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DRAFT SITE HEALTH AND SAFETY PLAN FOR GROUNDWATER REMEDIATION AT
LANDFILLS 4 AND 5 AT AIR FORCE PLANT 4 WITH TRANSMITTAL LETTER NAS FORT
WORTH TX
3/1/1993
INTERNATIONAL TECHNOLOGIES



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**NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS**

**ADMINISTRATIVE RECORD
COVER SHEET**

AR File Number 134



Draft Plan

**Site Health and Safety Plan
Groundwater Remediation of
Landfills 4 and 5 (Carswell)
Air Force Base Plant 4
Fort Worth, Texas**

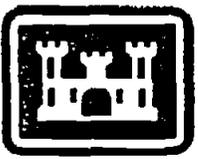
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4*

**Contract No. DACA56-92-D-0008
Delivery Order No. 0013**

*Hold
For
Now*

Prepared for:

**Department of the Army
Tulsa District, Corps of Engineers
Tulsa, Oklahoma**



Prepared by:

**IT Corporation
Monroeville, Pennsylvania**



INTERNATIONAL
TECHNOLOGY
CORPORATION

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March 18, 1993

305895-ITCHO-0003

Mr. Clif Warren, CESWT-EC-TRA
Department of the Army
Tulsa District, Corps of Engineers
224 South Boulder
Tulsa, Oklahoma 74121-0061

Contract: DACA56-92-D-0008, Delivery Order No. 0013

Subject: Submittal of Plans

Dear Mr. Warren:

In accordance with the requirements of the reference contract, IT Corporation (IT) is pleased to submit herewith three copies each of the Draft Site Health and Safety Plan for the Air force Plant 4 project.

Should you have any questions regarding this matter, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in cursive script that reads "Victor D. Dozzi".

Victor D. Dozzi, P.E.
Project Manager

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Site Health and Safety Plan
Groundwater Remediation of
Landfills 4 and 5 (Carswell)
Air Force Base Plant 4
Fort Worth, Texas

Contract No. DACA56-92-D-008
Delivery Order No. 0013

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Review and Approvals

Project Manager
IT Corporation

Date

H&S Manager
IT Corporation

Warren C. Houseman

3/16/93
Date

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**SITE HEALTH & SAFETY PLAN
ACKNOWLEDGMENT**

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

Printed Name/Employee Number

Signature

Date

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1.0 Introduction

1.1 Objective

This Health and Safety (H&S) Plan establishes the work practices necessary to help ensure protection of IT personnel and subcontractors during the Groundwater Remedial Action for Landfill No. 4 (LF04) and Landfill No. 5 (LF05) located on Carswell Air Force Base near Air Force Plant No. 4 (AFP4) in Fort Worth, Texas.

The objective of this plan is to provide a mechanism for the establishment of safe working conditions at the site. The safety organization and procedures have been established following an analysis of potential hazards at the site. Specific hazard control methodologies have been evaluated and selected in an effort to minimize the potential of accident or injury.

All site operations will be performed in accordance with applicable state, local and IT corporate regulations and procedures, Occupational Safety and Health Administration (OSHA) requirements, and Corps of Engineers regulations and procedures contained within EM385-1-1. All IT Corporation (IT) employees and subcontractors must comply with the requirements of this plan.

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1.2 Site/Facility Description

AFP4 is located in Tarrant County near the city of Fort Worth, Texas. This General Dynamics operated installation consists of 602 acres and is bordered on the south and west by the city of White Settlement, on the east by Carswell Air Force Base, and on the north by Lake Worth. IT's activities will be restricted to the areas around Landfill No. 4 and Landfill No. 5 (see Attachments A-3, A-4) located on Carswell Air Force Base.

Landfill No. 4 (LF04) is located east of Taxiway 197 and south of White Settlement Road. This is an approximate 10-acre area. There were six large pits in Landfill No. 4 which contained refuse that was burned and buried. Drums of liquid wastes, partially full paint cans, and cadmium batteries were reported being in Landfill No. 4.

Landfill No. 5 (LF05) is located northwest of LF04 on the flightline side (west) of the fence. LF05 was utilized to handle flightline wastes and refuse (oils, thinners, strippers, and paints). These wastes and refuse were burned and buried. There is a clay berm that runs beside the landfill along the creek.

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 prevention of injury and illness. Safety takes precedence over expediency or shortcuts. Every accident and every injury is avoidable and IT 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 by all site personnel. Operational changes which could affect the health or safety of personnel, the community, or the environment will not be made without prior approval of the IT Project Manager and the IT H&S Manager.

The provisions of this plan are mandatory to all IT personnel and subcontractors assigned to the project and all visitors to any work site are required to abide by these procedures. Work conditions can change as operations progress; therefore, the H&S Manager will provide written addenda to this H&S Plan when changes warrant. No changes to the plan will be implemented without prior approval of the H&S Manager or his authorized representative.

1.4 References

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

- Standard Operating Safety Guides (USEPA November 1984)
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH 85-115)
- Title 29 of the Code of Federal Regulations, Part 1910.120 (29 CFR 1910.120) (USDOL/OSHA)

- Safety and Health Requirements Manual EM385-1-1 (USACOE Revised October 1987).

Contents of this plan are consistent with the following IT H&S Policies and Procedures:

HS001	Safety Policy
HS020	Accident Prevention Program: Investigation and Review
HS021	Accident Prevention Program: Safety Inspections
HS022	Accident Prevention Program: Review of New Proposals, Projects, Operations, and Construction
HS023	Accident Prevention Program: Performance Recognition Program
HS051	Employee and Contractor Training Requirements
HS092	Reporting/Recording Occupational Injuries/Illnesses
HS102	Access to Employee Exposure and Medical Records
HS103	Maintenance of Employee Monitoring and Medical Records
HS300	Confined Spaces, Industrial
HS307	Excavation and Trenching
HS311	Emergency Response Operations
HS310	Hazardous Waste Operations at Uncontrolled Waste Sites
HS400	Working in Hot Environments
HS401	Cold Stress
HS051	Tailgate Safety Meetings
HS104	Employee Notification of Industrial Hygiene Monitoring Results
HS060	Hazard Communication Program
HS600	Personal Protective Equipment
HS601	Respiratory Protective Program
HS604	Electrical Safety
HS011	Health and Safety Rules For Contractors
HS402	Hearing Conservation Program
HS100	Medical Policies and Procedures
HS341	Hot Work in Hazardous Locations
HS305	Pressurized Systems
HS105	Occupational Injuries/Illness Procedures

These policies and their implementation are central to IT's accident prevention program.

2.0 Responsibilities

2.1 All Personnel

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 intent or

the inherent safety and environmental precautions expressed in these procedures. After due warnings, any person who violates safety procedures will be dismissed from the site. IT employees and subcontractors are subject to progressive discipline and may be terminated for continued violations. All on-site personnel will be trained in accordance with 29 CFR 1910.120 and this document.

2.2 Health & Safety Manager

The H&S Manager is responsible for developing and coordinating the site-specific H&S Plan and addenda as required. This plan complies with 29 CFR 1910.120 in all respects and includes medical surveillance and training requirements, hazard assessment, personnel protective equipment (PPE) specifications, field implementation procedures, and audits. The H&S Manager will issue addenda to the H&S Plan if changed conditions warrant. The H&S Manager is the contact for regulatory agencies on matters of safety and health. Other H&S Manager responsibilities include:

- General H&S program administration
- Determining the level of personnel protection required **F**
- Updating equipment or procedures based on information obtained during site operations **A**
- Establishing air monitoring parameters based on expected contaminants **R**
- Establishing employee exposure monitoring notification programs
- Investigating significant accidents and illnesses and implementing corrective action plans **D**
- Performing regular site inspections
- Developing site-specific employee/community emergency response plans as required based on expected hazards.

2.3 On-site H&S Coordinator

The on-site H&S Coordinator has the ultimate responsibility to stop any operation that threatens the health or safety of the team or surrounding populace or that causes significant adverse impact to the environment. Other responsibilities include but are not limited to:

- Implementing all safety procedures and operations on site
- Observing work party members for symptoms of on-site exposure or stress
- Upgrading or downgrading the levels of personal protection based upon site observations and monitoring results
- Informing the project H&S Manager of significant changes in the site environment that require equipment or procedure changes
- Arranging for the availability of on-site emergency medical care and first aid, as necessary.

2.4 Project Manager

The Project Manager is ultimately responsible for ensuring that all project activities are completed in accordance with requirements set forth in this plan.

2.5 Project Superintendent

The IT Project Superintendent supervises all IT activities at the site and is responsible for field implementation of the H&S Plan. This includes communicating site requirements to all personnel, ensuring field supervisors and subcontractors enforce all provisions of the plan, and consulting with the H&S Manager regarding changes to the H&S Plan. Other responsibilities include:

- Reading and becoming familiar with this H&S Plan and IT Policies and Procedures
- Enforcing the H&S Plan and other safety regulations
- Stopping work as required to ensure personal and environmental safety and health
- Determining evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation

- Ensuring that all site personnel and visitors have received the proper training and medical clearance prior to entering the site (See Section 6 of this plan.)
- Establishing exclusion, decontamination, and clean zones (See Section 7 of this plan.)
- Presenting tailgate safety meetings and maintaining attendance logs and records
- Assuring that the respiratory protection program is implemented (See Section 5 of this plan.)
- Assuring that decontamination procedures meet established criteria
- Assuring that there is a qualified first aid person on site
- Discussing potential H&S hazards with the H&S Manager and the Project Manager
- Implementing changes as directed by the H&S Manager and Project Manager.

2.6 Subcontractors

On-site subcontractors and their personnel are responsible for understanding and complying with all site requirements. Subcontractors are required to follow the guidelines established in IT's General Safety Rules for Contractors and this H&S Plan.

2.7 On-site Personnel and Visitors

All on-site personnel and visitors are required to comply with the provisions of this H&S Plan and all applicable federal, state, and local regulations. Each person is responsible for their own safety and health for completing tasks in a safe manner and for reporting any unsafe acts or conditions to his supervisor or the IT representative. Personnel will monitor themselves and their fellow employees for signs and symptoms of heat/cold stress and chemical exposure.

3.0 Job Hazard Analysis

3.1 Scope of Work

IT will extract and treat groundwater from the area around Landfills No. 4 and No. 5 on Carswell Air Force Base near AFP4. This will include the following tasks:

- Drilling and installation of monitoring/groundwater recovery wells
- Groundwater sampling
- Construction of groundwater treatment plant.

3.2 Job Hazard Assessment by Task

The Hazard Assessment 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 remediation projects, supervisors must continually inspect the work site to identify hazards which may harm site personnel, the community, or the environment. The Project Manager, Project Superintendent, Contractor Supervisor, and On-site Safety Coordinator must be aware of these changing conditions and discuss them with the H&S Manager. The H&S Manager will write addenda to change Job Safety Analyses and associated hazard controls as necessary.

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This site contains volatile organic compound (VOC) and chromium contaminated soil/groundwater which presents potential hazards to project personnel (see Table 4 of Attachment C). All IT personnel and subcontractors will be familiar with these hazards and strictly adhere to the appropriate safety procedures. The potential hazards and the appropriate controls will be presented to project personnel during daily tailgate safety meetings. A detailed activity hazard analysis for each task is included in Attachment D.

3.2.1 Task 1: Drilling and Installation of Monitoring/Groundwater Recovery Wells

IT will be drilling and installing monitoring/groundwater recovery wells in Landfills No. 4 and No. 5 on Carswell Air Force Base near AFP4.

Physical Hazards. Work involved with LF04 will take place on and around a golf course. This presents hazards of flying golf balls and the presence of non-IT personnel in the immediate area. Therefore, IT will barricade off the work area and restrict access to authorized personnel only. All on-site personnel must wear hard hats and eye protection at all times.

Physical Hazards. Physical hazards include those associated with the use of the drill rig and supporting vehicles. Physical hazards specific to drilling are listed below:

- **Slips.** Slips are toothed wedges positioned between the drill pipe and the master bushing/rotary table to suspend the drill string in the bore when it is not supported by the hoist. Most accidents associated with slip operations are related to manual materials handling. Strained backs and shoulders are common.
- **Tongs.** Tongs are large counterweighted wrenches used to break out the torqued couplings on drill pipe. Both sets of tongs have safety lines. When break out force is put on the tongs, the tongs or the safety lines could break and injure an employee standing close to them. Another likely accident can occur when the driller actuates the wrong tong lever and an unsecured tong swings across the rig floor at uncontrolled velocity. A common accident attributable to tongs can occur when an employee has his hand or finger in the wrong place as he attempts to swing and latch the tong onto the drill pipe, resulting in crushing injuries or amputation of the fingers.
- **Elevators.** Elevators are a set of clamps affixed to the bails on the swivel below the traveling block. They are used to clamp each side of a drill pipe and hold the pipe as it is pulled from the bore. Accidents and injuries can occur during the latching and unlatching tasks. Fingers and hands can get caught and crushed in the elevator latch mechanism. If the pipe is overhead when the latching mechanism fails, then the pipe may fall on employees working on the drill floor.
- **Cat Lines.** Cat lines are used on drilling rigs to hoist material and for driving sampling equipment. Accidents that occur during cat line operations may injure the employee doing the rigging as well as injure the operator. Minimal hoisting control causes sudden and erratic load movements which may result in hand and foot injuries.
- **Working Surfaces.** The rig floor is the working surface for most tasks performed in drilling operations. The surface is frequently wet from circulating fluid and/or the water used to wash it down. Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls.
- **Materials Handling.** The most common type of accident that occurs in materials handling is the "caught between" situation when a load is being handled and a finger or toe gets caught between two objects. Rolling stock can shift and/or fall from a pipe rack or truck bed.

