- The potential for injury due to fire/explosion if methane gas is released during drilling operations and/or excavations (see Sections 5.0 and 11.0).

2.3 BIOLOGICAL HAZARDS

- **Poison Ivy (Rhus Radicans)**

Poison ivy may be found at the site. It is highly recommended that all personnel entering into an area with poison wear a minimum of a paper Tyvek to avoid skin contact.

Contact with poisonous plants:

Characteristic Reactions:

The majority of skin reactions following contact with offending plants are allergic in nature and characterized by:

- general symptoms of headache and fever
- itching
- redness
- a rash

Some of the most common and most severe allergic reactions result from contact with plants of the poison ivy group, including poison oak and poison sumac. Such plants produce severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim may develop a high fever and feel very ill. Ordinarily, the rash begins within a few hours after exposure, but may be delayed 24 to 48 hours.

Distinguishing Features of Poison Ivy Group Plants:

The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. Both plants have greenish-white flowers and berries that grow in clusters.

First Aid:

a. Remove contaminated clothing; wash all exposed areas thoroughly with soap and water, followed by rubbing alcohol.

b. Apply calamine or other soothing lotion if rash is mild.

c. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.

- **Ticks**

Heavily vegetated areas of a site may have ticks. it is highly recommended that all personnel walking through such areas wear a minimum of a paper Tyvek and latex boot covers. The ticks will stand out against the light colors. A tick repellent or insect repellent containing DEET is also suggested.

Ticks can transmit several diseases, including Rocky Mountain spotted fever, a disease that occurs in the eastern portion of the United States as well as the western portion, and Lyme disease. Ticks adhere tenaciously to the skin or scalp. there is some evidence that the longer an infected tick remains attached, the greater is the chance that it will transmit disease.

First Aid:

a. Cover the tick with heavy oil (mineral, salad, or machine) to close its breathing pores. The tick may disengage at once; if not, allow oil to remain in place for a half hour. Carefully (slowly and gently) remove the tick with tweezers, taking care that all parts are removed.

b. With soap and water, thoroughly, but gently, scrub the area from which the tick has been removed, because disease germs may be present on the skin; also wipe the bite area with an antiseptic. Although use of tweezers for the removal of the tick and application of heat to the tick's body often have been attempted, these methods may leave tick parts in the wound or may injure the skin.

c. If you have been bitten, place the tick in a jar labeled with the date, location of the bite, and the location acquired. If any symptom appears, such as an expanding red rash, contact a physician immediately.

- **Lyme Disease**

Lyme disease may cause a number of medical conditions, including arthritis, that can be treated if you recognize the symptoms early and see your doctor. Early signs may include a flu-like illness, an expanding skin rash, and joint pain. If left untreated, Lyme disease can cause serious nerve and heart problems as well as a disabling type of arthritis.

You are more likely to spot early signs of Lyme disease rather than see the tick or its bite. This is because the tick is so small (about the size of the head of a common pin or a period on this page and a little larger after they fill with blood), you may miss it or signs of a bite. However, it is also easy to miss the early symptoms of Lyme disease.

In its early stage, Lyme disease may be a mild illness with symptoms like the flu. It can include a stiff neck, chills, fever, sore throat, headache, fatigue, and joint

pain. But this flu-like illness is usually out of season, commonly happening between May and October when ticks bite.

Most people develop a large, expanding skin rash around the area of the bite. Some people may get more than one rash. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and the tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one-third of those with Lyme disease never get the rash.

Joint or muscle pain may be another early sign of Lyme disease. These aches and pains maya be easy to confuse with the pain that comes from other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

In later stages, lyme disease may be confused with other medical problems. These problems can develop months to years after the first tick bite.

Early treatment of Lyme disease symptoms with antibiotics can prevent the more serious medical problems of later sages. If you suspect that you have symptoms of Lyme disease, contact your doctor.

Lyme disease can cause problems with the nervous system that look like diseases. These include symptoms of stiff neck, severe headache, and fatigue usually linked to meningitis. They may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease can also mimic symptoms of multiple sclerosis or other types of paralysis.

Lyme disease can also cause serious but reversible heart problems, such as irregular heart beat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Researchers think these more serious problems may be linked to how the body's defense or immune system responds to the infection.

2.4 NOISE

Hearing protection is required for workers operating or working near heavy equipment where the noise level is greater than 85 dBA (TWA). The SSHO will determine the need for and appropriate testing procedures; i.e., sound level meter and/or dosimeter for noise measurement.

2.5 CHEMICAL HAZARDS

This section presents an example of a chemical Hazards Summary for a site characterized by trichloroethylene (TCE) contamination. Similar information will need to be provided on a site-by-site basis for all chemicals that may be encountered during the well decommissioning work.

Table 2-1 presents the potential chemicals that may be encountered during well decommissioning work at the _____ Site. The information presented in Table 2-1 is based on the available analytical data for the wells to be decommissioned. A summary of the exposure hazards for these chemicals is presented below.

- **Trichloroethylene (TCE)** is a common industrial solvent used primarily in dry cleaning and metal degreasing. Trichloroethylene exposure at vapor levels of 200 ppm has been associated with mild behavioral and psychomotor effects, including vertigo, fatigue, and headache. TCE is a suspected human carcinogen. The principal routes of potential personnel exposure to TCE are through inhalation of volatilized TCE and direct skin contact.

3.0 MEDICAL SURVEILLANCE

Medical monitoring, including initial employment, annual and employment termination examinations will be provided to Consultant employees whose work may result in potential chemical exposure or present unusual physical demands. Medical evaluations will be performed by an occupational physician designated by Consultant. The medical evaluations will be conducted according to the Consultant Medical Monitoring Program and include an evaluation of the workers' ability to use respirator protective equipment (as per 29 CFR 1910). The examination will include:

- Occupational history;
- Medical history;
- Medical review;
- Medical surveillance examination with emphasis on organ systems potentially affected by toxic substances identified in the work environment;
- Medical certification of physical requirements (sight, hearing, musculoskeletal, cardiovascular) for safe job performance; and
- Laboratory testing to include a complete blood count, white cell differential count, serum multiphasic screening and urinalysis.

The purposes of the medical evaluation are to: (1) determine fitness for duty on hazardous waste sites (such an evaluation is based upon the employee's occupational and medical history, a comprehensive physical examination and an evaluation of the ability to work while wearing protective equipment); and (2) establish baseline medical data.

Supplemental examinations may be performed whenever there is an actual or suspected excessive exposure to chemical contaminants or upon experience of exposure symptoms, or following injuries or temperature stresses.

In conformance with OSHA regulations, Consultant will maintain and preserve medical records for a period of 30 years following termination of employment. Employees have access to the results of medical testing and to full medical records and analyses.

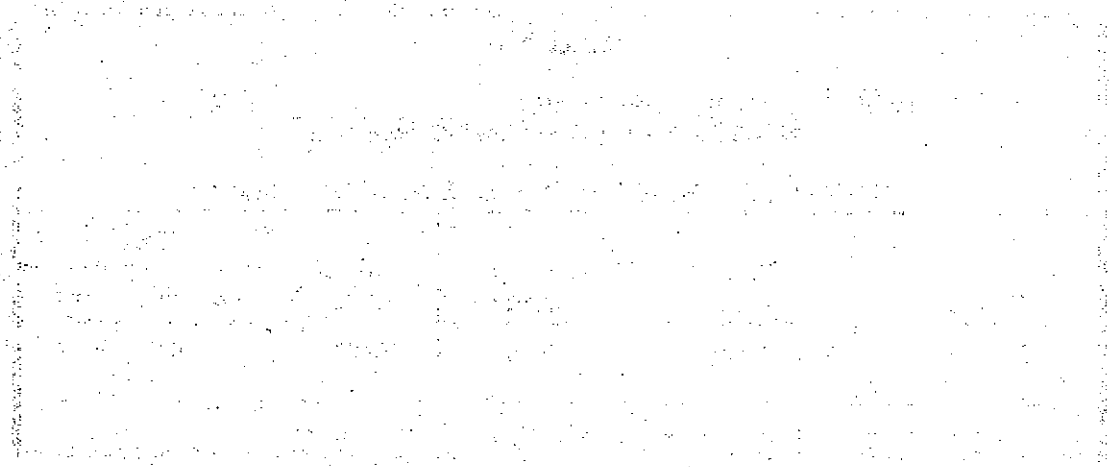
TABLE 2-1

HEALTH AND SAFETY PLAN FOR _____ SITE
MONITORING WELL DECOMMISSIONING

POTENTIAL CONTAMINANTS AND CONCENTRATIONS

Chemical	Affected Media	Maximum Concentration	Location of Max.	TWA[1]	
				mg/m³	ppm
Trichloroethylene (TCE)	Groundwater	1,500 ug/l	MW-1	269	50

