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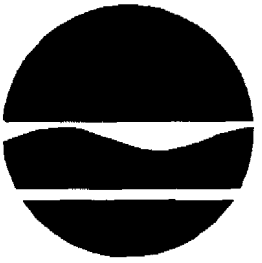
SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

# HEALTH AND SAFETY PLAN
## FOCUSED REMEDIAL INVESTIGATION
## PALL CORPORATION SITE

Site No. 1-30-053B
Work Assignment Number
D003060-19



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February, 1998

**PALL CORPORATION**
**HEALTH AND SAFETY PLAN**
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# 1.00 INTRODUCTION

## 1.10 OVERVIEW

This Site-Specific Health and Safety Plan (HASP) has been developed by GZA GeoEnvironmental of New York (GZA) to establish the health and safety procedures required to protect on-site personnel, and off-site receptors from potential hazards resulting from activities within the specified scope at the Pall Corporation (Pall) in Glen Cove, Nassau County, New York. The Site is a New York State Department of Environmental Conservation (NYSDEC) Class 2 Inactive Hazardous Waste Site, Site Code 1-30-053B. The provisions of this plan apply to all GZA personnel who may be exposed to safety and/or health hazards related to activities described in Section 3.00 of this document. The procedures in this plan have been developed based on current knowledge regarding the hazards which are known or anticipated for the operations to be conducted at this site.

The following sections (1.10.1 to 1.20) present a brief summary of information from the body of this HASP. This information is intended as a guide to assist the reader and is not intended to be all inclusive.

### 1.10.1 Project Scope

This project involves auger probes, Geoprobes, piezometer installation, groundwater sampling, surface water sampling, surface water sediment sampling and surveying. The exclusion zones are expected to be variable and temporary in accordance with planned daily activities.

### 1.10.2 Site Hazards

The primary hazards anticipated at the site are the physical hazards associated with operation of mechanical equipment (i.e., Geoprobe rig,), including noise. However, since GZA personnel will not be involved with the actual operation of large mechanical equipment (i.e., Geoprobe rig) or direct supervision of Geoprobe rig crew, exposure to these hazards by GZA personnel can be controlled by keeping a safe distance from heavy equipment.

Inhalation hazards may result from the presence of chlorinated solvents (tetrachloroethene {PCE}, trichloroethene {TCE} etc.) and their associated degredation products (vinyl chloride {VC} etc.)

### 1.10.3 Levels of Protection

Non-intrusive activities (surveying) described within the scope of this HASP will require Level D protection. Intrusive activities (existing well assessment, auger probes, Geoprobes, piezometer installation, groundwater sampling, surface water sampling, surface

water sediment sampling) will require Level D protection with potential upgrade to Level C based on air monitoring and observed site conditions.

## 1.20 PROJECT TEAM

The personnel responsible for the completion of this project and monitoring compliance with this HASP are:

| Name | Project Title/Assigned Role | Phone Numbers |
|---|---|---|
| Ernest R. Hanna | Principal-in-Charge | (716) 685-2300 |
| Raymond Laport/Ed Knyfd | Task Leader | (716) 685-2300/ (973) 256-7800 |
| Steve Vallianos | Field Team Leader/Site Safety Officer (SSO) | (973) 256-7800 |
| Donald Redpath | Corporate Health and Safety Director | (617) 630-6292 |

Activities covered in this HASP must be conducted in complete compliance with this document and with all applicable federal, state and local health and safety regulations, including 29 CFR 1910.120. Each GZA on-site employee must sign a copy of the HASP Orientation Verification Form (included in Appendix A) verifying that he or she has read it and understands its requirements. Personnel covered by this HASP who cannot or will not comply must be excluded from site activities.

All subcontractors must develop their own HASP related to their on-site activities. Subcontractors may use GZA's HASP for informational purposes when developing their own HASP. However, subcontractors are responsible for determining their HASPs adequacy and applicability to their on-site activities. Subcontractors must deliver their HASP in clear written form to TAMS prior to the initiation of on-site activities.

# 2.00 SITE DESCRIPTION AND HISTORY

The Site is located in the Sea Cliff Avenue Industrial Area which has been documented as an area of variable industrial use from the 1940s to the present. Pall Corporation has operated the facility at Sea Cliff Avenue since the early 1950s. The Pall Corporation facility is currently used as a research and development facility for the manufacture of filtration

products. The August Thomsen property was owned by the Pall Corporation until 1971, when August Thomsen bought the property. During the period that the Pall Corporation owned the August Thomsen property, it was used by its subsidiary, Glen Components, Inc., as a precision machine shop providing parts to Pall's other divisions, primarily Aircraft Porous Media, Inc.