In addition to the specific hazards listed above, rigs produce hazardous noise levels and accidents can occur as a result of improperly placing the rig on uneven or unstable surfaces or failing to adequately secure the rig before starting operations. See Section 4.4 for a discussion on general drilling practices.

Chemical Hazards. Chemical hazards associated with the drilling and well installation operation include the fuels and lubricants used with the drill rig and the VOC/chromium contaminated tailings. Sections 3.5 and 3.6 discuss the possible chemical hazards and their exposure standards.

3.2.2 Task 2: Groundwater Sampling

IT will collect and analyze three groundwater samples from the wells installed in LF04 and LF05 of Carswell Air Force Base. The samples will be analyzed off site for various organic, inorganic, and general chemical parameters.

Physical Hazards. The physical hazards involved in this task are related to the handling of groundwater.

Slip, trip, and fall hazards will be of concern during this task. Should the walking or working surfaces become wet extra caution must be taken to avoid slipping.

Noise is not expected to be a hazard during this operation, but if noise levels exceeding 85 db, the use of hearing protection will be required.

Splash hazards will be present during the sampling of wells. Employees will be made aware of this hazard and handle all groundwater with appropriate care. Splash shields will be used by all employees engaged in this activity.

Employees will follow proper lifting techniques when sampling wells. No one will be permitted to lift over 60 pounds without getting assistance.

Chemical Hazards. Inhalation of VOCs from groundwater wells may pose a potential hazard for exposure during this task. Skin absorption of VOCs from contact with

contaminated water also poses a risk. Sections 3.5 and 3.6 discuss possible chemical hazards and their exposure standards.

3.2.3 Task 3: Construction of Groundwater Treatment Plant

The subcontractor chosen to complete this task will be required to submit a hazard assessment of the work to be proposed. IT will review and approve this assessment and include it as an addendum to this plan.

3.2.4 Task 4: Digging Trenches and Installing Buried Pipelines and Electrical Lines

IT anticipates trenching will take place on the Golf Course and the shoulder of White Settlement Road. This work area will also be barricaded off to restrict public access and ensure a safe working environment for IT personnel. Personnel working in the areas will wear hardhats, safety glasses, and reflective vests for high visibility.

Physical Hazards. This phase of the work requires a combination of physical hands-on activities combined with some equipment operations. Employees must be alert for slip, trip, fall and cut hazards and beware of pinch points around moving parts of equipment.

All operators of equipment used onsite will be familiar with the requirements for inspection and operation of the equipment. Unfamiliar operations will be discussed with the affected employees before beginning work. The site supervisor will be responsible for checking the proficiency of the operators.

All underground utilities will be located prior to starting trenching activities.

Electrical lines will be connected by a qualified individual.

Employees will follow proper lifting techniques and no one will be permitted to lift over 60 pounds without obtaining assistance.

Noise presents a hazard. Mechanical equipment operation frequently results in noise levels exceeding 90 decibels (dB), requiring the use of hearing protection.

Fuel handling is another hazard present during this task. Refueling of mechanical equipment poses serious burn hazards.

Heat stress/cold stress is a potential concern and employees are cautioned to be aware of possible warnings of this condition.

Chemical Hazards. Inhalation of VOCs from trenching spoils may pose a potential hazard for exposure during this task. Skin absorption of VOCs from contact with contaminated trenching spoils also poses a risk. Sections 3.5 and 3.6 discuss possible chemical hazards and their exposure standards.

3.3 Heat Stress Signs and Symptoms

Wearing PPE places a hazardous waste site worker at considerable risk of heat stress. Heat stress effects range from transient heat fatigue to serious illness and death. Heat stress is caused by several interacting factors including environmental conditions, clothing, work load, and the individual characteristics of the worker. Because heat stress is the most common and potentially serious illness at hazardous waste sites, preventive measures and alertness to the signs and symptoms are vital.

Heat stress monitoring should begin when personnel are wearing PPE, including Tyvek coveralls, and the ambient temperature exceeds 78°F. If impermeable garments are not worn, heat stress monitoring should begin at 85°F. When ambient temperatures exceed 90°F and impermeable garments are worn, physiological monitoring will be implemented (see Section 4.2.1 Working in Hot Environments).

Heat Rash. Heat rash is caused by continual exposure to heat and humid air and is aggravated by chaffing clothes. Heat rash decreases a person's ability to tolerate heat as well as becoming an irritating nuisance.

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 including inadequate blood circulation due to cardiovascular insufficiency or dehydration.

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. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained immediately. This is a true medical emergency. Signs and symptoms are:

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

3.4 Signs and Symptoms of Cold Stress

Most cold-related worker fatalities have resulted from failure to escape low environmental air temperatures, or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a drop in the deep-core body temperature.

Employees should be protected from exposure to cold so that their deep-core body temperature does not fall below 36 degrees Celsius (°C) (equivalent to 98.6°F). A lower body temperature will very likely result in reduced mental alertness, reduction in rational decision-making, or loss of consciousness with the threat of fatal consequences.

Frostbite. Frostbite occurs when the extremities do not get sufficient heat from the central body stores. The fluids around the cells of the body tissues freeze from exposure to low temperatures. This condition can result in damage to, and loss of, tissue. The most vulnerable areas are the nose, cheeks, ears, fingers, and toes.

Damage from frostbite can occur in either the outer layers of skin, or in the tissue beneath these layers, and can be serious - resulting in scarring, tissue death, permanent loss of movement, or amputation.

There are degrees of frostbite:

- First degree: freezing without blistering or peeling
- Second degree: freezing with blistering or peeling
- Third degree: freezing with skin tissue death and possible deeper tissue damage.

Symptoms of frostbite include:

- Skin color changes to white or grayish-yellow, to reddish-violet and finally black as the tissue dies
- Pain may be felt at first, but subsides
- Coldness or numbness of the affected part.

Hypothermia. This is the most severe form of cold stress and results from a drop in the body's core temperature. The symptoms of hypothermia are:

- First, uncontrollable shivering and the sensation of cold
- Heartbeat slows and may become irregular
- Pulse weakens and the blood pressure changes
- As the body's core temperature drops, other signs may include cool skin, slow irregular breathing and apparent exhaustion
- When core temperatures are in the mid-range, the victim may become listless, confused, exhibit severe shivering, or develop severe pain in the extremities
- Final signs are a significant drop in blood pressure, fatigue, and shallow respiration.

3.5 Hazardous and Toxic Materials

This section discusses the hazards associated with materials that are used on the site or are likely to be found on the site. The H&S Manager will update this section as information

developed during this project warrants. The potential chemical hazards associated with this site are trichloroethylene, 2-hexanone, benzene, toluene, 1,2-dichloroethane, chloroform, xylene, chromium, and methylene chloride.

Analytical data from previous site investigations can be found in Table 4 of Attachment C.

Potential health effects including route of entry, symptoms of exposure, and relative toxicity can be found in Table 5 of Attachment C.

3.6 Exposure Standards

Threshold Limit Values (TLV) refer to airborne concentrations of substances which represent conditions that nearly all employees may be repeatedly exposed to day after day without adverse effect. These TLVs are prescribed by the American Conference of Governmental Industrial Hygienists (ACGIH) and are based upon the best available information obtained through industrial experience and animal or human studies. Because of the wide variation in individual susceptibility, a small percentage of workers may experience discomfort from some substances at concentrations below the recommended values. It has been policy to use these guidelines for good hygienic practices; however, whenever applicable, stricter guidelines may be utilized.

Currently, exposure guidelines for pesticides and other chemical substances are regulated by OSHA. These exposures are based upon the time-weighted average (TWA) concentration for a normal 8-hour workday and a 40-hour work week. Several chemical substances have short-term exposure limits or ceiling values which allow a maximum concentration to which workers can be exposed continuously for a short period of time without suffering from (1) irritation, (2) chronic or irreversible tissue damage, (3) narcosis of a sufficient degree to result in accidental injury, impaired self-rescue abilities, or substantially reduced work efficiency.

The short-term exposure limit (STEL) is defined by the ACGIH and OSHA as a 15-minute TWA exposure which should not be exceeded within a 2-hour time period during a workday even if the 8-hour TWA is within applicable limits. OSHA requires that a 15-minute "Ceiling" concentration never be exceeded for that chemical constituent. This notation appears as the letter "C" after the chemical name.

Under certain chemical substance listings, a "skin" notation may appear. This refers to the potential contribution to the overall exposure by the cutaneous route including mucous membranes, and eye, either airborne or by direct contact. Little quantitative data is available describing absorption as a function of the concentration to which the skin is exposed. Biological monitoring may be considered to determine the relative contribution of dermal exposure to the total dose.

The ACGIH and OSHA have recognized through epidemiological studies, toxicology studies and, to a lesser extent, case histories that certain chemical substances may have the potential to be carcinogenic in humans. Because of the long latency period for many carcinogens, it is often impossible to base timely risk management decisions on the results of such information. Two categories of carcinogens are designated based upon the most current literature and information. These include confirmed human carcinogens and suspected human carcinogens. These chemical categories are based on either:

- Limited epidemiologic evidence
- Demonstration of carcinogens in one or more animal species by appropriate methods.

The worker potentially exposed to a known human carcinogen must be properly equipped to ensure virtually no contact with the chemical constituents. In the case of a suspected human carcinogen, worker exposure by all routes must be carefully controlled by the use of personal and respiratory protection and through administrative or engineering controls.

Table 1 of Attachment C represents the strictest set of guidelines currently established by either the ACGIH or OSHA.

4.0 Hazard Control Program

The following procedures are mandatory for all IT and subcontractor personnel entering the exclusion zone. All site visitors entering exclusion zones (EZ) must follow these procedures. Personnel not following procedures will be warned and, if they refuse to follow these procedures, they will be escorted from the site.

4.1 General Practices

All information regarding work to be performed, emergency procedures, and H&S hazards will be reviewed before the work begins during a daily tailgate safety meeting. No work will be performed before this meeting has taken place. At least one copy of this plan will be available at the job work site.

Only authorized personnel will be permitted in the work area. These authorized individuals must have successfully completed a medical exam and have been properly trained in the use of respiratory protective equipment and specific H&S hazards. All visitors will check in with the IT representative.

All personnel entering the site will be thoroughly briefed on the hazards, equipment requirements, safety practices, emergency procedures, and communication methods.

Protective clothing and respiratory protective equipment will be used for various stages of the operation as needed. The level of protection will be specified in Section 5.2, and will depend upon the degree of hazard.

At least one person trained in a minimum of both American Red Cross first-aid techniques and cardiopulmonary resuscitation (CPR) will be on site whenever activities occur. As an alternative, this requirement is satisfied when a 911 emergency responder can respond within five minutes to the site.

No food, beverages, or tobacco products will be present, consumed, or used in contaminated areas or potentially contaminated areas. Taking medication, smoking, or applying cosmetics are also prohibited. These activities are allowed only in the established clean room and clean areas.

At the end of each work shift, before leaving the site, personnel who worked in contaminated zones will shower to remove any contamination.

Before eating, drinking, or smoking employees will wash their hands and remove outer protective garments.

Containers will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

Emergency equipment will be located in readily accessible uncontaminated locations. A complete first-aid kit and a fire extinguisher will be readily available on site for the team's use in the event of an emergency. The fire extinguisher will be located not more than 25 feet from the work activity. In addition, an eyewash will be readily available and must be capable of washing both eyes at once and delivering at least 0.4 gallons per minute for at least 15 minutes. At least one eyewash will be maintained in the contamination reduction zone (CRZ).

Employee entrance and exit routes will be planned and emergency escape routes designated.

All operators of equipment used on site will be familiar with the requirements for inspection and operation of such equipment. Unfamiliar operations will be discussed with affected employees before beginning work. The Project Superintendent will be responsible for checking the proficiency of the operator. Audio and/or visual backup alarms will be utilized on all heavy equipment on site.