Note (1): *Time-weighted average per 1994 ACGIH Threshold Limit Values.*



4.0 EMPLOYEE TRAINING PROGRAM

All employees who may be exposed to hazardous substances, health hazards, or safety hazards shall be adequately trained prior to engaging in any on-site work activities. At a minimum, such training shall include an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor (i.e., the Health and Safety Coordinator or his/her designee). This training shall be conducted by a qualified instructor and shall be specifically designed to meet the requirements of OSHA Standard 29 CFR 1910.120(e)(2). At a minimum, the initial 40-hour training course will include the following:

TOPICS

- OSHA/SARA/EPA/RCRA/HCS Requirements
- Decontamination of Personnel & Equipment
- Fire, Explosion & Accident Prevention
- Respiratory Protection Selection & Use
- Preparation of Health & Safety Plans
- Emergency Preparedness & Escape
- Protective Clothing Use & Selection
- Air Monitoring & Surveillance
- Work Practices to Minimize Risk
- Waste Site Safety
- Hazard Recognition
- Medical Surveillance
- Cold & Heat Stress
- Site Entry & Set-Up
- Permissible Exposure Limits
- Site Control & Work Zones
- Chemical & Physical Hazards
- Confined Space Entry

WORKSHOPS/EXERCISES

- Self-Contained Breathing Apparatus
- Air Monitoring Equipment Workshop
- Air Purifying Respirator Workshop
- Decontamination
- Qualitative/Quantitative Fit Test
- Level A/B Field Exercise
- Level B/C Field Exercise
- Air Tank Refilling Workshop

Records and certifications received from the course instructor documenting each employee's successful completion of the training identified above will be maintained on file in Consultant's

corporate headquarters offices. Subcontractor(s) will be required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not received adequate training and has been so certified shall be prohibited from engaging in on-site work activities that may involve exposure to hazardous substances, health hazards or safety hazards. All individuals functioning in a supervisory capacity shall have had a minimum of 8 hours of Hazardous Waste Site Supervisor Training.

Prior to commencing work at a hazardous waste site, all Consultant employees will participate in an initial health and safety briefing conducted by the Site Health and Safety Officer to discuss site-specific hazards, PPE requirements, and emergency response procedures. In addition, periodic health and safety briefings will be conducted by Consultant's Site Health and Safety Officer for Consultant employees on an as-needed basis. Problems relative to respiratory protection, inclement weather, heat/cold stress or the interpretation of newly-available environmental monitoring data are examples of topics which might be covered during these briefings.

5.0 SAFE WORK PRACTICES

All Consultant employees shall obey the following safety rules during on-site work activities conducted within the exclusion and support zones:

General:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice which increases the probability of hand-to-mouth transfer of contaminated material is strictly prohibited;
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Any required respiratory protective equipment and clothing must be worn by all personnel going on-site. Excessive facial hair (i.e., beards, long mustaches or sideburns), which interferes with the satisfactory respirator-to-face seal is prohibited;
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, crosscontamination and need for decontamination;
- Medicine and alcohol can potentiate the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the consultant occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during site work activities;
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan;
- On-site personnel shall use the "buddy" system. No one may work alone, i.e., out of earshot or visual contact with other workers in the exclusion zone;
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective site operations;
- All employees have the obligation to correct or report unsafe work conditions;
- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for Consultant employees, as required.

The recommended general safety practices for working around the drilling Contractor's and/or backhoe operator's equipment (i.e. drill rigs and backhoes) are as follows:

Contractor's Duties:

- The drilling Contractor is responsible for the condition of his equipment and its safe operation on the site. Consultant personnel are responsible for their own safety when working around this equipment. The inspector will include a check for obvious structural damage, loose nuts and bolts, loose or missing guards, cable guides or protective covers, fluid leaks, damaged hoses, cables, pressure gauges or pressure relief valves, and damaged drilling tools and equipment. The equipment should also have a fire extinguisher. The project manager will notify all subcontractors that they are expected to conduct daily inspections of their equipment and report any potential problems to the Consultant Site Health and Safety Coordinator or his/her designee. If the condition of the equipment is considered to be unsafe based on the Contractor's inspection, and/or the Consultant Site Health and Safety Coordinator's inspection, have the Contractor make the necessary repairs prior to beginning construction. If the Contractor refuses to fix the equipment or is not operating the equipment safely, the job site will be closed down and the Project Manager contacted for additional instructions.

- Drilling/excavation will not be initiated without first clearing underground services such as; gas, water, telephone, sewer, hydrogen, steam, and cable T.V.

- Drill rigs and backhoes should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated. The site should also be clear to ensure the project staff can move around the heavy machinery safely.

- Slippage is one of the most common causes of accidents around drill rigs and test pits. Drainage should be provided to divert mud and water away from the construction site.

- The Contractor should keep the construction site tidy. This will prevent personnel from tripping and will allow for fast emergency exit from the site.

- A drill rig must not be moved from site to site with the drill mast in the raised position.

- Proper lighting will be provided if drilling/excavating at night.

- Drilling/excavation will be discontinued during an electrical storm.

Consultant's Duties:

- Hard hats and safety boots must be worn at all times in the vicinity of the drill rig and/or backhoe. Hearing protection is also recommended. Safety glasses are necessary.
- The presence of combustible gases should be checked before igniting any open flame (e.g., during welding).
- Consultant personnel shall stand upwind of any drilling/excavating operation when not immediately involved in sampling/logging activities.
- Consultant personnel will not enter trenches unless the trenches are shored or back sloped according to OSHA 29CFR 1926.652.
- Consultant personnel will not approach the edge of an unsecured trench closer than 2 feet.

6.0 PERSONAL PROTECTIVE EQUIPMENT

This section presents an example of personal protective equipment requirements for an unspecified site. Similar information will need to be provided on a site-by-site basis for all tasks that will be undertaken as part of the well decommissioning work.

6.1 PROTECTION LEVELS

Personnel must wear protective equipment when work activities involve known or suspected atmospheric contamination; when vapors, gases, or particulates may be generated; or when direct contact with dermal-active substances may occur. Full-face respirators will be used to protect the lungs, the gastrointestinal tract, and the eyes against air toxicants. Chemical-resistant clothing will be used to protect the skin from contact with skin-destructive and skin-absorbable chemicals. All personal protective equipment shall be maintained and stored as specified by the manufacturers. Good personal hygiene and safe work practices, as identified in Section 5.0, are also necessary to limit or prevent the ingestion of potentially harmful substances.

Based upon current information regarding both the contaminants suspected to be present at the _____ Site and the various tasks that are included in the well decommissioning program, the minimum required levels of protection shall be as identified in Table 6-1. The Site Health and Safety office will monitor the use of PPE during extreme temperature conditions.

