlets may be used only when a harness presents a greater hazard to the employee and wristlets are the safest, most effective alternative). All lifelines shall be secured to a mechanical device or fixed point outside the confined space. Mechanical devices shall be used for all vertical entry permit spaces greater than five (5) ft deep.
- Respiratory protection.

12.4.7 Other Required Equipment

12.4.7.1 Lighting Equipment

Lighting and electrical shall be of the appropriate NEC rating. Rating should be Class I, Division I unless the space specifically meets other rating requirements.

12.4.7.2 Ingress and Egress Equipment

Protective barriers to be used to protect entrants from external pedestrian, vehicle or equipment hazards.

Detail Equipment

12.4.7.3 Rescue Equipment

All lifelines must be attached to a mechanical device or a fixed point outside the space such that a rescue can begin as soon as the rescuer becomes aware that a rescue is necessary. A mechanical device must be available to retrieve personnel from vertical type permit spaces more than 5 ft deep.

Detail Equipment

12.5 Permit System

Before entry is authorized, the Entry Supervisor shall complete and sign an Entry Permit (Attachment 3) to document that all pre-entry requirements have been met and that acceptable entry conditions exist. The complete permit shall be posted at the primary entrance to the confined space.

All Entry Permits are valid for a maximum of one (1) work shift, and shall be cancelled by the Entry Supervisor when the shift ends, confined space operations are complete, or whenever a prohibited condition arises in or near the space. All confined spaces shall be securely closed or barricaded whenever the entry permit is cancelled.

The IT Entry Permit (attached) must be completely executed and include all required information.

12.6 Emergency Procedures

IT shall provide rescue services unless the client has a qualified rescue team in-plant which is available to IT and has been informed of the hazards of the confined space to be entered.

12.6.1 Client Provided Emergency Rescue Services

When the client provides the emergency rescue services, the IT PM must verify that the emergency personnel have been informed of the potential hazards they may confront, and have had an opportunity to examine the space(s). The PM must also verify all necessary equipment is available, and MSDSs for potential contaminants are provided to the facility treating any injures/exposed entrants.

12.7 Training

12.7.1 General

Prior to assignment to confined space entry work, all employees shall receive training in the hazards of confined spaces, work practices to control these hazards, and duties to be performed. Employee proficiency shall be established by testing and/or practical demonstration.

The IT Training Department shall maintain training records to include employee name and signature, date of training, and signature of the trainer.

12.7.2 Requirements for Entrants, Attendants, Supervisors

Basic training requirements for entrants and attendants shall include Hazards & Protection (or equivalent) and IT Confined Space Entry (CSE) update training if H&P was received prior to 4/1/93.

Basic training for entry supervisors and personnel conducting atmospheric testing shall include Qualified Person (or equivalent) and IT CSE update training if QP was received before 4/1/93.

Equivalent training must be approved by the IT Training Department prior to assignment to entry duties.

Personnel assigned to attendant duties shall be trained in non-entry rescue procedures.

12.7.2 Requirements for Emergency Rescue Personnel

Personnel assigned to provide emergency entry and rescue services shall be trained annually in the proper use of personal protective and rescue equipment. Such training shall include a simulated rescue exercise at least once every 12 months. In addition, rescue personnel shall be trained in the hazards and proper work practices for handling blood or other potentially infectious materials, and comply with other IT procedure HS512 provisions.

**APPENDIX A
SUBCONTRACTOR CERTIFICATION**

**(This appendix does not apply for the
intended scope of work)**

APPENDIX B CHEMICAL INFORMATION

APPENDIX C EXCAVATION TRENCHING

APPENDIX D EXPOSURE CONTROL PLAN

APPENDIX E
SITE AND HOSPITAL LOCATION MAPS