Personnel will be prohibited from being transported by any means other than those prescribed for movement of personnel. When trucks or other heavy equipment enter or leave the site, an individual will direct the driver.

Only intrinsically safe electrical equipment will be permitted in areas where a flammable atmosphere may exist. All static ignition sources will be identified and eliminated by the use of bonding and grounding techniques.

Material Safety Data Sheets (MSDS) will be obtained for every chemical product used on site. This information will be made readily available to all employees upon request and stored in a central location. All containers of any chemical products will be properly labeled to comply with OSHA Hazard Communication Standard (29 CFR 1910.1200).

Work areas will be illuminated to a minimum of 20-foot candles. Supplementary lighting may be necessary inside buildings, tanks, at night, or in other poorly lit areas.

When working around heavy equipment or materials, employees and visitors will adhere to the following precautions:

- Hard hats must be worn at all times on the site.
- Pay attention at all times.
- Maintain visual contact at all times.
- Establish hand signal communication when verbal communication is difficult. Determine one person per work group to give hand signals to equipment operators.
- Be aware of footing at all times.
- All heavy equipment will have backup alarms of some type.
- Use chain hoists, straps, and any other equipment to safely aid in moving heavy materials.
- Use proper personal lifting techniques. Use your legs, not your back.
- Get help whenever you are in doubt about a material's weight.
- Never walk directly in back or to the side of heavy equipment without the operator's knowledge.
- Never walk underneath any suspended load and always look overhead when a crane is in use.
- Only qualified people are to operate heavy equipment.

4.1.1 Buddy System

All on-site personnel will use the buddy system. Buddies will maintain visual contact with each other. Personnel must observe each other for signs of heat stress or toxic exposure, such as:

- Changes in complexion and skin discoloration
- Changes in coordination or demeanor
- Excessive salivation and pupillary response
- Changes in speech pattern.

Personnel will inform their supervisor of nonvisual effects of toxic exposure such as:

- Headaches, dizziness, blurred vision
- Nausea
- Cramps
- Irritation of eyes, skin or respiratory tract.

4.1.2 Fall Protection

The walking and working surfaces may become wet and slippery during these tasks. Use extra caution when working on these surfaces. In addition, visible barriers will be erected around any open excavations to prevent personnel from falling into these areas.

Employees working at heights of 6 feet or greater will be protected from falls using appropriate fall protection measures (i.e. safety nets, safety belts, etc.).

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4.2 Project Specific Practices

To prevent personnel exposure to heat/cold stress during all tasks, the practices outlined in Sections 4.2.1 and 4.2.2 will be followed.

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The work area must be marked in such a way as to prevent traffic from passing within 10 feet of the work area. Cones, caution tape, barricades, or other means must be used to define the work area.

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All on-site personnel must wear steel toed safety shoes, hard hats, and safety glasses. Long pants or trousers and shirts covering the upper body and upper arms must also be worn.

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4.2.1 Working in Hot Environments

Heat Stress. Heat stress due to protective clothing decreasing body ventilation is an important factor. Heat stress of employees on site will be monitored by the American Red Cross method of monitoring heart rates and oral temperatures as personnel come out for rest and cooling off.

Ambient temperature and other environmental factors provide basic guidelines to implement work/rest periods. However, since individuals vary in their susceptibility to heat stress, IT

will also utilize physiological monitoring to regulate each individual's response to heat stress when ambient temperatures exceed 78°F. The two physiological parameters that each individual will monitor are:

- **Heart Rate** - Each individual will count his/her radial (wrist) pulse for 30 seconds as early as possible in the first rest period. If the heart rate of any individual in the sampling team exceeds 100 beats per minute at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same.
- **Oral temperature** - Each individual will measure his/her oral temperature with a single-use clinical thermometer for one minute as early as possible in the first rest period. If the oral temperature exceeds 99.6°F at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same.

One or more of the following control measures can be used to help control heat stress and are mandatory if heat stress is detected by elevated heart rate or oral temperature:

- Employees should drink plenty of water throughout the day and should increase their salt intake slightly by salting their food a little heavier.
- On-site drinking water will be kept cool (50-60°F) to encourage personnel to drink often.
- A work regimen that will provide adequate rest periods for cooling down will be established as required.
- All personnel will be advised of the dangers and symptoms of heat stroke and exhaustion.
- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments.
- Employees will be cautioned to monitor themselves and their co-workers for the effects of heat disorders and to take additional breaks as needed.
- All breaks are to be taken in a shaded rest area.
- Employees will not do other tasks during rest periods.
- Employees will remove impermeable garments during rest periods.

- All employees will be informed of the importance of adequate rest, acclimatization, and proper diet in the prevention of heat stress.

4.2.2 Working in Cold Environments

Cold Stress. One or more of the following control measures can be used to help control cold stress:

- Workers will be provided with warm clothing, such as mittens and heavy socks, when the air temperature is below 4 to 7°C (equivalent to 40 to 45°F)
- Protective clothing may be used to protect the employee when the air temperature is below 0 to 7°C (equivalent to 32 to 40°F). Depending on employee comfort, clothing for warmth in addition to protective clothing will be provided. This will include:
 - Insulated suits, such as whole-body thermal underwear
 - Wool or polypropylene socks to keep moisture off the feet if there is a potential of work activity which would cause sweating
 - Insulated gloves
 - Boots
- At air temperatures below 2°C (equivalent to 35°F), the following work practices must be observed:
 - If the clothing of the employee might become wet on the job site, the outer layer of the clothing must be impermeable to water.
 - If an employee's underclothing (socks, mittens, etc.) becomes wet in any way, the employee must change into dry clothing immediately. If the clothing becomes wet from sweating, the employee may finish the task which caused the sweating before changing into dry clothing.
 - Employees must be provided with a warm area, 18°C (equivalent to 65°F) or above, in which to change from work clothing into street clothing.

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4.3 Hearing Conservation

All on-site personnel will wear hearing protection (E.A.R. foam inserts or equivalent) when operating heavy equipment or whenever noise levels exceed 85 dB, according to IT Procedure HS402. All personnel required to wear hearing protection will receive baseline and an annual audiogram, and training on the causes and prevention of hearing loss.

4.4 Drilling Safety

Drill Crews. All drillers performing work must possess required state or local licenses to perform such work. All members of the drill crew must receive site-specific training prior to beginning work. The driller must be responsible for the safe operation of the drill rig as well as the crew's adherence to the requirements of this HASP. The driller must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the driller, wear all personnel protective equipment, and be aware of all hazards and control procedures. The drill crews must participate in the daily tailgate safety meeting and be aware of all emergency procedures. F

Rig Inspection. Each day, prior to the start of work, the drill rig and associated equipment must be inspected by the driller and/or drill crew. The following items must be inspected:

- Vehicle condition R
- Proper storage of equipment R
- Condition of all wire rope
- Fire extinguisher
- First aid kit. D

Rig Set Up. The drill rig must be properly blocked and levelled prior to raising the derrick. The wheels which remain on the ground must be chocked. The rig must be moved only after the derrick has been lowered. The levelling jacks must not be raised until the derrick is lowered.

Site drilling will comply with the following rules:

- Before drilling, 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 client representative to mark the location of the lines.

If the client's knowledge is incomplete, an appropriate device, such as the cable avoiding tool, will be used to locate service lines.

- If drilling is conducted in the vicinity of overhead power lines, a distance of 15 feet must be maintained between the lines and any point on the drill rig. If the lines have appreciable sag, or if windy conditions exist, this distance will be 20 feet.
- If lubrication fittings are not accessible with guards in place, machinery must be stopped before oiling and greasing. Fuel, hydraulic fluid, or oil will not be placed in the drill rig unless the engine has been turned off.
- Rigging material equipment for material handling must be checked prior to use on each shift and as often as necessary to ensure it is safe. Defective rigging must be removed from service immediately.
- Drillers will not add or remove pipe from the drill stem without the assistance of the driller's helper.
- If drill cuttings are to be drummed and moved to a central storage location, lifting and transporting of these drums should be completed using the appropriate equipment and following safe loading and unloading procedures.

4.4.1 Hoisting Operations

- Drillers must never engage the rotary clutch without watching the rotary table and ensuring it is clear of personnel and equipment.
- Unless the drawworks is equipped with an automatic feed control, the brake must not be left unattended without first being tied down.
- Casing or pipe must not be picked up suddenly.
- Drill pipe must not be hoisted until the driller is sure that the pipe is latched and the drilling assistant has signalled that he/she may safely hoist the load.
- During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller will be on the rig floor and no one will be on the rig or derrick.
- The brakes on the drawworks of every drilling rig must be tested by each driller at the beginning of each shift to determine whether they are in good order. The brakes must be thoroughly inspected by a competent individual each week.

- A hoisting line with a load imposed will not be permitted to be in direct contact with any derrick member or stationary equipment unless it has been specifically designed for line contact.
- Hoisting control stations must be kept clean and controls labelled as to their functions.

4.4.2 Riding Hoisting Equipment

Under no circumstances will personnel be permitted to ride the traveling block or elevators, nor will the cat line be used as a personnel carrier.

4.4.3 Cat Line Operations

- Only experienced workers will be allowed to operate the cathode controls. The kill switch must be clearly labelled and operational prior to operation of the cat line.
- The cathode area must be kept free of obstruction and entanglements.
- The operator will not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.
- Personnel must not stand near, step over, or go under a cable or cat line which is under tension.
- Employees rigging loads on cat lines must:
 - Keep out from under the load
 - Keep fingers and feet where they will not be crushed
 - Be sure to signal clearly when the load is being picked
 - Use standard visual signals only, and not depend on shouting to coworkers
 - Make sure that the load is properly rigged, since a sudden jerk in the cat line will shift or drop the load.

4.4.4 Pipe Handling

- Pipe must be loaded and unloaded, layer by layer, with the bottom layer pinned or blocked securely on all four corners. Each successive layer must be effectively blocked or chocked.
- Workers will not be permitted to top off the load during loading, unloading, or transferring or pipe or rolling stock.

- Employees must be instructed never to try to stop rolling pipe or casing; they must be instructed to stand clear of rolling pipe.
- When pipe is being hoisted, personnel will not stand where the bottom end of the pipe could whip and strike them.

4.5 Sanitation

IT employees will keep the work and support areas neat and orderly and free of trash and debris.

4.5.1 Break Area

An area will be established that is upwind from the work area and outside the contamination zone where personnel can take a break. The area must be clearly marked and no contaminated personnel or equipment is permitted there.

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4.5.2 Potable Water

If the facility does not have a water supply available, potable water will be carried to the site for use in decon and employee cleanup.

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4.5.3 Trash Collection

All refuse will be deposited into designated containers while on site. It is the responsibility of the Project Manager and the Project Superintendent to insure that the area is kept clean.

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4.6 Confined Space

Confined space entry is not expected to occur during this project, but if such activity does take place, IT Procedure HS300 along with OSHA and Corps of Engineers policies and regulations will be followed.

5.0 Personnel Protective Equipment (PPE)

The PPE outlined below has been selected according to the site characterization and analysis, job tasks, site hazards, intended use, and duration of potential employee exposures.

Maintenance and storage of PPE, decontamination, donning and doffing procedures, inspection and monitoring of effectiveness, and limitation are outlined in this section.

5.1 Respiratory Program

A comprehensive respiratory protection program has been established by IT and is required in all locations where use of such equipment is intended to lessen the potential for adverse health effects to any employee.

As part of the respiratory training program, each employee is instructed in the following elements:

- Nature of the respiratory hazard on the work site and the appraisal of potential consequences if the respiratory protection is not utilized
- Use and proper fitting of the respirator
- Cleaning, disinfecting, inspection, maintenance, and storage of the respirator
- Proper selection, capabilities, and their limitations.

Routinely used respiratory equipment will be inspected, cleaned, and disinfectd daily to help assure proper hygienic practices. An inspection of these breathing devices will include the following:

- Examination of the head straps for breaks, loss of elasticity, broken or malfunctioning buckles and other attachments
- Examination of the face-piece for excessive dirt, cracks, tears, distortion, holes, or inflexibility
- Examination of the exhalation and inhalation valves for any foreign material, cracks, tears, or distortion in the valve. Additional checks will be made to inspect for proper insertion, defective valve covers or improper installation
- Examination of air purifying elements for incorrect cartridge, expired shelf-life of the cartridge, cracks or dents in the cartridge or cartridge-holder
- Examination for proper insertion of the cartridges into the face-piece and a check of the gaskets inside the cartridge-holder
- Examination of air cylinders for adequate air volume. Only Grade D air will be utilized for breathing air.

When Level C protection is required, respiratory cartridges will be changed daily. All respirators will be inspected prior to each day's use. If broken or malfunctioning parts are found during the cleaning process, these parts will be replaced or new respiratory equipment will be issued to the user.