EXAMPLE

TABLE 6-1

HEALTH AND SAFETY PLAN FOR _____ SITE
MONITORING WELL DECOMMISSIONING

REQUIRED LEVELS OF PROTECTION

Activity	Respiratory*	Clothing[2]	Gloves	Boots	Other Modifications[3]
Field Reconnaissance	D/C	T	–	L	Safety Glasses
Well Decommissioning Inspection	D/C	T	L/N	L	Hard Hat, Safety Glasses

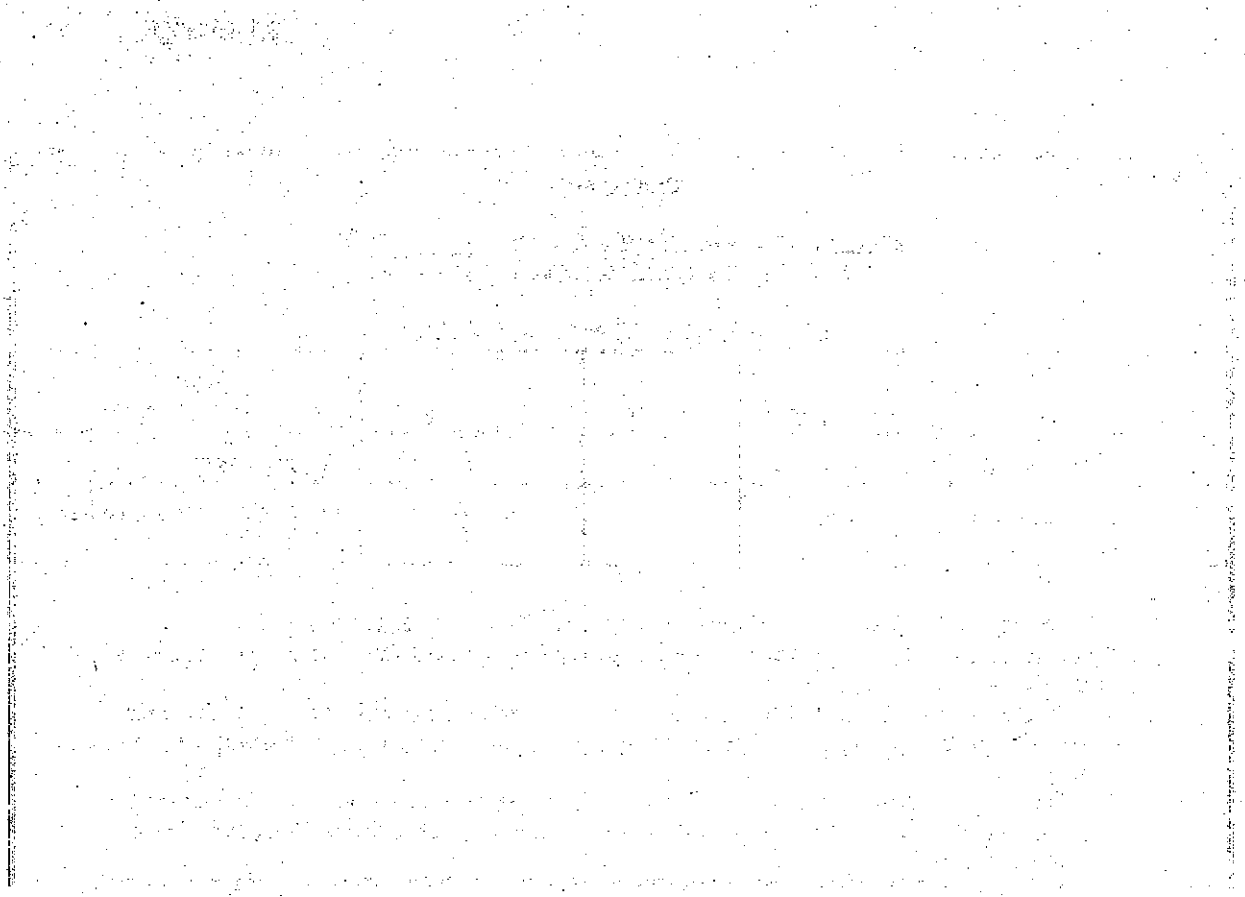
Notes:

(1) T = Tyvek; L/N = Latex Inner Glove, Nitrile Outer Glove; L = Latex Outer Boot

(2) Tyvek uniforms will be worn when Level C conditions are present (mandatory) or when Level D conditions are present (optional).

(3) At the discretion of the Site Health and Safety Officer, respirators will be donned whenever potentially contaminated airborne particulate (i.e., dust) are generated in significant amounts in the breathing zone.

* Respiratory protection shall correspond to guidelines presented in Section 7.2. The Level C requirement is an air-purifying cartridge respirator equipped with Organic Compound/Acid Gases/Dust cartridges.



7.0 ENVIRONMENTAL MONITORING

7.1 GENERAL APPROACH

7.1.1 On-Site Monitoring

Modifications to the level of protection established for consultant employees for each task will be based upon measurements of the contaminants present in the work environment. Tasks and activities proposed for each site along with the estimated potential of exposure to contaminants known to be present in the groundwater and soil at each site will be used to determine the minimum required levels of personal protection and will be described in the Site-Specific Health and Safety Plans. Based upon the existing data base, a release of organic vapors is anticipated during both intrusive investigations and sampling activities. Ambient breathing zone concentrations may, at times, exceed the permissible exposure limits (PEL) established by OSHA for the individual compounds (see Table ____). Respiratory and dermal protection may be modified (upgraded or downgraded) based upon real-time field monitoring data.

Contaminated soil and groundwater are most likely to be encountered during over drilling, excavation, sampling and other monitoring well decommissioning activities. The air monitoring program to be implemented by Consultant will monitor volatile contaminants as well as the presence of respirable dust when the soil is physically disturbed by drilling equipment and backhoes. A combustible gas meter and total organic vapor analyzer (HNu) shall be utilized by Consultant personnel to verify field conditions during drilling/excavating operations. Real time monitoring will be performed by consultant personnel on a periodic basis during other on-site activities such as sample collection and reconnaissance surveys. Drager detector-type tubes will be used to measure chemical specific concentrations in air. The level of respiratory and dermal protection in use will be based upon an evaluation of general and chemical specific air monitoring data.

Monitoring instruments will be protected from surface contamination during use to allow for easy decontamination. When not in use, the monitoring instruments will be placed on plastic sheeting to avoid surface contact. Additional monitoring instruments may be required if the situations or conditions change.

During drilling/excavating and soil examination operations, the work area surrounding the borehole will be monitored at regular intervals using an HNu photoionization detector, (or similar organic vapor monitoring device) as well as an explosimeter and a particulate meter. Observed values will then be recorded and maintained as part of the permanent field record. Breathing zone monitoring with an HNu will be performed at two-hour intervals during drilling and continuously during test pit work. The actual frequency of breathing zone monitoring will be dependent primarily upon values generated by screening the cuttings and the proximity of the worker's breathing zones to the source of contamination. Contaminant values which are in excess of established action levels appropriate for the prescribed level of protection will be immediately addressed.

Any split-spoon samples which are collected will be surveyed with the HNu, or similar equipment as each sample is retrieved. These values will be recorded with the respective sample number and will assist in the determination of the adequacy of employee protective equipment. In addition, to minimize dermal contact with potentially contaminated fill/soils, long-handled spoons and knives shall be used during split-spoon sampling and examination of the soil-core sample by the hydrogeologist.

7.2 MONITORING ACTION LEVELS

7.2.1 On-Site Levels

The HNu or other appropriate instrument(s) will be used by either Consultant personnel or the Contractor to monitor organic vapor concentrations as specified in this plan and in the Contractor's Health and Safety Plan. Methane gas will be monitored with the "combustible gas" option on the explosimeter/tritector or other appropriate instrument(s) in accordance with the drilling Contractor's Health and Safety Plan. In addition, fugitive dust/particulate concentrations will be monitored using a real-time particulate monitor, as specified in this plan and in the Contractor's Health and Safety Plan. Readings obtained in the breathing zone may be interpreted (with regard to other site conditions) as follows for on-site Consultant personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to background on the Hnu - Continue Operations Under Level D (see Attachment 1).

- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings above background to 5 ppm on the Hnu (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue Operations Under Level C (see Attachment 1).

- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of 5 to 50 ppm above background on the Hnu - continue operations under Level B (see Attachment 1), re-evaluate and alter (if possible) Work Plan to achieve lower vapor concentrations.

- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the Hnu - discontinue engineering operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during site activities. Action levels based on the instrument readings shall be as follows:

- Less than 10% LEL - Continue engineering operations with caution;

- 10-25% LEL - Continuous monitoring with extreme caution, determine source/cause of elevated reading;

- Greater than 25% LEL - Explosion hazard, evaluate source and leave the Work Zone;

- Less than 19.5% oxygen - leave Work Zone immediately;

- 19.5-25% oxygen - Continue engineering operations with caution; and

- Greater than 25% oxygen - Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities. Action levels based on the instrument readings shall be as follows:

- Less than 150 ug/m^3 - Continue field operations

- Greater than 150 ug/m^3- Don dust/particulate mask or equivalent. Initiate engineering controls (viz. wetting of excavated soils or tools at discretion of Site Health and Safety Officer).