The respiratory protective equipment will be stored in an area protected from any mechanical damage. These devices will also be stored in a location that provides protection against dust, heat, excessive moisture, or damage by chemical contact. The storage area for the respirators should be in a readily accessible location.

- Only employees who have been trained to wear and maintain respirators properly will be allowed to use respiratory protection.
- Selection of respirators, as well as any decisions regarding upgrading or downgrading of respiratory protection, will be made by the H&S Manager or his designee.
- Positive and negative pressure tests will be performed each time the respirator is donned.
- Only employees who have been fit tested within the last 12 months will be allowed to work in atmospheres where respirators are required. Subcontractors will provide certificates of respirator fit test completed within the last 12 months for each employee on site.
- Respirator users will be instructed in the proper use and limitations of respirators.
- If an employee has difficulty in breathing during the fit test or during use, he will be evaluated medically to determine if he can wear a respirator safely while performing assigned tasks.
- No employee will be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the health or safety of the employee will be impaired by respirator use.
- Contact lenses will not be worn while using any type of respiratory protection.
- Air-supplied respirators will be assembled according to manufacturer's specifications. Hose length, couplings, valves, regulators, manifolds, and all accessories will meet ANSI and the manufacturer's requirements.

- Respirators will be cleaned and sanitized daily after use.
- Respirators will be stored in a convenient, clean, and sanitary location on site.
- Respirators will be inspected during cleaning. Worn or deteriorated parts will be replaced.
- Facial hair that might interfere with a good face-piece seal or proper operation of the respirator is prohibited.
- The IT Project Superintendent will review the respiratory protection program daily to ensure employees are properly wearing and maintaining their respirators and that the respiratory protection is adequately protecting the employees.
- The H&S Manager and the Project Manager will evaluate the respiratory protection program monthly to ensure its continuing effectiveness.
- Respirators used for emergency response will be inspected weekly by the H&S Coordinator.

5.2 Levels of Protection

The level of protection used in the EZ is based on site specific information. Specific levels of protection will be changed whenever site conditions change. They can either be increased to the next higher level or decreased to the next lower level. If the Project Superintendent requests a change in levels of protection, he must contact the IT H&S Manager and Project Manager. If the need arises to protect safety and health, the Project Superintendent can upgrade protection levels without input from the H&S Manager or Project Manager. He will then discuss the decision with the H&S Manager, H&S Coordinator, and the Project Manager when they are available. Levels of protection will not be downgraded without prior approval from the H&S Manager.

5.2.1 Level A Protection

Level A Protection is not required.

5.2.2 Level B Protection

Level B Protection is not expected to be required. Level B Protection will be required if airborne concentrations of toxic contaminants exceed the action levels established in Table 3 of Attachment C for Level C protection. The H&S Manager will be notified when the decision is made to upgrade to Level B.

5.2.3 Level C Protection

Level C protection will be required if airborne concentration of suspected contaminants exceed the action levels established in Table 3 of Attachment C for Level D protection.

The following equipment will be used for Level C protection:

- Full face, air purifying respirators with organic vapor cartridge in combination with high efficiency particulate air (HEPA) filter which are National Institute of Occupational Safety and Health/Mine Safety and Health Agency (NIOSH/MSHA) approved
- Hooded one piece suit, polyethylene coated Tyvek^F or equal, taped at gloves and boot covers
- Gloves (Outer) - chemical resistant PVC^A, neoprene, nitrile, or other impermeable material (If leather or canvas outer gloves are used, they will be disposed at the end of each shift.)
- Gloves (Inner) - chemical resistant^R (latex)
- Boots (Outer) - chemical resistant steel-toed boots, Neoprene, PVC, with or without booties (Disposable boot covers when working in or near contaminated soil, debris or dust make decontamination easier.)
- Hard hat
- Hearing protection (if necessary)
- Back support belt (if necessary).

5.2.4 Level D Protection

The minimal level of protection that will be required of IT personnel and subcontractors at the site will be Level D. Level D protection will be worn while digging trenches for the

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installation of buried pipelines and electrical lines, and during the installation of monitoring/groundwater recovery wells so long as airborne concentrations of toxic contaminants do not exceed the action levels established in Table 3 of Attachment C. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Boots/shoes - with steel toes, latex overboots if area is heavily contaminated
- Safety glasses or goggles
- Hard hat
- Chemical resistant nitrile or PVC protective gloves with surgical latex undergloves as necessary
- Hearing protection (if necessary)
- Back support belt (if necessary).

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5.2.5 Selection of PPE

The selection of the PPE will be done after a thorough evaluation of the hazards involved at the site during each phase of the operation. Table 2 of Attachment C describes the PPE required for each task and Table 3 describes the action levels for upgrading.

5.3 Using PPE

All persons entering the EZ will don the required PPE according to established procedures in this plan to minimize exposure potential. When leaving the EZ, PPE will be removed according to these established procedures to minimize the spread of contamination.

5.3.1 Donning Procedures

- Remove street clothes and store in a clean location
- Put on surgical scrubs or coveralls
- Put on boots and boot covers and tape the coveralls
- Put on gloves
- Tape the coveralls over the gloves at the wrist
- Don respirator and check for secure fit

- Put hood or head covering over the respirator
- Put on remaining protective equipment, i.e. hard hat, safety glasses, etc.

One person will remain outside the work area to check that each person entering has the proper protective equipment. No persons will be allowed to enter an EZ improperly attired.

5.3.2 Doffing Procedures

Whenever a person leaves the work site, the following proper decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated mud and debris from boots or remove boot covers.
- Clean reusable protective equipment.
- Remove protective garments and equipment. All disposable clothing should be placed in plastic bags and labeled as contaminated waste.
- Remove respirator.
- Proceed to the clean area and dress.
- Clean respirator and prepare for next use.
- Proceed to the sign out point.

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

5.4 Selection Matrix

The PPE required for each task is outlined in Table 2 of Attachment C.

6.0 Site Control

Site control requires establishing specific measures to prevent unauthorized entry onto the site and to protect all personnel entering the site from recognized safety and health hazards. The following measures are mandatory:

- Authorization to Enter

- Hazard Briefing
- Documentation of Certificates
- Entry Log
- Entry Requirements
- Emergency Entry and Exit.

6.1 Authorization to Enter

No IT employee or subcontractor will be admitted onto AFP4 without satisfactory proof of United States citizenship or without specific authorization from the Officer in Charge of construction.

The Project Manager and the Project Superintendent may grant authorization to enter the site. Access to contaminated work areas is regulated and limited to authorized personnel. Only those who have completed the required training and medical requirements will be allowed to enter. Representatives from regulatory agencies will be permitted to enter the site at any time during business hours or at other reasonable times, by appointment, to conduct official business provided they have completed the required training and medical requirements. Representatives of the news media and other visitors must receive authorization from the client and the IT General Manager before entry.

6.2 Hazard Briefing

The H&S Coordinator will brief this H&S Plan to all personnel entering the site to inform them of potential site H&S hazards and procedures specific to this site. All personnel will acknowledge this briefing by signing the H&S Plan. This briefing will be further documented in the site daily log.

6.3 Documentation of Certificates

Personnel entering the site to work will have satisfied the medical and training requirements of 29 CFR 1910.120. The project file will contain copies of certificates documenting status for all on-site personnel. Personnel not entering the EZs need not meet the above requirements. The Project Superintendent will accommodate requests from representatives of regulatory agencies to review documentation. All visitors must present documentation of current training and medical status before being granted authorization to enter the EZ.

6.4 Entry Log

The Project Superintendent keeps a daily roster of all on-site personnel and records the time of entry into and exit from the EZ for each person.

6.5 Entry Requirements

All personnel entering work or EZs will use the proper PPE. All personnel entering EZs will enter and exit through the decontamination units and observe the mandatory decontamination procedures.

6.6 Emergency Entry and Exit

During emergencies, decontamination will be conducted to the extent that is possible without endangering personnel. All persons responding, both on site and off site, will be informed of site safety and health hazards and health hazards associated with contaminated personnel.

7.0 Decontamination

7.1 Contamination Control Zones

The H&S Coordinator will establish contamination control zones for the project based on the location of contamination, drilling activities, accessibility, and site control. These zones must be clearly marked and defended against unauthorized entry.

7.1.1 Exclusion Zone (EZ)

An EZ is the area where contamination does or could occur during site activities. This zone has the highest potential for exposure to the contaminants by contact or inhalation. All employees will use proper personnel protective equipment when working in these areas. The EZ will be a defined area where there is a possible respiratory and/or contact health hazard. In most instances this area will be a 20-foot radius around the drill rig or other site activity. The location of the EZ will be identified by printed hazard tape or other appropriate means.

7.1.2 Contamination Reduction Zone (CRZ)

A CRZ will be established and decontamination will be performed in the CRZ. All personnel entering or leaving the EZ will pass through this area in order to prevent any cross-contamination and for the purpose of accountability. Tools and any equipment or machinery will be decontaminated in a specific location. The decontamination of all

personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and properly labeled.

7.1.3 Support Zone (SZ)

Support zones (SZ) are established in uncontaminated areas and are used for the storage of supplies and general administrative functions. The SZ will be located to prevent employees from being exposed to any organic vapors or dust levels above regulatory limits. Eating, drinking, or smoking will be permitted in the SZ only after washing face and hands.

Warnings signs or barrier tape will be affixed in readily visible locations to delineate the EZ, CRZ, and SZ.

7.2 Decontamination General Rules

- An area outside of the EZ will be designated as the break area. Employees will proceed through personal decontamination before eating, drinking, or smoking. No eating, drinking, or smoking will take place in the EZ.
- The H&S Coordinator will monitor the effectiveness of the decontamination procedures and, if ineffective, will take appropriate steps to correct any deficiencies or modify the plan as needed.
- Used coveralls, gloves, and overboots will be dropped into a bag-lined garbage can for disposal at an approved facility.
- Spent disposable respirator cartridges will be dropped into a bag-lined garbage can.
- Clean respirators, hard hats, goggles, and face shields will be placed on the work table at the clean end of the zone.
- Soiled boots, hard hats, respirators, and other equipment will be inspected daily, washed and scrubbed in a detergent/water solution. After cleaning, equipment will be rinsed thoroughly in water and allowed to dry on a clean surface.
- If there is a rip or tear in the employee's protective clothing, that individual will remove the torn garment in the decontamination area and new protective clothing will be issued in order for the employee to return back to work. The same procedure will apply to defective respiratory equipment.

7.3 Equipment Decontamination

The purpose of the CRZ is to limit the spread of contamination by contaminated personnel, tools, equipment, and materials from the EZ. Any person, tool, equipment, or material from inside the EZ will be considered contaminated and must be cleaned before leaving the work site. Decontamination of all large equipment will be performed on site (prior to personnel decontamination). Verification that all equipment has been properly decontaminated will be the responsibility of the site Project Superintendent and the H&S Coordinator. All contaminated solvents and waters generated from the cleaning operation will be collected and containerized for disposal.

Decontamination can be accomplished by any one, or combination, of the following methods:

- Contaminant removal: Water rinse, steam jet, leaching, or scrubbing
- Detoxification: Halogen stripping, neutralization, or thermal degradation
- Disinfection: Chemical, dry heat, gas/vapor or irradiation.

7.4 PPE Decontamination

At least one person will remain outside the work area to assist decontaminating personnel in the CRZ.

Whenever a person leaves the work site, the following proper decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated mud, etc. from boots or remove boot covers.
- Remove protective garments and equipment. All disposable clothing should be placed in plastic bags and labeled as contaminated waste.
- Reusable protective equipment must be cleaned at the job site.
- Remove respirator after contaminated outer wear has been removed and after showering.
- Proceed to the clean area and dress.
- Clean respirator and prepare for next use.
- Proceed to the sign out point.

All disposable equipment, garments, and PPE will be bagged in two 6 mil plastic bags and properly labeled for disposal at the job site.

7.5 Decontamination During Medical Emergencies

The IT On-site H&S Coordinator or emergency-care provider will quickly assess the extent of the injury or illnesses to determine if life-saving medical treatment is crucial or if the decontamination procedures will create additional injuries and aggravate the existing condition. Under such circumstances, decontamination procedures will be greatly modified, simplified, or eliminated completely.

Life threatening injuries will be attended to immediately. Respiratory equipment must be removed and outside garments can be removed or cut away if it does not cause delays in treatment or cause further injury to the individual. Care will be taken to minimize the spread of contamination to emergency response personnel and transport vehicle by placing towels, blankets, or plastic beneath the victim.

8.0 Site Monitoring

8.1 Air Monitoring

Measurements of airborne volatile organic compounds (VOC) will be conducted in the work area by using an HNu photo-ionization analyzer or equivalent to indicate exposure levels. VOCs will be monitored in the breathing zones of employees. Colormetric tubes will be used to assess the presence of benzene.