Readings with the explosimeter, particulate monitor and organic vapor analyzer will be recorded and documented in the Health and Safety logbook. All instruments will be maintained

according to the manufacturer's specifications and calibrated before use and the procedure will be documented in the Health and Safety logbook.

7.2.2 Community Air Monitoring

Real-time air monitoring for volatile compounds and particulate levels will be performed at the perimeter of the work area. Volatile compounds will be measured using an HNu or similar device. Drager detector-type tubes which are compound-specific will be used to monitor the perimeter of the work area. For purposes of this monitoring activity the perimeter of the work areas are determined to be 50 feet from the outside edge of the excavation or boring. Air monitoring will occur as follows:

- Volatile organic compounds will be monitored at the downwind perimeter of the work area daily at 2-hour intervals. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. Readings will be recorded and be available for State (DEC and DOH) personnel to review.

- Particulates should be continuously monitored upwind, downwind, and within the work area at temporary particulate monitoring stations. If the downwind particulate level is 150 ug/m^3 greater than the upwind particulate level, then dust suppression techniques must be employed. Readings will be recorded and be available for State (DEC and DOH) personnel to review.

7.2.2.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. The exclusion zone shall be extended to include the area in which the organic vapors exceed 5 ppm above the background. If the organic vapor level decreases below 5 ppm above background, work activities can resume but more frequent intervals of monitoring, as directed by the Safety Officer, must be conducted. If the organic vapor levels are greater than 5 ppm over background, but less than 25 ppm over background at the perimeter of the work area, activities can resume, provided:

- the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background, and

- more frequent intervals of monitoring, as directed by the Safety Officer, are conducted.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down. When work shutdown occurs, downwind air monitoring as directed by the Safety officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

7.2.2.2 Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following the cessation of the work activities or as the result of an emergency, organic levels persist for more than 30 minutes above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-Foot Zone).

If efforts to abate the emission source are unsuccessful and if any of the following levels persist for more than 30 minutes in the 20-Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect if organic vapor levels are approaching 5 ppm above background. However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

7.2.2.3 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health and Safety Plan of the Work Plan will go into effect.

2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.

3. Frequent air monitoring will be conducted at 30-minute intervals within the 20-Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

8.0 HEAT/COLD STRESS MONITORING

Since some of the work activities at the Monitoring Well Decommissioning Sites will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to Consultant employees. Consultant's Site Health and Safety Coordinator or his/her designee will be responsible for monitoring Consultant employees for symptoms of heat/cold stress.

8.1 HEAT STRESS MONITORING

Personal protective equipment may place an employee at risk of developing heat stress, probably one of the most common (and potentially serious) illnesses encountered at hazardous waste disposal sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain equilibrium (via evaporation, convection and radiation), and by its bulk and weight increases energy expenditure.

The signs and symptoms of heat stress are as follows:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
  - muscle spasms
  - pain in the hands, feet and abdomen
- 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 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 and death occur. Competent medical help must be obtained. Signs and symptoms are:

- red, hot, usually dry skin
- lack of or reduced perspiration
- nausea
- dizziness and confusion
- strong, rapid pulse
- coma

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 110 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%.

- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the following work cycle may be further shortened by 33%. Oral temperature should be measured again at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No consultant employee will be permitted to continue wearing semipermeable or impermeable garments when his/her oral temperature exceeds 100.6° Fahrenheit.

8.1 COLD STRESS MONITORING

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frostnip**- This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation.

Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102-108°F) and drinking a warm beverage.

2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish-grey area of tissue which will be firm to the touch but will yield little pain. Treatment is identical to that for Frostnip.

3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard, and will yield little to no pain. Treatment is identical to that for Frostnip.

- **Hypothermia** occurs when the body loses heat faster than it can produce it. The stages of hypothermia (which may not be clearly defined or visible at first) are the following:

1) Shivering
2) Apathy (a change to a disagreeable mood)
3) Unconsciousness
4) Bodily freezing
5) Death (if untreated)

Treatment of hypothermia is given below:

- Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)

- Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine in this case) and a warm water bath (102-108°F)

- Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.

- Personnel should remain active and keep moving.

- Personnel should be allowed to take shelter in a heated area, as necessary.

- Personnel should drink warm liquids (no caffeine or alcohol if frostbite has set in).

9.0 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for drilling, test pit excavation, sample collection, and monitoring well installation will be established by the Contractor on a daily basis and communicated to all employees and other site users by the Contractor's Site Health and Safety Officer. It shall be the Contractor's Site Health and Safety Officer's responsibility to ensure that all site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- **Exclusion Zone ("Hot Zone")** - the area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.0;

- **Contamination Reduction Zone** - the zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated;

- **Support Zone** - the part of the site which is considered non-contaminated or "clean". Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

During drilling operations, Consultant personnel will establish a second exclusion zone immediately upwind of the borehole. Split-spoons shall be brought into this zone to Consultant personnel by the Contractor(s). Sample collection and logging of soil-core samples will be completed in this zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the Contractor. Only personnel who are essential to the completion of the task will be allowed access to these areas and only if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the Contractor's Site Health and Safety Officer.

A log containing the names of workers and their level of protection will be maintained by the Contractor(s).

The zone boundaries may be changed by the Site Health and Safety Officer as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

10.0 DECONTAMINATION PROCEDURES

10.1 PERSONAL DECONTAMINATION FOR MPI EMPLOYEES

The degree of decontamination required is a function of both a particular task and the physical environment within which it takes place. The following decontamination procedure, although somewhat specific to the tasks described herein, will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions which may arise at the site. The procedure shall be followed by all Consultant personnel who are on the site.

Station 1:	Equipment Drop	1. Deposit Equipment used on-site (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination.
Station 2:	Boots and Gloves Wash and Rinse	2. Scrub outer boots and outer gloves with decon solution or detergent water. Rinse off using copious amounts of water.
Station 3:	Tape, Outer Boot and Glove Removal	3. Remove tape, outer boots and gloves. Deposit tape and gloves in container provided by Contractor.
Station 4:	Canister or Mask Change	4. If worker leaves exclusive zone to c hange canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, and worker returns to duty.
Station 5:	Outer Garment Removal	5. Protective suit removed and deposited in separate container provided by Contractor(s).
Station 6:	Face Piece, Hard Hat, Safety Goggles Removal	6. Face piece or safety glasses removed (if used). Avoid touching face with fingers. Facepiece and/or safety glasses deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 7: Inner Glove Removal	7. Inner gloves are the last personal protective equipment to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in container provided by Contractor.

10.2 DECONTAMINATION FOR MEDICAL EMERGENCIES

In the event of a minor, non-life threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (i.e., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a site contaminant would be considered "Immediately Dangerous to Life or Health."

10.3 DECONTAMINATION OF FIELD EQUIPMENT

Decontamination of heavy equipment will be conducted by the Contractor(s) in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone. Heavy equipment and tools utilized during drilling/excavating and monitoring well decommissioning activities will be placed on a decontamination pad and cleaned with high-pressure water followed by steam. Decontamination water will be prevented from moving outside the decontamination pad and will be transferred to a holding tank. The Contractor(s) Health and Safety Officer will make daily inspections to determine that this procedure is being followed. All hazardous chemicals (eg., decon fluids) brought to the site will be properly labeled and their Material Safety Data Sheets will be maintained on-site in accordance with the requirements of 29 CFR 1910-1200.

Decontamination of all tools used for sample collection purposes will be conducted by Consultant personnel. Decontamination fluids will remain within the confines of the deco pad area. Spend fluids will be containerized and prepared for proper off-site disposal. Decontamination of all bailers, split-spoons, spatula knives, and other tools used for multi-media environmental sampling and examination shall be as follows:

- disassemble the equipment;
- water wash to remove all visible foreign matter;
- wash with detergent;

- rinse all parts with distilled-deionized water;
- allow to air dry; and
- wrap all parts in aluminum foil or polyethylene to prevent contamination of clean equipment.

11.0 FIRE PREVENTION AND PROTECTION

11.1 GENERAL APPROACH

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory (DEC) authorities, the Contractor will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper site preparation and safe storage of combustible and flammable materials;
- Availability of coordination with private and public fire authorities;
- Adequate job-site fire protection and inspections for fire prevention; and
- Adequate indoctrination and training of employees.