Measurements of oxygen and combustible gases will be made using a combination oxygen/combustible gas monitor.

All air monitoring equipment will be maintained and calibrated according to the manufacturer's recommendations. Calibration will be done before and after use each day. All work activity is prohibited in atmospheres where tests indicate the concentration of flammable vapors exceeds 10 percent of the LEL. Such an area will be ventilated to reduce the concentration to an acceptable level.

On-site personnel must wear monitoring equipment as instructed by the H&S Coordinator and refusal to wear monitoring equipment, or intentional tampering with sampling apparatus, will lead to immediate dismissal from the job site.

8.2 Other Hazardous Conditions

The H&S Coordinator will take affirmative action to limit exposures. If unknown chemicals or contamination are encountered, operations will cease until the situation is evaluated. The H&S Coordinator will contact the H&S Manager to evaluate any potentially hazardous situations, or any situation with elevated contamination levels. Operations will only be resumed if they can be accomplished in a safe manner.

8.3 Noise Monitoring

Noise monitoring will be conducted as required using a Quest 2400 noise meter or equivalent. Hearing protection is mandatory for all employees in noise hazardous areas or when operating heavy equipment.

8.4 Record Keeping

The On-Site H&S Coordinator or his designee will be responsible for establishing and maintaining records of all required monitoring as described below:

- Date, time, pertinent task information, exposure information
- Description of the analytical methods, equipment used, calibration data
- Type of PPE worn
- Engineering controls used to reduce exposure.

8.5 Notification

Employees who are exposed to hazardous and toxic materials at job sites will be notified of the results of the industrial hygiene monitoring conducted at the site in accordance with IT procedure HS104.

9.0 Employee Training

IT trains all field personnel according to 29 CFR 1910.120 before their initial assignment to any project. All field employees receive a minimum of 40 hours of training off site and a minimum of 3 days of actual field experience under the direct supervision of a trained, experience supervisor. Subcontractor personnel must meet the above training requirements.

Personnel, including subcontractors, whose activities are limited to nonhazardous activities within the work zone complete 24 hours of training off site and 8 hours of on-site training.

On-site management and supervisors receive a minimum of 8 hours of additional training on program supervision. Each hazardous waste operations employee receives 8 hours of refresher training annually.

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 with the project files and in the IT H&S Office. Subcontractors must provide certificates of training for the project file for all employees assigned to the project.

9.1 Pre-entry Briefings

The following training sessions and informational materials are provided at each project site:

- Tailgate Safety Meetings
- Material Safety Data Sheets (MSDS)
- H&S Plans.

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9.1.1 Tailgate Safety Meetings

The Project Superintendent conducts a tailgate safety meeting the beginning of each shift or whenever new employees arrive at the job site once the job commences. The topics discussed at the tailgate safety meeting include H&S considerations for the day's activities, necessary protective equipment, problems encountered, and new operations. Attendance records and meeting notes are maintained with the project files.

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9.1.2 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) will be obtained for every chemical product used on site. This information will be made readily available to all employees upon request and stored in a central location.

9.1.3 Health & Safety Plans

IT prepares a site specific H&S Plan for each project falling within the scope and application of 29 CFR 1910.120. The H&S Coordinator presents the H&S Plan and discusses it with

everybody 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 entering.

9.2 Site Workers Basic Course

Following is a general list of topics covered in the 40-hour course:

- General site safety
- Physical hazards (fall protection, noise, heat stress, cold stress)
- Names and titles of key personnel responsible for site safety and health
- Safety, health and other hazards present at the site
- Use of PPE
- Work practices by which employees can minimize risks from hazards
- Safe use of engineering controls and equipment ^T on site
- Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure ^F to hazards
- Worker Right-to-Know (Hazard ^A Communication)
- Routes of exposure ^R to on site contaminants
- Engineering controls and safe work practices
- ^D Components of the site H&S Program
- Decontamination practices for personnel and equipment
- Confined-space entry procedures
- Emergency Response Plan (ERP).

9.3 Supervisors Course

Management and supervisors receive an additional 8 hours of training which includes:

- General safety and health program
- PPE program

- Spill containment program
- Air monitoring techniques.

9.4 First Aid and CPR

Employees will receive instruction in Red Cross first aid and CPR techniques from qualified instructors.

9.5 Instructors

The IT Training Division, headquartered in Irvine, California, teaches the 40-hour classes using certified instructors. When training needs exceed the capacity of the Training Division, IT uses outside institutions. IT Training Division is recognized by USEPA and listed in the Federal Register (53 FR 3982). Only similarly recognized outside training institutions are used.

9.6 Site-Specific Training

All site personnel will be trained in excavation safety, if required. Training in confined-space entry is required only for those personnel entering a confined space. All confined-space entries will be authorized by the On-site H&S Coordinator.

10.0 Medical Surveillance

10.1 Medical Examination

As required by IT Policy and Procedure HS100, all personnel on site will have successfully completed a preplacement or periodic/updated physical examination.

10.1.1 Preplacement Exam

This examination has been designed to meet 29 CFR 1910.120 requirements for hazardous waste site operations.

The IT medical surveillance program examination consists of:

- Medical and occupational history questionnaire which includes information on past gastrointestinal, hematologic, renal cardiovascular, reproductive, immunological, and neurologic problems

- Physical examination
- Blood pressure measurements
- Complete blood count (CBC) and differential to include hemoglobin and hematocrit determinations, red cell indices, and smear of peripheral morphology
- Blood urea nitrogen and serum creatinine
- SMAC 24
- Chest x-ray
- Pulmonary function test
- Audiogram
- EKG for employees over 35 years old or when other complications indicate the necessity
- Drug and alcohol screening
- Visual acuity.

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The following information is provided to the examining physician:

- Description of employee's duties
- Anticipated chemical and asbestos exposure and levels
- Description of the PPE to be used
- Information from previous medical exams.

The medical surveillance provided to the employee includes a judgment by the medical examiner of the ability of the employee to use either positive- or negative-pressure respiratory equipment. Any employee found to have a medical condition which could directly or indirectly be aggravated by exposure to these chemical substances or by the use of respiratory equipment will not be employed for the project. A copy of the medical examination is provided at the employee's request.

The employee will be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites.

SITE HEALTH AND SAFETY PLAN

**GROUNDWATER REMEDIATION OF
LANDFILL NO. 4 AND NO. 5
CARSWELL AIR FORCE BASE
FORT WORTH, TEXAS**

PREPARED FOR:

**Department of the Army
Tulsa District, Corps of Engineers
Tulsa, Oklahoma**

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PREPARED BY:

**IT CORPORATION
2790 Mossdale Boulevard
Monroeville, Pennsylvania 15146**

**William A. Clawson
Health & Safety Coordinator**

March 1993

IT Project No. 305895

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician on the Certification Form (Attachment B). The physical examinations will meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134.

Subcontractors will supply copies of the medical examination certificate for each on-site employee.

10.1.2 Annual Exam

All IT employees receive an annual update exam meeting the requirements of 29 CFR 1910.120. The results of these exams are compared to previous results and the baseline physical to determine if any effects due to exposure have occurred. Appropriate actions are taken as recommended by the physician should the results indicate an exposure; otherwise, employees are cleared for continued work.

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10.1.3 Exit Exam

IT offers exit physical exams for all employees involved in the medical surveillance program who are leaving the company for any reason to ensure they are in good health.

10.2 First Aid and Medical Treatment

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Employees are trained in Red Cross first aid treatment skills and IT retains a local medical clinic for all of its offices. Employees have access to the clinic at any time during their working hours should an occupational injury or illness occur.

10.3 Medical Restriction

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Should an occupational injury or illness occur that restricts an employee's ability to function at full capacity, IT maintains a policy of providing these employees with light duty assignments whenever possible to allow them to continue to be productive.

10.4 Medical Records

Medical and personal exposure monitoring records will be maintained according to the requirements of 29 CFR 1910.20 and will kept for a minimum of 30 years. Employee confidentiality will be maintained.

11.0 Emergency Procedures

IT develops each H&S plan to allow hazardous waste operations to proceed without adverse impacts on the safety and health of the worker, the environment, and the community. In addition, supplementary ERPs have been developed to cover extraordinary conditions that might occur at various sites.

11.1 General

The Project Superintendent and H&S Coordinator will establish evacuation routes and assembly areas for the site. All personnel entering the site are informed of these routes and assembly areas. If the evacuation routes are not clear, a site plan will be prepared marking the evacuation routes and will be posted at conspicuous locations.

The Project Superintendent and H&S Coordinator will evaluate the site for the potential for fire, explosion, chemical release, or other catastrophic events. As part of the training, site workers are instructed to report unusual events, activities, chemicals, and conditions to the Project Superintendent.

11.2 Emergency Response

The objective of emergency response actions is to minimize adverse health risks to site workers, the environment, and the local community. The H&S Coordinator or the Project Superintendent will be the site emergency coordinator.

Responsibilities. The site emergency coordinator will have the responsibility for directing the response activity in the event of an emergency. The responsibilities are described below:

- Assess the emergency situation and notify site security personnel
- Determine the required response measures and inform the Client contact
- Notify the appropriate response teams of the specific action that will be taken upon request
- Determine and coordinate the on-site personnel actions for the particular emergency situation
- Contact and coordinate with appropriate governmental or regulatory agency

- Act as liaison between responding agencies and site personnel
- Immediately complete the Supervisor Injury Report form upon occurrence of an accident or incident
- The emergency coordinator will notify the Project Manager and the H&S Coordinator of any incident.

The emergency coordinator has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

11.3 Safety Signals

Vehicle, tractor, and portable gas-operated horns are used for safety signals as follows:

- 1 Long Blast: Warning alarm - prepare for Emergency Response
- 2 Short Blasts: Activation alarm - initiate Emergency Response activities as directed by Emergency Coordinator
- 3 Short Blasts: All clear - return to normal activities.

11.4 Medical Emergency

Emergency medical personnel will be summoned without delay in the event of a medical emergency. The emergency coordinator will stay on the line with the 911 Operator until the 911 Operator hangs up.

Worker Injury If a person working in an area is physically injured, American Red Cross first-aid procedures will be followed. Depending upon the severity of the injury or illness, emergency medical response may be obtained accordingly. If the person can be moved, that person will be taken to a location where emergency first aid treatment can be administered. The local emergency medical facility should be contacted along with an ambulance.

If the injury to the worker is of chemical nature, the following first-aid procedures will be instituted as soon as possible:

- Eye Exposure - If contaminated material gets into the eyes, the eyes will be flushed immediately at the eyewash station using copious amounts of water while lifting up the lower and upper eyelids.

- Skin Exposure - If contaminated sludge or corrosive liquid material gets on the skin, the affected area will be washed with soap or mild detergent.
- Inhalation - If an individual inhales a volume of toxic or corrosive vapors, the employee will be removed to fresh air at once. If breathing has stopped, artificial respiration will be performed on the affected individual until medical attention can arrive on scene and transport the patient to the nearest medial facility.
- Ingestion - In the event a person ingests a toxic liquid or solid material, medical attention will be obtained at once.

11.5 Reporting Injuries and Illnesses

Employees will report all injuries to their supervisor immediately and report illnesses as soon as the employee knows he/she is sick. Supervisors will submit completed "Supervisor's Report of Injury" to the IT H&S Department within 24 hours of the occurrence. If there is any indication that the illness is work-related, the supervisor will submit a completed "Supervisor's Report of Injury" to H&S Department within 24 hours after notification by the employee.

11.6 Emergency Information

11.6.1 Public Agencies

- FIRE*
 - General Dynamics Fire Department (817) 777-2174
 - White Settlement Fire Department (817) 246-1761
- POLICE*
 - General Dynamics Police Department (817) 777-4522
 - White Settlement Police Department (817) 246-7070

- HOSPITAL/ Robert L. Thompson Hospital (817) 782-4000
Osteopathic Medical Center of Texas (817) 731-4311
Emergency (817) 735-3100

AMBULANCE* 911

*White Settlement Police and Fire will respond to a 911 call.

Hospital location map (See Attachment A-2).

11.6.2 Key IT Personnel

<u>Position</u>	<u>Name</u>	<u>Contact Phone Number</u>
IT Program Manager	Glenn Schwartz	(412) 372-7701
IT Project Manager	Victor Dozzi	(412) 858-3960
IT Program H&S Manager	Warren Houseman	(412) 372-7701

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11.6.3 Key USACOE Personnel

<u>Position</u>	<u>Name</u>	<u>Contact Phone Number</u>
Chief Safety Officer	Bob Vandergriff	(918) 581-7316
Industrial Hygienist	Greg Snider	(918) 581-6101

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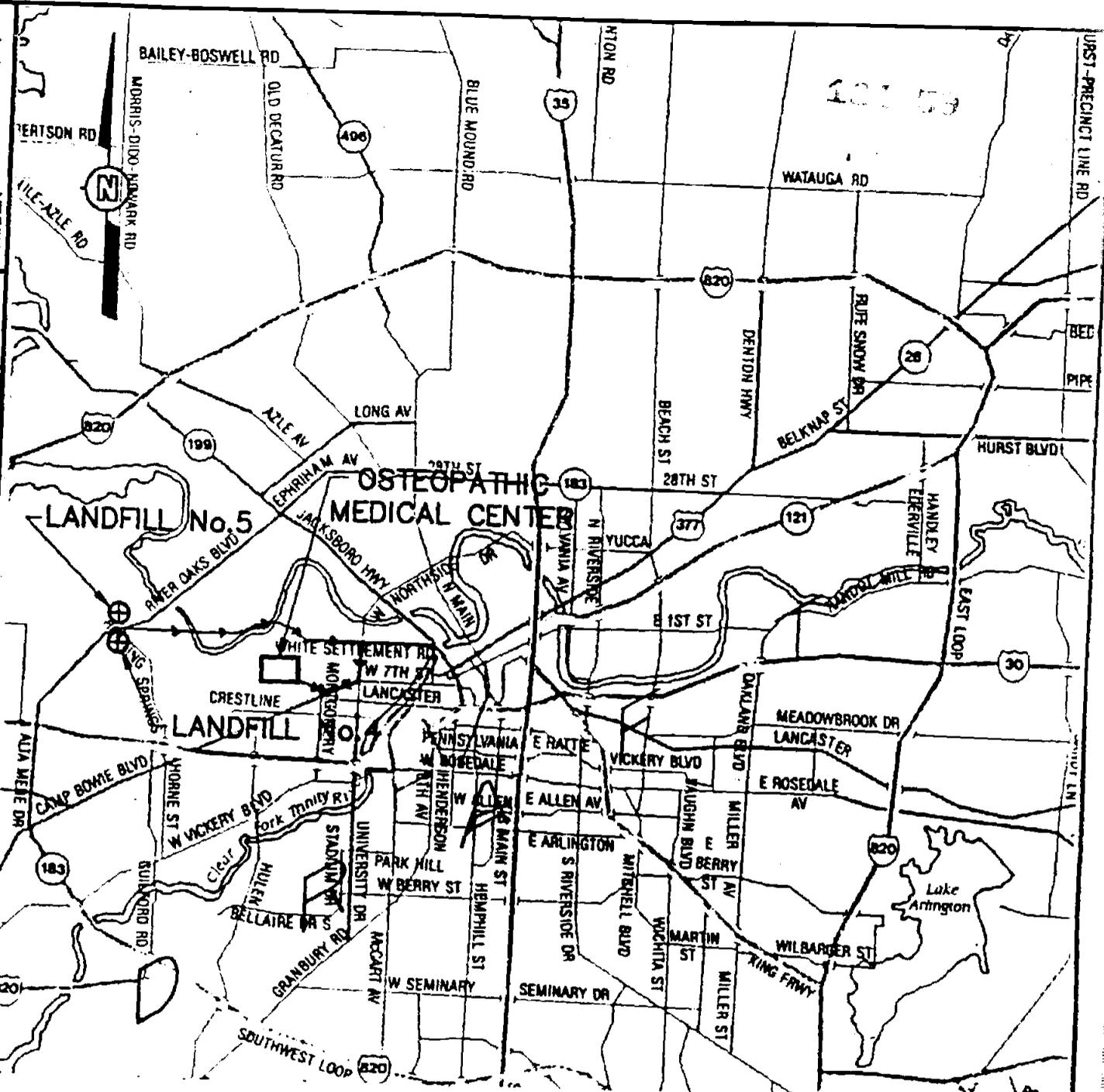
ATTACHMENT A

DRAWING NUMBER 305895-A4

CHECKED BY
APPROVED BY

B.A. KUMPF
9MAR93

DRAWN BY



ATTACHMENT A-1

SITE/HOSPITAL
LOCATION MAP

PREPARED FOR

CARSWELL AIR FORCE BASE
U.S. ARMY CORPS OF ENGINEERS



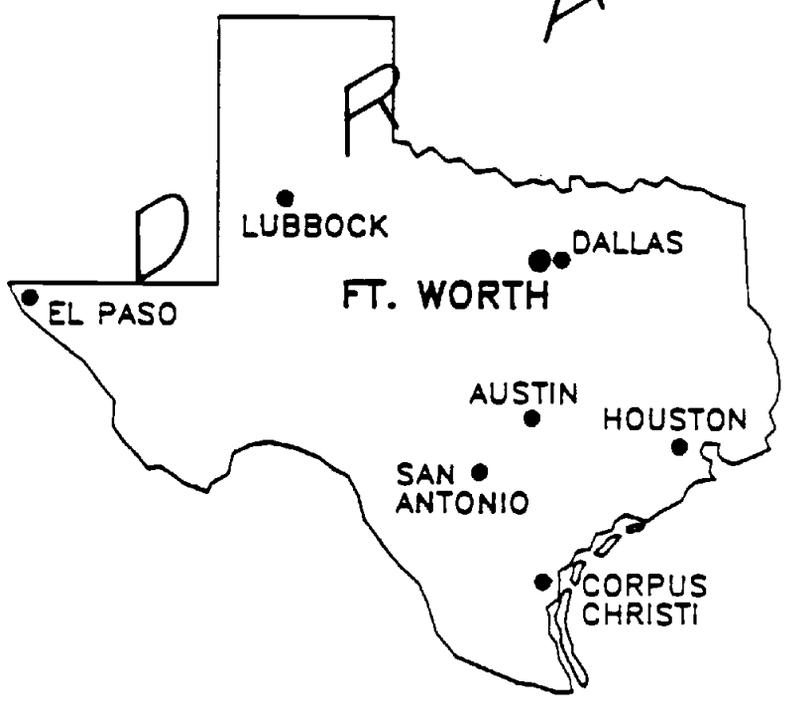
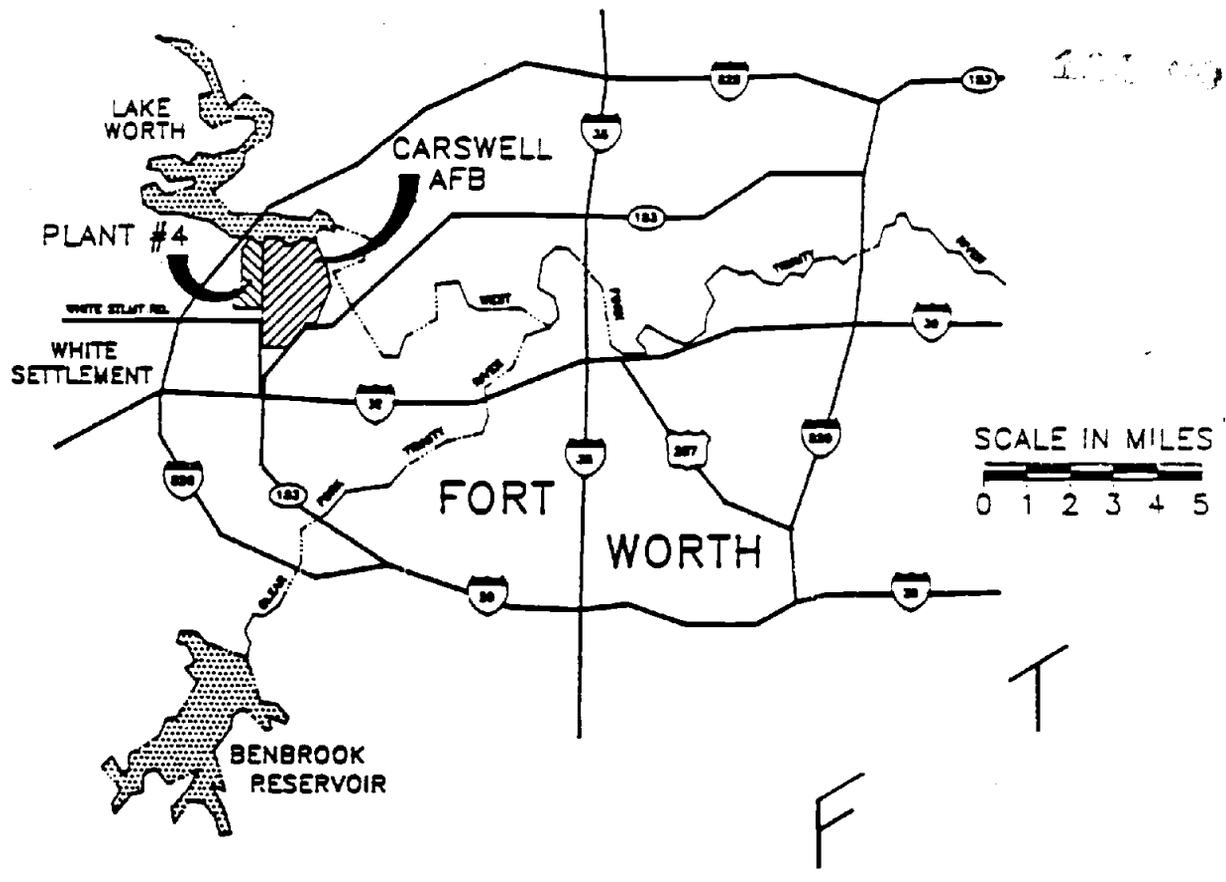
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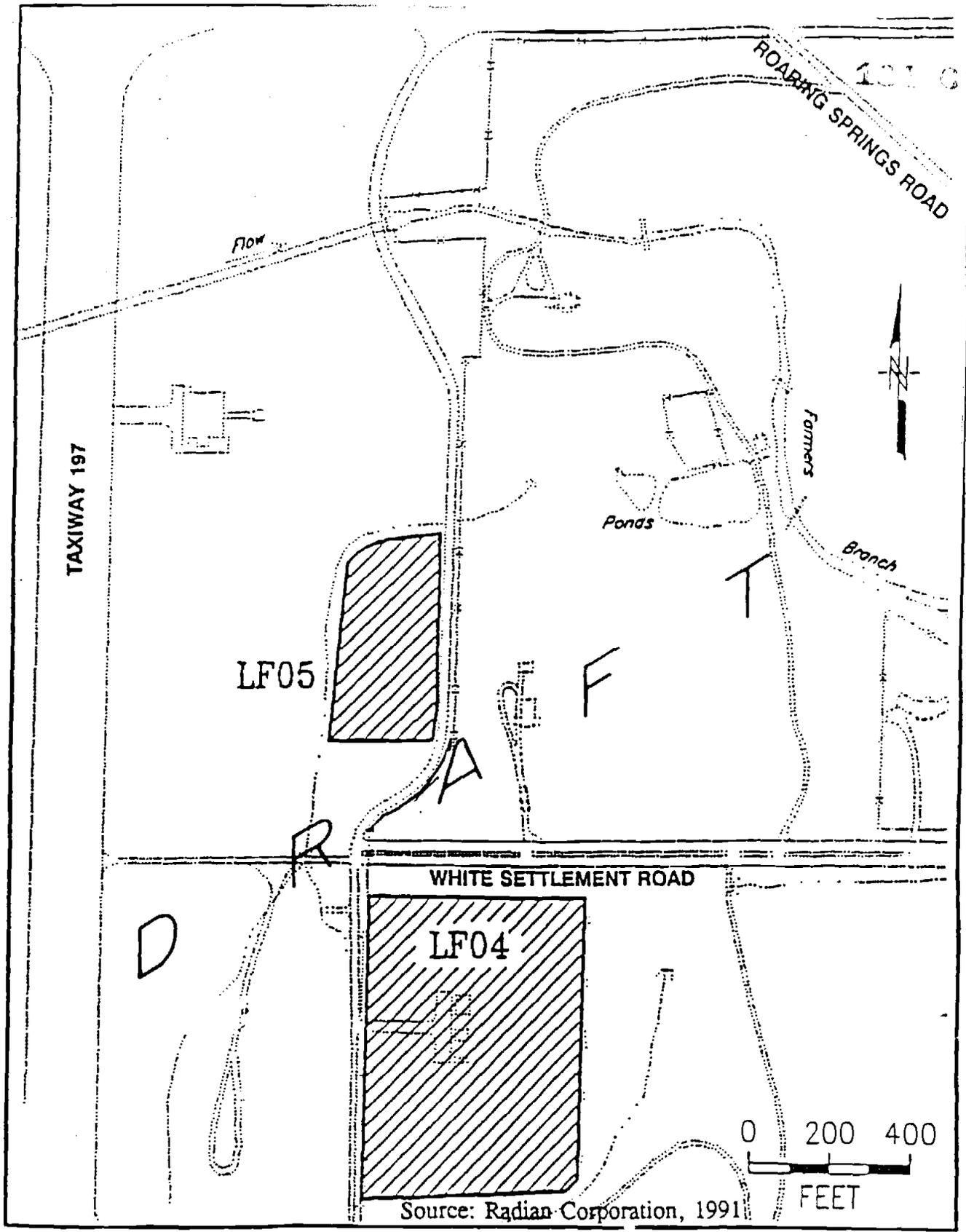
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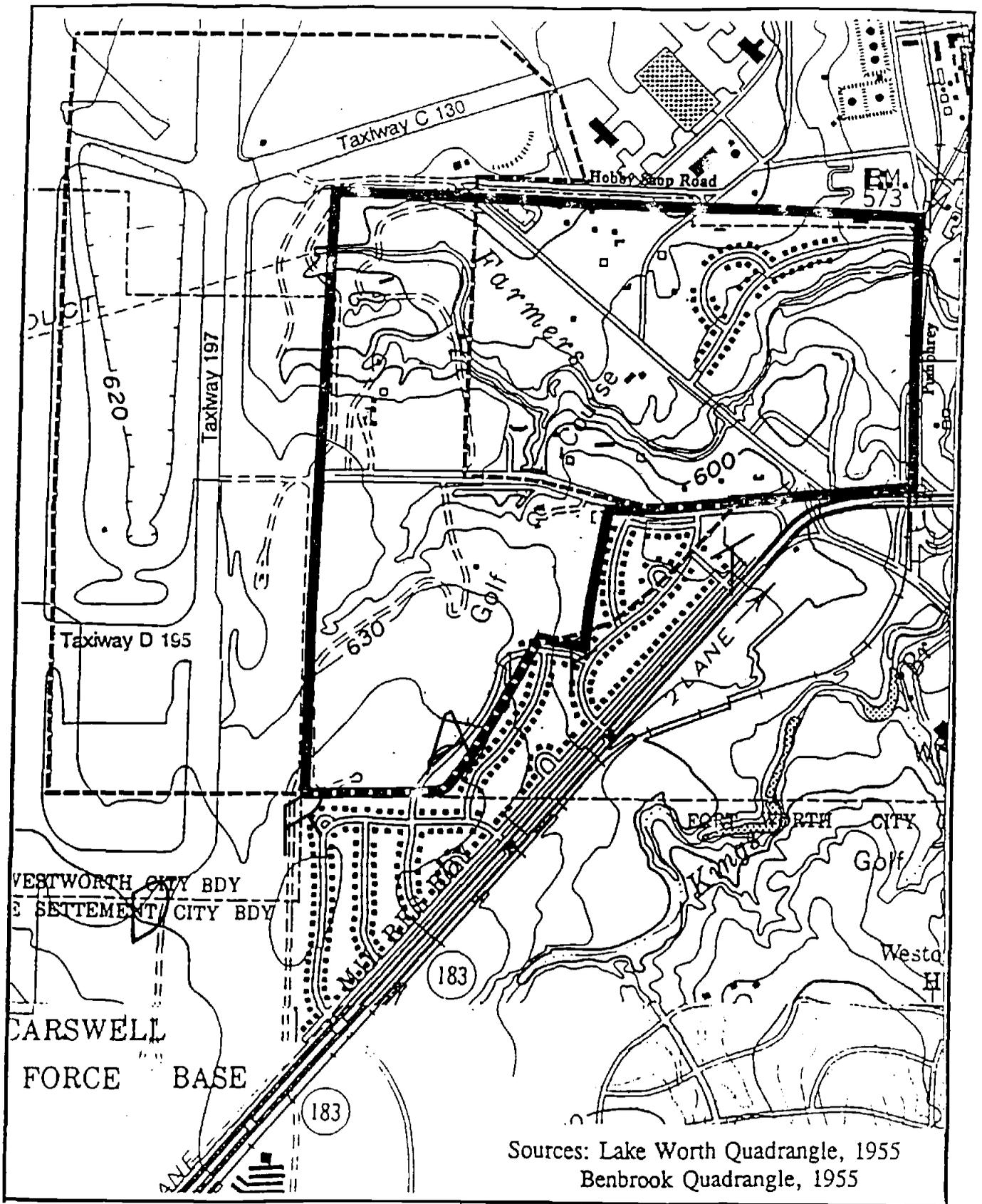