11.2 EQUIPMENT AND REQUIREMENTS

- Fire extinguishers will be provided by the Contractor(s);
- Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary; and
- Immediately after each use, fire extinguishers will be either recharged or replaced.

11.3 FLAMMABLE AND COMBUSTIBLE SUBSTANCES

- All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons; and
- All tanks, containers and pumping equipment, whether portable or stationary, which are used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the National Fire Protection Association.
- If the LEL exceeds 10% for any compound, fans will be used to dissipate volatile/ combustible gases and to minimize the explosion hazard during drilling/excavation activities. In addition, % O_2/explosive gas monitoring will be conducted throughout the drilling/excavation operations.

ATTACHMENT 1

PROTECTION ENSEMBLES

ATTACHMENT 1

PROTECTION ENSEMBLES

Equipment designed to protect the body against contact with known or anticipated chemical hazards have been divided into four categories according to the degree of protection afforded:

- Level A: Should be selected when the highest level of respiratory, skin and eye protection is needed.

- Level B: Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required; Level B protection is the minimum level recommended on initial site entries until the hazards have been further defined by on-site studies.

- Level C: Should be selected when the types of airborne substances are known, the concentrations have been measured and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.

- Level D: Should not be worn on any site with respiratory or skin hazards. This is primarily a work uniform providing minimal protection.

The level of protection selected is based primarily on:

- Types and measured concentrations of the chemical substances in the ambient atmosphere and their associated toxicity; and

- Potential or measured exposure to substances in air, splashes of liquids or other indirect contact with material due to the task being performed.

In situations where the types of chemicals, concentrations, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgement until the hazards may be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components based on the widely used USEPA Levels of Protection are detailed below for levels B, C, and D protection.

Level B Protection Ensemble

Recommended

- Pressure-demand, full-facepiece self-contained breathing apparatus (MSHA/NIOSH approved) or pressure-demand supplied-air respirator with escape SCBA;
- Saranex chemical-resistant clothing (overalls and long-sleeved jacket; hooded one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit); disposable chemical-resistant one-piece suit);
- Inner and outer chemical resistant gloves (silver shell);
- Chemical-resistant latex safety boots/shoes; and
- Hard hat.

Optional

- Coveralls.
- Disposable boot covers.
- Face shield.
- Long cotton underwear.

Meeting any one of the following criteria warrant the use of Level B protection:

The types and atmospheric concentrations of toxic substances have been identified and require the highest level of respiratory protection, but a lower level of skin and eye protection. These would be atmospheres:

- with concentrations Immediately Dangerous to Life and Health (IDLH)
- exceeding limits of protection afforded by a full-face air-purifying mask;
- containing substances for which air-purifying canisters do not exist or have low removal efficiency;
- containing substances requiring air-supplied equipment, but substances and/or concentrations do not represent a serious skin hazard;
- containing less than 19.5% oxygen; or

- with evidence of incompletely identified vapors or gases as indicated by direct reading organic vapor detection instrument, but those vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

Level B equipment provides a high level of protection to the respiratory tract, but a somewhat lower level of protection to skin. The chemical-resistant clothing required in Level B is available in a wide variety of styles, materials, construction detail and permeability. These factors all affect the degree of protection afforded. Therefore, a specialist should select the most effective, chemical-resistant clothing based on the known or anticipated hazards and task. Level B skin protection is selected by:

- Comparing the concentrations of identified substances in the air with skin toxicity data;
- Assessing the effect of the substance (at its measured air concentrations or splash potential) on the small area of the head and neck unprotected by chemical-resistant clothing.

Level C Protection Ensemble

Recommended

- Full-facepiece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the Health and Safety Manager;
- Chemical-resistant clothing (polycoated Tyvek overalls and long-sleeved jacket, hooded, one- or two-piece chemical splash suit or disposable chemical-resistant one-piece suit);
- Inner and outer chemical-resistant gloves (butyl/nitrile);
- Chemical-resistant latex safety boots/shoes; and
- Hardhat.

Optional

- Coveralls;
- Disposal boot covers;
- Face shield;
- Escape mask;
- Long cotton underwear.

The use of Level C protection is permissible upon satisfaction of these criteria:

- Measured air concentrations of identified substances will be reduced by the respirator to below the substance's permissible exposure limit (PEL), threshold limit value (TLV), and/or the concentration is within the service limit of the cartridge;
- Atmospheric contaminant concentrations do not exceed IDLH levels; and
- Atmospheric contaminants, liquid splashes or other direct contact will not adversely affect the small area of skin left unprotected by chemical-resistant clothing.

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances encountered. Respiratory protection will be used only with proper fitting, training and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if:

- Oxygen content of the atmosphere is at least 19.5% in volume;
- Substances are identified and concentrations measured;
- Substances have adequate warning properties;
- Individual passes a qualitative fit-test for the mask; and
- Appropriate cartridge/canister is used, and its service limit concentration is not exceeded.

An air monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

Level D Protection Ensemble

Recommended

- Tyvek coveralls;
- Safety boots/shoes;
- Safety glasses or chemical splash goggles;

- Hardhat;
- Latex gloves.

Optional

- Gloves;
- Escape mask;
- Face shield.

The use of Level D protection is permissible upon satisfaction of these criteria:

- No hazardous air pollutants have been measured; and
- Work functions preclude splashes, immersion or the potential for unexpected inhalation of any chemicals; and
- Atmospheric contains at least 19.5% oxygen.

Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, or where there are no inhalable toxic substances.

ATTACHMENT 2

CONTINGENCY PLAN AND HOSPITAL ROUTE

(to be developed on a site-specific basis)

ATTACHMENT 2

This attachment presents an example of an emergency response plan for a site in the Love Canal, NY area. A similar plan will need to be developed for each site where well decommissioning activities are to be performed.

Personnel Exposure

- Skin contact: Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Niagara Falls Memorial Hospital.

- Inhalation: Move to fresh air and, if necessary, transport to Niagara Falls Memorial Hospital.

- Ingestion: Decontaminate and transport to Niagara Falls Memorial Hospital.

Personal Injury

Minor first-aid will be applied on-site as deemed necessary. In the event of a life threatening injury, the individual should be transported to Niagara Falls Memorial Hospital via ambulance. The Consultant and Subcontractor Health and Safety Officers will supply available chemical-specific information to appropriate medical personnel as requested.

The consultant or subcontractor first aid kits will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually-sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the On-Site Health and Safety Coordinator to ensure that the expended items are replaced.

Communications

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Hand signals and air-horn blasts are also commonly used. It shall be the responsibility of the Subcontractor's Site Health and Safety Officer to ensure that an adequate method of internal communication is understood by all personnel entering the site. Unless all personnel are otherwise informed, the following signals shall be used.

1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site excavation.

2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/ everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

Evacuation

In the event that an area must be evacuated due to an emergency, such as a chemical spill or a fire, workers shall exit upwind, if possible. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the Subcontractor's Site Health and Safety Officer to review evacuation routes and procedures as necessary and to inform all site workers of any charges.

Adverse Weather Conditions

In the event of adverse weather conditions, the Consultant's Site Health and Safety Coordinator in conjunction with the Consultant's Health and Safety Officer will determine if engineering operations can continue without sacrificing the health and safety of the Consultants employees. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat/cold stress;
- Inclement weather - related working conditions;
- Limited visibility; and
- Potential for electrical storms.

Emergency Telephone Numbers

PROJECT MANAGER:

CORPORATE HEALTH AND SAFETY MANAGER:

SITE HEALTH AND SAFETY OFFICER:

SITE HEALTH AND SAFETY COORDINATOR:

NIAGARA FALLS MEMORIAL HOSPITAL:	(716) 278-4000
FIRE	911 (Local) 285-1234
AMBULANCE	911 or 285-3663
POLICE	911 (Local) 286-4711
ON-SITE CELLULAR TELEPHONE	(716) 866-4367

The site location is:
Love Canal Site
Military Road
Niagara Falls, New York

Nearest Trauma Center:
Children's Hospital of Buffalo
219 Bryant Street
Buffalo, New York
Dr. James Allen (716) 878-7953

Directions to Hospital

The following directions describe the most efficient route to Niagara Falls Memorial Hospital (see Figure A-1):

(1) From the Site, turn right onto Military Rd. and proceed north to Pine Ave.