ATTACHMENT A-2
 SITE LOCATION MAP





ATTACHMENT A-3



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ATTACHMENT B

Contractor Certification

I, _____ as an agent of _____, do hereby certify that the following employees have successfully completed a 40-hour training course which complies with the provisions of 29 CFR 1910.120. Each employee has successfully completed a medical examination which complies with the above regulation.

Individual copies of certification of successful completion of the required training and medical examination are attached for each employee.

Signature _____

Date _____

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CHEMICAL INFORMATION TABLES

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Table 1
Exposure Guidelines

<u>CONTAMINANTS</u>	<u>OSHA</u> <u>PEL</u>	<u>ACGIH</u> <u>TWA</u>	<u>ACGIH</u> <u>STEL</u>
Trichloroethylene	100 ppm	50 ppm	200 ppm
2- Hexanone	100 ppm	5 ppm	---
Benzene	1 ppm	10 ppm	---
Toulene	100 ppm	100 ppm	150 ppm
1,2,dichloroethane	100 ppm	100 ppm	---
Chloroform	50 ppm	10 ppm	---
Xylene	100 ppm	100 ppm	150 ppm
Chromium	1 mg/m ³	0.5 mg/m ³	---
Methylene Chloride	100 ppm	50 ppm	---

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Table 2 PPE Selection Matrix

Task 1: Drilling and Installation of Monitoring/Groundwater Recovery Wells (Level C)

- Coveralls or work clothing
- Steel-toed boots
- Latex boot covers
- Air purifying respirator with combination organic vapor and high efficiency particulate air (HEPA) cartridges
- Hard hat
- Nitrile gloves (outer)
- Latex gloves (inner)
- Polycoated Tyvek
- Duct tape openings (ankles and wrists)
- Hearing protection

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Task 2: Groundwater Sampling (Level D Modified)

- Coveralls or work clothing
- Steel-toed boots
- Latex boot covers
- Safety glasses
- Hard hat
- Nitrile gloves
- Hearing protection (if necessary)
- Respiratory protection if action levels are exceeded
- Tyvek coveralls

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Task 3: Construction of Groundwater Treatment Plan (Level D)

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- Coveralls or work clothing
- Steel-toed boots/shoes
- Safety glasses
- Hard hat
- Hearing protection (if necessary)
- Leather palm gloves

**Table 3
Action Levels**

CONTAINMENT	ACTION LEVEL	LEVEL OF PPE
VOC'S	> 1 ppm above background with benzene present >10 ppm above background without benzene present >10 ppm above background with benzene present >20 ppm above background	C C B/Stop Work* B/Stop Work*
LEL	>10 percent of LEL	Stop work*

*Contact with the IT H&S Manager must be made prior to continuance of work.

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

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**Table 4
Groundwater Quality In the Windows Area**

Contaminant Concentrations in Groundwater (PPB)										
Monitoring Well	TCE	2-Hexanone	Benzene	Toluene	1,2-Dichloroethane	Chloroform	Xylene	Chromium	Methylene Chloride	
F-218	3000									
F-219	71									
HM-56	150		89	R						
HM-86	250									
HM-87	350									
HM-88	6700									
HM-89	4800				80000					
HM-90			270			18	23			
HM-94	19000				4000					
HM-103	1900				500					
P-8US	550				1000					
P-9US	4300	2200		800	1000			21900	2500	
P-14US	320									
P-15US	40									

PT-02-93/WP-305895:HSP-AIR(Air Force Plant No. 4)

Table 5 Toxicological Data

The following compounds are known to be present in the Windows area of AFP4. This list will be modified by the H&S Manager as site conditions warrant.

Chromium

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - effects have not been well defined
- Inhalation - irritation of nose and throat, chest pain and shortness of breath
- Skin/Eye - Corrosive action on skin with moderate irritation of eyes

Trichloroethylene

Routes of Entry

- Highly toxic by inhalation and skin/eye contact
- Moderately toxic by ingestion

Symptoms of Exposure

- Ingestion - nausea, vomiting, and diarrhea
- Inhalation - headache, dizziness, vertigo, tremors, nausea, irregular heartbeat, fatigue, blurred vision, and intoxication similar to that of alcohol
- Skin/Eye - burning irritation and damage to eyes, dermatitis

Toluene

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - vomiting, diarrhea, depressed respiratory capability
- Inhalation - headache, dizziness, fatigue, muscular weakness, drowsiness, incoordination
- Skin/Eye - drying, cracking, fissured dermatitis, and temporary corneal injury

Table 5 Toxicological Data (continued)

Benzene

Routes of Entry

- Highly toxic by inhalation.
- Moderately toxic ingestion and skin/eye absorption.

Symptoms of Exposure

- Ingestion - euphoria, changes in motor activities, reduced number of blood platelets, dermatitis, and fever
- Inhalation - headache, dizziness, nausea, convulsions, and overall central nervous system depression
- Skin/Eye Contact - moderate irritability effect, erythema, burning sensation, and eye reddening and tearing

Xylene

Routes of Entry

- Moderately toxic by eye/skin contact and inhalation
- Slightly toxic by ingestion

Symptoms of Exposure

- Ingestion - mild upset stomach along with nausea, and throat irritation
- Inhalation - dizziness, drowsiness, nausea, vomiting, central nervous system depression and minor reversible effects upon liver and kidneys
- Skin/Eye Contact - severe eye irritation with reversible damage, and drying and defatting of skin which may lead to dermatitis

1,2-Dichloroethane

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - drowsiness, weakness, fatigue, and headaches
- Inhalation - dizziness, drowsiness, confusion, unconsciousness, headaches and vision problems, CNS depression
- Skin/Eye - minor rash and irritation, watering of eyes, and slight burning sensation

Table 5
Toxicological Data
(continued)

Methylene Chloride

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - altered sleep time, headache, nausea, vomiting, convulsions, euphoria, changes in heart rate
- Inhalation - headache, giddiness, stupor, irritability, numbness, nausea, vomiting, hallucinations
- Skin/Eye - dry, scaly, fissured dermatitis, skin burns, and slight to moderate irritation to eyes

Chloroform

Routes of Entry

- Highly toxic by inhalation and ingestion
- Moderately toxic by skin/eye contact

Symptoms of Exposure

- Ingestion - nausea, vomiting, headache, dizziness, and other gastrointestinal effects
- Inhalation - dilation of pupils, irritation of mucous membranes, hallucinations, distorted perceptions, nausea, vomiting, dizziness, headache, fatigue, loss of reflexes
- Skin/Eye - skin burns, with moderate eye irritation

2-Hexanone

Routes of Entry

- Moderately toxic by inhalation and ingestion
- Slightly toxic by skin/eye contact

Symptoms of Exposure

- Ingestion - headache, nausea, vomiting, throat irritation, and dizziness
- Inhalation - unspecified eye effects, headache, nausea, or vomiting
- Skin/Eye - mild eye and skin irritation

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ATTACHMENT C

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CHEMICAL INFORMATION TABLES

Table 1
Exposure Guidelines

<u>CONTAMINANTS</u>	<u>OSHA</u> <u>PEL</u>	<u>ACGIH</u> <u>TWA</u>	<u>ACGIH</u> <u>STEL</u>
Trichloroethylene	100 ppm	50 ppm	200 ppm
2- Hexanone	100 ppm	5 ppm	---
Benzene	1 ppm	10 ppm	---
Toulene	100 ppm	100 ppm	150 ppm
1,2,dichloroethane	100 ppm	100 ppm	---
Chloroform	50 ppm	10 ppm	---
Xylene	100 ppm	100 ppm	150 ppm
Chromium	1 mg/m ³	0.5 mg/m ³	---
Methylene Chloride	100 ppm	50 ppm	---

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Table 2 PPE Selection Matrix

Task 1: Drilling and Installation of Monitoring/Groundwater Recovery Wells (Level C)

- Coveralls or work clothing
- Steel-toed boots
- Latex boot covers
- Air purifying respirator with combination organic vapor and high efficiency particulate air (HEPA) cartridges
- Hard hat
- Nitrile gloves (outer)
- Latex gloves (inner)
- Polycoated Tyvek
- Duct tape openings (ankles and wrists)
- Hearing protection

Task 2: Groundwater Sampling (Level D Modified)

- Coveralls or work clothing
- Steel-toed boots
- Latex boot covers
- Safety glasses
- Hard hat
- Nitrile gloves
- Hearing protection (if necessary)
- Respiratory protection if action levels are exceeded
- Tyvek coveralls

Task 3: Construction of Groundwater Treatment Plan (Level D)

- Coveralls or work clothing
- Steel-toed boots/shoes
- Safety glasses
- Hard hat
- Hearing protection (if necessary)
- Leather palm gloves

**Table 3
Action Levels**

CONTAINMENT	ACTION LEVEL	LEVEL OF PPE
VOC'S	> 1 ppm above background with benzene present >10 ppm above background without benzene present >10 ppm above background with benzene present >20 ppm above background	C C B/Stop Work* B/Stop Work*
LEL	>10 percent of LEL	Stop work*

*Contact with the IT H&S Manager must be made prior to continuance of work.