(2) Turn left (west) onto Pine Avenue and proceed to 10th Street.

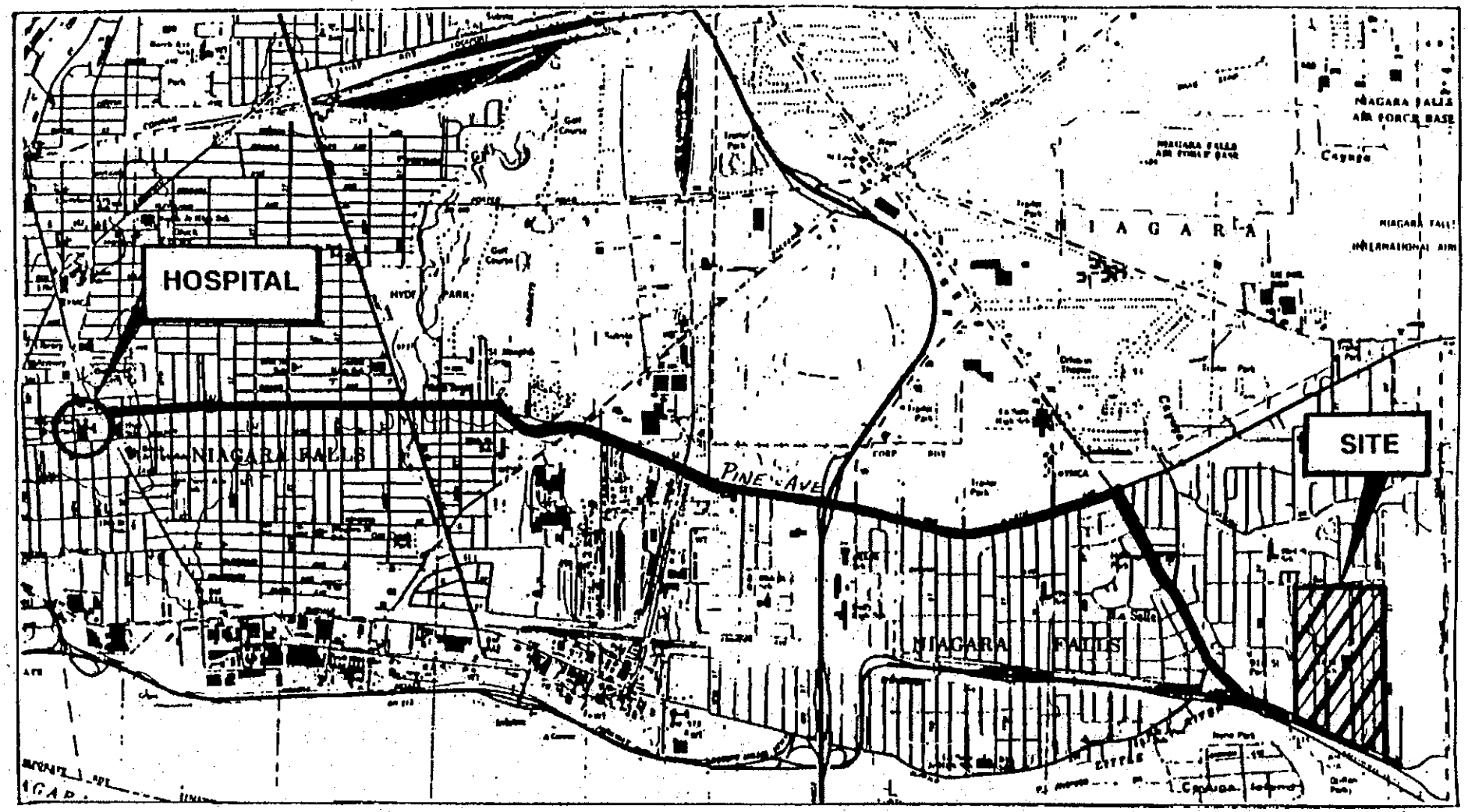
(3) Turn left (south) onto 10th St. and proceed for approximately one-tenth (1/10) mile.

(4) Hospital is on the left side of road (601 10th St.)

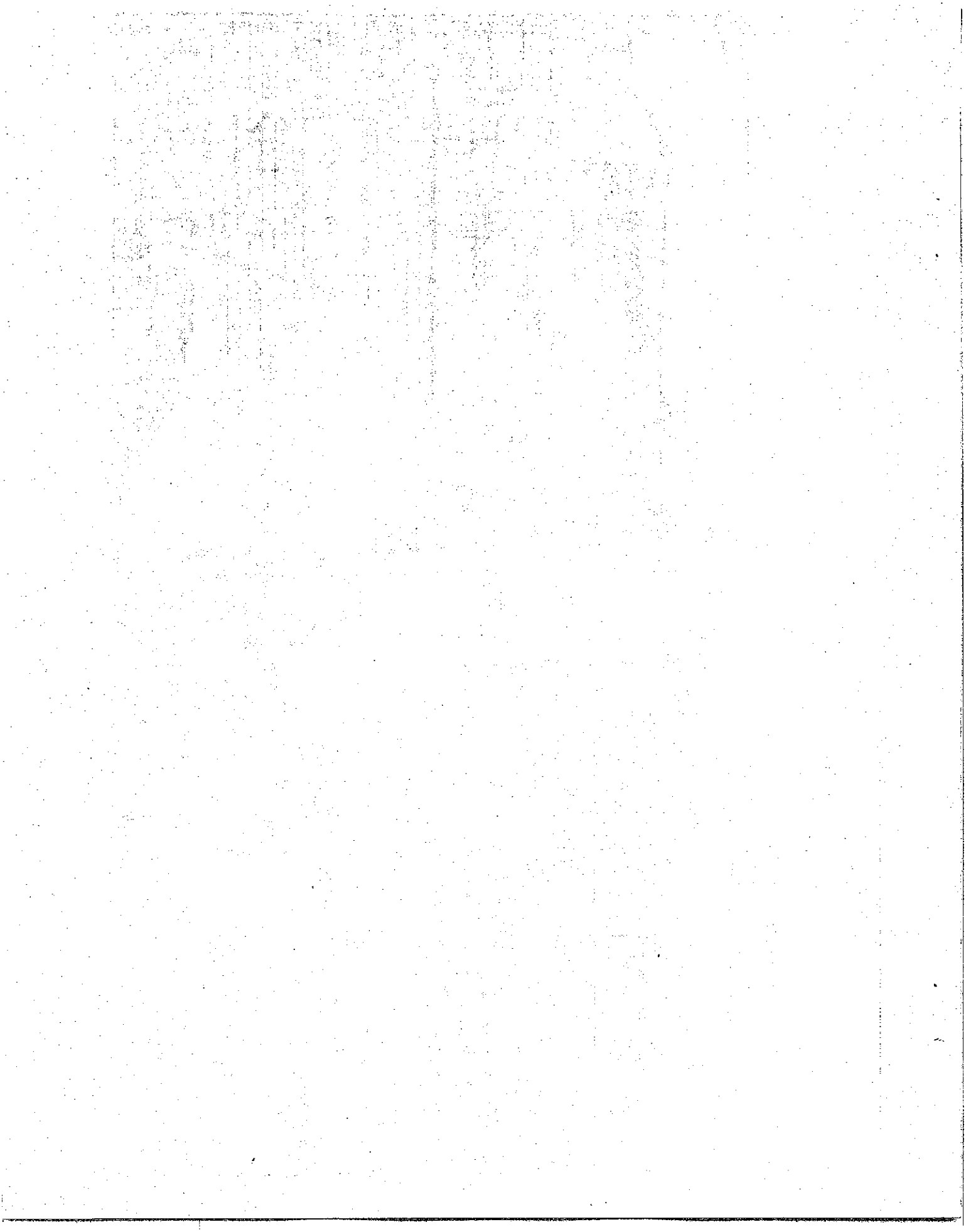
Records and Reporting

It shall be the responsibility of each employer to establish and assure adequate records of all:

- Occupational injuries and illnesses;
- Accident investigations;
- Reports to insurance carrier or State compensation agencies;
- Reports required by client;
- Records and reports required by local, state, federal and/or international agencies;
- Property or equipment damage;
- Third party injury or damage claims;
- Environmental testing logs;
- Explosive and hazardous substances inventories and records;



HOSPITAL ROUTE



APPENDIX B

EQUIPMENT DECONTAMINATION SOPs

Appendix B : Item 1 - DECONTAMINATION FACILITY CONSTRUCTION

Applicability: GENERAL Revision No.: ____ Date: _____

Prepared By: NWT Date: 02/02/90 Approved By: GHF Date: 02/02/90

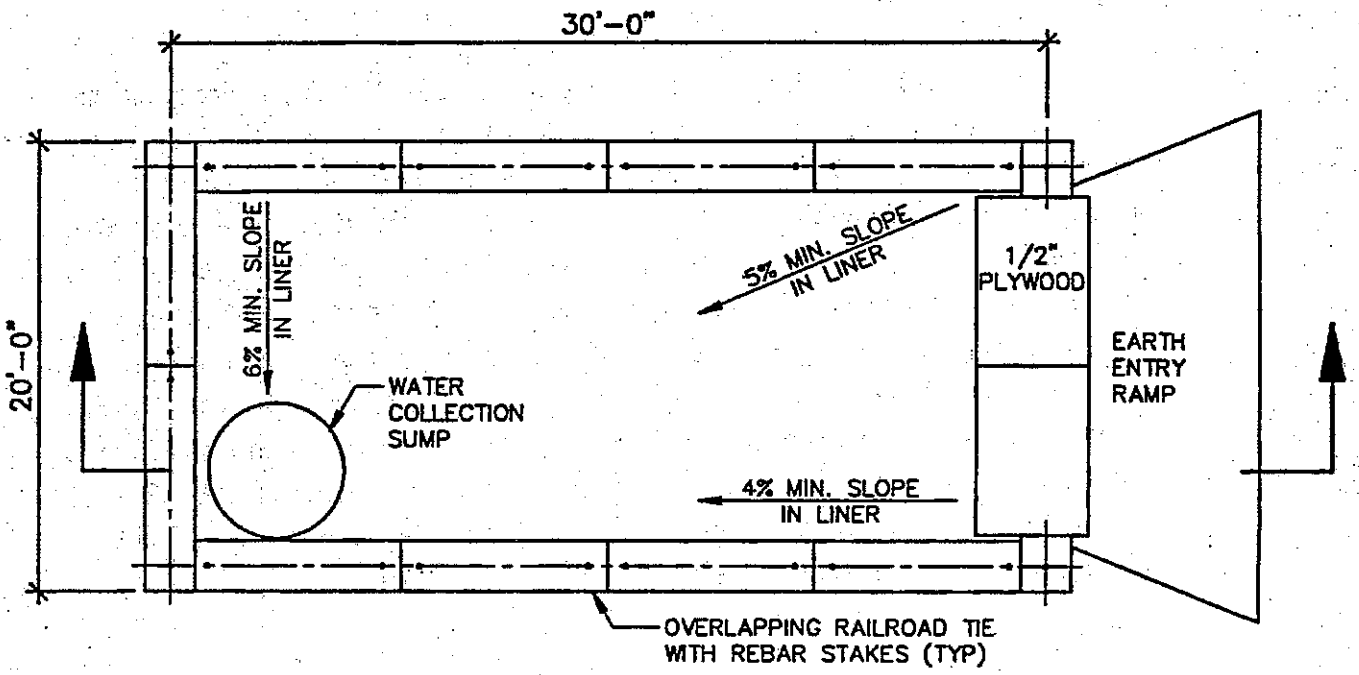
1.0 INTRODUCTION

This guideline presents the construction details for a decontamination facility (i.e., decon pad or wash pad) to be used for the decontamination of drilling and excavation equipment (i.e., drill rigs, backhoes, augers, cutting bits, drill steel, buckets, and associated equipment). A synthetic liner will be installed under the pad for leak and spill protection. In addition, the pad will be constructed with an integral sump to allow for removal of collected liquids. The surface of the liner will be sloped to direct gravity drainage towards a sump. Liquids collected in the sump will be pumped out as necessary and stored in containers until final disposition according to State and Federal regulations. In addition, the decon pad will be covered by a tarp to preclude the collection of precipitation in the sump.

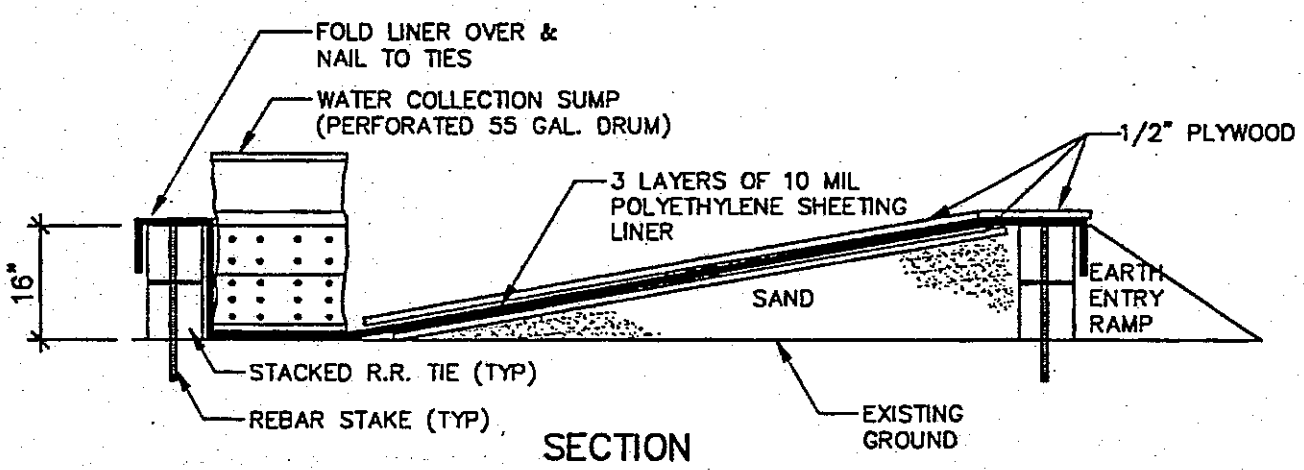
APPENDIX B : ITEM 1 – DECONTAMINATION FACILITY CONSTRUCTION

APPLICABILITY: GENERAL REVISION NO.: DATE:

PREPARED BY: DATE: APPROVED BY: DATE:



PLAN VIEW
NOT TO SCALE



SECTION
NOT TO SCALE

Appendix B : Item 2 - DRILLING/EXCAVATION EQUIPMENT DECONTAMINATION PROTOCOLS

Applicability: GENERAL Revision No.: 1 Date: 10/8/90

Prepared By: NWT Date: 12/20/89 Approved By: GHF Date: 02/02/90

1.0 INTRODUCTION

This guideline presents a method for the decontamination of drilling and excavation equipment (i.e., drill rigs, backhoes, augers, cutting bits, drill steel, buckets, and associated equipment) used during a subsurface investigation. Equipment will be decontaminated at an established and clearly demarcated decontamination facility (see appropriate guideline) prior to initiating surface penetration of each boring/excavation (drill equipment cleaning is not required between wells of the same nest). This will prevent cross-contamination from the previous drilling/excavation location.

2.0 METHODOLOGY

1. Remove all soil/rock material from the equipment at the survey site.
2. Wrap augers, tools, plywood, and other reusable items with a plastic cover prior to transport from the survey site to the decontamination facility.
3. Transport equipment to the decontamination facility.
4. Wash equipment thoroughly with pressurized low-volume water or steam (power washer or steam jenny) using a wire brush to remove visible soils/etc. adhering to the equipment.
5. Use phosphate-free detergent (e.g., Alconox) to remove any oils, grease, and/or hydraulic fluids adhering to the equipment.
6. Rinse with pressurized low-volume water or steam.

7. Allow equipment to air dry.

8. Wrap with clean plastic or aluminum foil, if appropriate, to prevent contamination if equipment is going to be stored or transported.

9. Fluids used for decontamination will not be recycled. Store all wash water, rinse water, and decontamination fluids in containers until final disposal requirements are determined.

10. Following final rinse, inspect openings to verify they are fee of soil/etc. particulates which may contribute to possible cross-contamination.

3.0 REFERENCES

(a) USEPA Region IV Engineering Support Branch. 1986. Standard Operating Procedures and Quality Assurance Manual.

072

Appendix B : Item 3 - SAMPLING EQUIPMENT DECONTAMINATION PROTOCOLS

Applicability: NYSDEC-SPECIFICATION Revision No.: 3 Date: 10/9/90

Prepared By: AJM Date: 10/31/89 Approved By: KLB Date: 12/12/89

1.0 INTRODUCTION

This guideline presents a method for the decontamination of sampling equipment used in the collection of environmental samples.

2.0 HEALTH AND SAFETY

Nitric acid is a strong oxidizing agent as well as being extremely corrosive to the skin and eyes. Solvents such as acetone, methanol, hexane, and isopropanol are flammable liquids. Limited contact with skin can cause irritation, while prolonged contact may result in dermatitis. Eye contact with the solvents may cause irritation or temporary corneal damage. Safety glasses with protective side shields, neoprene or nitrile gloves, and long-sleeve protective clothing must be worn whenever acids and solvents are being used.

3.0 METHODOLOGY

1. All equipment used in sampling must be clean and free from residue of any previous samples. To accomplish this, the following procedures are to be followed:

   a. wash equipment thoroughly with non-phosphate detergent and tap water[1] using a brush to remove any particulate matter or surface film;

   b. rinse with tap water[1];

   c. rinse with a 10% HNO_3 solution[2];

d. rinse with tap water[1];

e. rinse with deionized water (demonstrated-analyte-free)[3];

f. air dry; and

g. wrap in aluminum foil (shiny side out)

2. Well evacuation equipment, such as submersible pumps and bailers, which are put into the borehole must be decontaminated following the procedures listed above. All evacuation tubing must be dedicated to individual wells, (i.e., tubing cannot be reused).

3. Bailer cord must be cleaned with non-phosphate detergent and demonstrated analyte-free deionized water before use. Cord can be reused; it is not necessary to dedicate it to individual wells. If a ten (10) foot or greater length leader is being used, only the leader need be cleaned (assumes bailer cord is not allowed to contact water).

4. All unused sample bottles and sampling equipment must be maintained in such a manner that there is no possibility of casual contamination.

4.0 EQUIPMENT REQUIREMENTS

- personal protective garment and gear
- brush, buckets, and wash basins
- squirt bottles
- supply of solvents and water
- aluminum foil

5.0 REFERENCES

New York State Department of Environmental Conservation, Division of Hazardous Substances Regulation, August 1989, RCRA Quality Assurance Project Plan Guidance.

Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, April 1, 1986. USEPA Region IV.

NOTES

(1) Tap water may be used from any municipal water treatment system. The use of an untreated potable water supply is not an acceptable substitute.

(2) Omit this step if metals are not being analyzed. For carbon steel split spoon samplers, a 1% rather than 10% HNO_3 solution should be used.

(3) Deionized water must be demonstrated to be analyte-free water. The criteria for analyte-free water are the Method Detection Limits (MDLs) for the analytes. Specifically for the common laboratory contaminants listed below, the allowable limits are set at three times the respective MDLs determined by the most sensitive analytical method:

1. Methylene Chloride
2. Acetone
3. Toluene
4. 2-Butanone
5. Phthalates

APPENDIX C

CONSTRUCTION INSPECTION FORMS

Inspector's Daily Report

CONTRACTOR:
ADDRESS:

TELEPHONE:
LOCATION _____ FROM _____ TO _____
WEATHER _____ TEMP _____ A.M. _____ P.M. _____ DATE _____

CONTRACTOR'S WORK FORCE AND EQUIPMENT											
DESCRIPTION	*H*	*#*	*DESCRIPTION*	*H*	*#*	*DESCRIPTION*	*H*	*#*	*DESCRIPTION*	*H*	*#*
Field Engineer						Equipment			Front Loader Ton		
Superintendent			Ironworker			Generators			Bulldozer		
						Welding Equip.					
Laborer-Foreman			Carpenter								
Laborer									Backhoe		
Operating Engineer			Concrete Finisher								
Carpenter						Paving Equip. & Roller					
						Air Compressor					

SEE REVERSE SIDE FOR SKETCH ☐YES ☐NO
WORK PERFORMED:

PAY ITEMS:

CONTRACT		STA		DESCRIPTION	QUANTITY	REMARKS
NO.	ITEM	FROM	TO			

TEST PERFORMED:
PICTURES TAKEN:
VISITORS:

QA PERSONNEL
SIGNATURE
REPORT NO.
SHEET _____ of _____

MEETINGS HELD & RESULTS:

REMARKS:

REFERENCES TO OTHER FORMS:

SKETCHES

SAMPLE LOG

SAMPLE NUMBER:

APPROXIMATE LOCATION OF STOCKPILE:

NUMBER OF STOCKPILE:

DATE OF COLLECTION:

CLIMATOLOGIC CONDITIONS:

FIELD OBSERVATION:

PROBLEM IDENTIFICATION REPORT

FORM H

DATE ______________________

DAY	S	M	T	W	TH	F	S

Project ______________________ Job No.__________

Contractor______________________________

Subject ______________________________

WEATHER	Brite Sun	Clear	Overcast	Rain	Snow
TEMP.	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder.	High	Report No.	
HUMIDITY	Dry	Moder.	Humid		

PROBLEM DESCRIPTION (Reference Daily Report No.): ______________________________

____

____

____

PROBLEM LOCATION - REFERENCE TEST RESULTS AND LOCATION (Note: Use sketches on back of form as appropriate): ______________________________

____

____

____

PROBABLE CAUSES: ______________________________

____

____

____

SUGGESTED CORRECTIVE MEASURES: ______________________________

____

____

____

APPROVALS:

QA ENGINEER: ______________________________

PROJECT MANAGER: ______________________________

DISTRIBUTION:
1. Proj. Mgr.
2. Field Office
3. File
4. Owner

QA Personnel Signature ______________________

Wiley-Fisk Form 8-3

CORRECTIVE MEASURES REPORT

FORM I

DATE _____

DAY | S | M | T | W | T-H | F | S |

Project _____ Job No. _____

Contractor _____

Subject _____

WEATHER

TEMP.

WIND

HUMIDITY

CORRECTIVE MEASURES UNDERTAKEN (Reference Problem Identification Report No.): _____

RETESTING LOCATION: _____

SUGGESTED METHOD OF MINIMIZING RE-OCCURRENCE: _____

APPROVALS:

QA ENGINEER: _____

PROJECT MANAGER: _____

DISTRIBUTION: 1. Proj. Mgr.
2. Field Office
3. File
4. Owner

QA Personnel
Signature _____

Wiley-Fisk Form 8-3

APPENDIX D

HYDRAULIC PRESSURE TESTING SOP

Appendix D : Item 1 - HYDRAULIC PRESSURE TESTING OF SCREENED INTERVAL

Applicability: HAZARDOUS WASTE Revision No.: ____ Date: _____

Prepared By: BGP Date: 4/28/95 Approved By: ___ Date: _____

1.0 INTRODUCTION

This guideline presents a method for evaluating the integrity of a grout seal in the screened interval of a well being decommissioned by grouting in place.

2.0 METHODOLOGY

1. Grout the screened interval of the well using a tremie pipe, up to a level of one to two feet above the screened section.

2. Allow the grout to set for a period of not less than 24 hours and not greater than 72 hours before pressure testing of the grouted interval is begun.

3. Place a pneumatic packer at a maximum of four and one half feet above the top of the screened section of the well casing.

4. Apply an inflation pressure to the packer, not exceeding the pressure rating of the well casing material. If the interval between the top of the grout and the bottom of the packer is not saturated, use potable water to fill the interval.

5. Apply a gauge pressure of 5 psig at the well head to the interval for a period of 5 minutes to allow for temperature stabilization. After 5 minutes maintain the pressure at 5 psig for 30 minutes.

6. The grout seal shall be considered acceptable if the total loss of water to the seal does not exceed 0.5 gallons over a 30-minute period.

7. If the grout seal is determined to be unacceptable, an additional 5 feet of grout will be added to the well casing with a tremie pipe. The interval will be retested as described above.

110