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

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**Table 4
Groundwater Quality in the Windows Area**

Contaminate Concentrations in Groundwater (PPB)										
Monitoring Well	TCE	2-Hexanone	Benzene	Toluene	1,2-Dichloroethane	Chloroform	Xylene	Chromium	Methylene Chloride	
F-218	3000									
F-219	71									
HM-56	150		89							
HM-86	250									
HM-87	350									
HM-88	6700									
HM-89	4800				> 80000					
HM-90			270			18	23			
HM-94	19000				4000					
HM-103	1900				500					
P-8US	550				1000					
P-9US	4300	2200		800	1000			21900	2500	
P-14US	320									
P-15US	40									

PT02-93AWP-005895:HSP-AR(Air Force Plant No. 4)

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Table 5 Toxicological Data

The following compounds are known to be present in the Windows area of AFP4. This list will be modified by the H&S Manager as site conditions warrant.

Chromium

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - effects have not been well defined
- Inhalation - irritation of nose and throat, chest pain and shortness of breath
- Skin/Eye - Corrosive action on skin with moderate irritation of eyes

Trichloroethylene

Routes of Entry

- Highly toxic by inhalation and skin/eye contact
- Moderately toxic by ingestion

Symptoms of Exposure

- Ingestion - nausea, vomiting, and diarrhea
- Inhalation - headache, dizziness, vertigo, tremors, nausea, irregular heartbeat, fatigue, blurred vision, and intoxication similar to that of alcohol
- Skin/Eye - burning irritation and damage to eyes, dermatitis

Toluene

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - vomiting, diarrhea, depressed respiratory capability
- Inhalation - headache, dizziness, fatigue, muscular weakness, drowsiness, incoordination
- Skin/Eye - drying, cracking, fissured dermatitis, and temporary corneal injury

Table 5 Toxicological Data (continued)

Benzene

Routes of Entry

- Highly toxic by inhalation.
- Moderately toxic ingestion and skin/eye absorption.

Symptoms of Exposure

- Ingestion - euphoria, changes in motor activities, reduced number of blood platelets, dermatitis, and fever
- Inhalation - headache, dizziness, nausea, convulsions, and overall central nervous system depression
- Skin/Eye Contact - moderate irritability effect, erythema, burning sensation, and eye reddening and tearing

Xylene

Routes of Entry

- Moderately toxic by eye/skin contact and inhalation
- Slightly toxic by ingestion

Symptoms of Exposure

- Ingestion - mild upset stomach along with nausea, and throat irritation
- Inhalation - dizziness, drowsiness, nausea, vomiting, central nervous system depression and minor reversible effects upon liver and kidneys
- Skin/Eye Contact - severe eye irritation with reversible damage, and drying and defatting of skin which may lead to dermatitis

1,2,Dichloroethane

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - drowsiness, weakness, fatigue, and headaches
- Inhalation - dizziness, drowsiness, confusion, unconsciousness, headaches and vision problems, CNS depression
- Skin/Eye - minor rash and irritation, watering of eyes, and slight burning sensation

Table 5 Toxicological Data (continued)

Methylene Chloride

Routes of Entry

- Highly toxic by inhalation
- Moderately toxic by ingestion and skin/eye contact

Symptoms of Exposure

- Ingestion - altered sleep time, headache, nausea, vomiting, convulsions, euphoria, changes in heart rate
- Inhalation - headache, giddiness, stupor, irritability, numbness, nausea, vomiting, hallucinations
- Skin/Eye - dry, scaly, fissured dermatitis, skin burns, and slight to moderate irritation to eyes

T

Chloroform

Routes of Entry

- Highly toxic by inhalation and ingestion
- Moderately toxic by skin/eye contact

F

A

Symptoms of Exposure

- Ingestion - nausea, vomiting, headache, dizziness, and other gastrointestinal effects
- Inhalation - dilation of pupils, irritation of mucous membranes, hallucinations, distorted perceptions, nausea, vomiting, dizziness, headache, fatigue, loss of reflexes
- Skin/Eye - skin burns, with moderate eye irritation

R

D

2-Hexanone

Routes of Entry

- Moderately toxic by inhalation and ingestion
- Slightly toxic by skin/eye contact

Symptoms of Exposure

- Ingestion - headache, nausea, vomiting, throat irritation, and dizziness
- Inhalation - unspecified eye effects, headache, nausea, or vomiting
- Skin/Eye - mild eye and skin irritation

TASK 1: DRILLING AND MONITORING WELL INSTALLATION

Principal Steps	Potential Hazards	Recommended Controls
Drill rig inspection	Faulty or damaged equipment being utilized to perform work	All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition.
		Equipment will be inspected before being put to use and at the beginning of each shift.
		Faulty/unsafe equipment will be tagged and if possible locked out.
Drill rig staging	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	Inspections or determinations of road conditions and structures shall be made in advance to assure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Above and below ground utilities will be located prior to staging equipment.
		Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines will have the wheels chocked.
		Inspect brakes and tire pressure on drill rig before staging for work.
Drill rig operation D	Unexperienced operator	Machinery and mechanized equipment shall be operated only by designated personnel.
	Jacks/outriggers	Insure proper footing and cribbing.
	Falling objects	Hardhats, remove unsecured tools and materials before raising or lowering the derrick.
		Stay alert and clear of materials suspended overhead.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!!!

Principal Steps	Potential Hazards	Recommended Controls
	Fire	Keep areas adjacent to derricks reasonably free from accumulation of oil, fuel, or other materials (good housekeeping).
		Have fire extinguishers inspected and readily available.
	Fall hazards	Use safety belts and lifeline when working above 6 ft.
	Noise	Hearing protection is mandatory above 85 dbA.
	Contact with rotating or reciprocating machine parts	Machine guards, use long-handled shovels to remove auger cuttings.
		Safe lockout procedures for maintenance work.
	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs require assistance or mechanical equipment. Size-up the lift. Recommend wearing a back support if possible.
	Slip, trip and fall hazards	Good housekeeping, keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Contact with potentially contaminated materials	Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.

Note: Section 4.4 of the Health and Safety Plan addresses additional safety concerns for drilling.

TASK 2: GROUNDWATER SAMPLING

Principal Steps	Potential Hazards	Recommended Controls
Decontamination	Cross-contamination and contact with potentially contaminated materials	Proper-decontamination procedures shall be followed.
		All liquids and materials used for decontamination shall be contained and disposed of in accordance with Federal, State and Local regulations.
		Follow good hygiene practices.
	Hazard communication	Label all containers as to contents and dispose of properly.
Moving and shipping collected samples	Heavy lifting	Any lifting of 60 lbs or more requires assistance or a mechanical lifting device.
		Follow safe lifting procedures.
	Hazard communication	Label all containers as to contents and associated hazards.
Staging equipment	Contact with moving equipment/vehicles	Area around monitoring well will be barricaded/demarcated.
	R	Equipment will be layed out in an area free of traffic flow.
	D Cut hazards	Use care when handling any glassware.
		Wear adequate hand protection
Collect samples	Chemical contamination	Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.
	Hazard communication	Label all containers as to contents.
	General safety concerns	See section 3.2.2 of HASP.
	Cuts	Use care when handling glassware.
		Wear adequate hand protection
	Sprain/strains	Use caution when removing well caps.

Principal Steps	Potential Hazards	Recommended Controls
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
Preparation of foundation/work platform	Heavy equipment operation	All self-propelled construction equipment shall be equipped with a back-up alarm.
		Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 5 B:C.
	Contact with underground utilities	All underground utilities shall be located and marked prior to excavation operations.
	Open excavations	IT Policy and Procedure HS307 "Excavation and Trenching" will be adhered to at all times.
Painting	Contact with or exposure to toxic materials	Hazard communication - all containers of paints, thinners, etc. shall be properly labeled and a MSDS will be kept onsite for the material.
		Proper protective clothing and equipment will be used in accordance with the MSDS
		All waste materials shall be disposed of in accordance with Federal, State and Local regulations.

TASK 3: CONSTRUCTION OF GROUNDWATER TREATMENT PLANT

Principal Steps	Potential Hazards	Recommended Controls
Welding and Cutting	U.V. light, fire	Utilize appropriate eye protection. Provide fire watch. Obtain hot work permit. Torches must have anti-flashback device.
	Pressurized cylinders	Properly store and secure compressed gas cylinders.
Handling sharp objects	Cuts	Wear appropriate hand protection.
Grinding/sawing	Flying particles	Proper eye protection.
Working on elevated heights	Falls	Lanyards, lifelines and ladder/scaffolding safety.
	Falling objects	Overhead protection/hardhats
Material storage	Flammable and combustible liquids	Store in NO SMOKING AREA and 50 ft from combustible construction materials.
		Fire extinguisher readily available.
		Properly grounded and bonded.
	Round stock A	Secure from rolling, work from the top of the stack.
Material storage	Slip, trip and fall hazards R	Good housekeeping
	Sprains and strains	Safe lifting procedures
	Pinch points/cuts D	Adequate hand protection and observation of contact points.
	Hazard communication	Proper labeling/MSDS's
Hoisting equipment and materials	Suspended loads	Taglines, inspect ropes, slings and chains. Load testing/equipment inspection signal persons "Do not walk or work under suspended loads".
Assembly	Pinch points/cuts	Adequate hand protection and observe contact points.
	Electrical hand tools/electrocution	Ground fault circuit interrupters inspect extension cords, hand tool inspection, lockout - tagout procedure.

Principal Steps	Potential Hazards	Recommended Controls
	Contact with glues, solvents etc.	Be familiar with the materials you are working with. (MSDS's)
	Noise	If noise levels exceed 85 dbls wear hearing protection.
Assembly	Heavy lifting	Safe lifting procedures. Loads over 60 lbs require assistance or mechanical lifting device.
	Slip, trip and fall hazards	Good housekeeping
	Confined spaces	Follow IT Corporation H&S 300 Policy and Procedure.
	Excavation and trenching	Follow IT Corporation HS 307 Policy and Procedure.
	Hot work	Hot work permits
Preparation of foundation/work platform	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in a safe operating condition.
	R	Equipment shall be inspected before being placed into service and at the beginning of each shift.
D		Preventative maintenance procedures recommended by the manufacturer shall be followed.
Preparation of foundation/work platform	Heavy equipment operations	A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.

Principal Steps	Potential Hazards	Recommended Controls
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
Preparation of foundation/work platform	Heavy equipment operation	All self-propelled construction equipment shall be equipped with a back-up alarm.
		Each bulldozer, backhoe or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum U.L. rating of 5 B:C.
	Contact with underground utilities	All underground utilities shall be located and marked prior to excavation operations.
	Open excavations	IT Policy and Procedure HS 307 "Excavation and Trenching" will be adhered to at all times.
Painting	Contact with or exposure to toxic materials	Hazard communication - all containers of paints, thinners, etc. shall be properly labeled and a MSDS will be kept onsite for the material.
		Proper protective clothing and equipment will be used in accordance with the MSDS.
		All waste materials shall be disposed of in accordance with Federal, State and Local regulations.

**ACTIVITY HAZARD ANALYSIS
DIGGING TRENCHES AND INSTALLING
BURIED PIPELINES AND ELECTRICAL LINE**

Principal Steps	Potential Hazards	Recommended Controls
Excavate trench	Underground utilities	All underground utilities will be located prior to excavating.
	Open trenches	IT Policy and Procedure HS307- "Excavation and Trenching" will be adhered to at all times.
	Contact with potentially contaminated materials	Real time air monitoring will take place. If necessary proper personal protective clothing and equipment will be utilized.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in a safe operating condition.
D	R A	Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventative maintenance procedures recommended by the manufacturer shall be followed.
	Equipment operations	A lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.

Principal Steps	Potential Hazards	Recommended Controls
Excavate trench	Equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
	Fire	A dry chemical fire extinguisher will be readily available.
	Pinch points	Keep hands, fingers, and feet clear of moving parts.
Install pipelines and electrical line	Electrical shock	Electrical line will be installed and connected by a qualified individual.
	Heavy lifting	Any lifting over 60 lbs. requires assistance or the use of a mechanical lifting device.
D	Slip, trip, fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip, and fall hazards. Look where you step, ensure safe footing.
	Cut hazards	Wear adequate hand protection.
	Traffic	Work area will be barricaded off.
		Personnel will wear reflective vests for high visibility.
	Hazard communication	Obtain MSDs for materials used on site. Label all containers as to contents.

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