Based on a Pall report, there are no chlorinated solvents currently being used at the Site. In the past, chlorinated solvents were used at the Site until approximately 1971.

Industrial activities have occurred in the past and are currently occurring on neighboring properties which include Photocircuits Corporation, Pass and Seymour (currently owned by Photocircuits), and Associated Draperies. These industrial properties are subject to NYSDEC regulatory enforcement action. The Pall Corporation, August Thomsen, Photocircuits Corporation, and the former Pass and Seymour properties are listed as Class 2 Inactive Hazardous Waste Disposal Sites (IHWDS) by the NYSDEC. Associated Draperies is listed as a NYSDEC Spills site.

Compounds detected in the site samples include: vinyl chloride, chlorobenzene, chloroethane, chloroform, methylene chloride, acetone, 2-butanone, 1,1-dichloroethene, 1,1-dichloroethane, 1,2-dichloroethene (total), 1,1,1-trichloroethane, 1,2-dichloroethane, trichloroethene, 1,1,2-trichloroethane, benzene, and perchloroethylene. Historic concentrations of these compounds in groundwater samples are presented on Table 1.

## 3.00 SCOPE OF WORK

Field activities during this investigation shall be comprised of intrusive activities and non-intrusive activities. Non intrusive activities are survey type activities and are not expected to result in significant exposure to contamination. Intrusive activities are those activities which may result in handling or boring of potentially contaminated materials. The field activities planned are briefly described below, additional details are included in the field activity plan.

### 3.10 NON-INTRUSIVE ACTIVITIES

#### 3.10.1 Survey

A licensed land surveyor will be subcontracted to measure the vertical and horizontal locations of the new and existing monitoring wells and borings, soil gas probes, test pits, Geoprobes, limits of the property and selected site features.

## 3.20 INTRUSIVE ACTIVITIES

### 3.20.1 Existing Well Assessment

This assessment will be done to determine the condition of existing on-site wells for future monitoring. This task will include opening the well, measuring water levels, measuring the total depth and purging. The top of the well riser will be screened for the presence of VOCs and explosive gases upon initial opening of each well and the purge water will be screened during well development. This task will be done by GZA/TAMS personnel.

### 3.20.2 Auger Probes

Shallow auger probes will be completed in an existing site building. A rotary hammer drill will be used to make a 1 1/4 inch hole in the concrete floor. A pre-cleaned hand auger will be used to collect soil samples from 1 to 2 feet below the floor slab. This task will be done by GZA/TAMS personnel.

### 3.20.3 Geoprobes

The nature and extent of unsaturated subsurface soil contamination will be further assessed by completing about 55 Geoprobe soil borings at the Site. The Geoprobe boring holes will be advanced into the overburden and soil samples will be collected using a truck mounted Geoprobe unit equipped with a two inch OD by four foot long sampler. The Geoprobe unit includes a hydraulic push/hammer that is used to advance the sampler. Geoprobe borings will be advanced to about 8 to 20 feet (shallow probes) and about 40 feet (deep probes). The soil samples will be screened during sampling by GZA/TAMS personnel with an organic vapor meter. Geoprobe holes will be backfilled with mix of soil and bentonite clay. The Geoprobe unit will be operated by a subcontractor and GZA/TAMS personnel will not be involved with the actual operation of drilling equipment.

### 3.20.4 Piezometer Installations

Selected Geoprobe holes will have piezometers installed in them. The piezometers consist of ¾ inch flush couple PVC casing. Protective (road box type) covers will be placed over the installed piezometers. The piezometers will be installed by a subcontractor and GZA/TAMS personnel will not be involved with the actual operation of Geoprobe unit during installation.

### 3.20.5 Groundwater, Surface Water and Surface Water Sediment Sampling

GZA/TAMS will collect groundwater samples from existing monitoring wells and from Geoprobe bore holes and submit them to an analytical laboratory for testing. GZA/TAMS will screen the well casing for the presence of VOCs using an organic vapor

meter prior to sampling. GZA/TAMS will collect three surface water and surface water sediment samples along Glen Cove Creek (adjacent to the Site).

## 4.00 HAZARD ASSESSMENT

The following chemical, physical, and biological hazard assessment applies only to the activities within the specified scope of this HASP.

### 4.10 CHEMICAL HAZARDS

Based on the information provided to GZA, the chemical hazards anticipated on site are those associated with chlorinated solvents (e.g., PCE and TCE). The actual associated hazards are not known but may include the following:

#### 4.10.1 Volatile Organic Compounds

Exposure to the vapors of many volatile organic compounds above their respective permissible exposure limits (PELs), as defined by the Occupational Safety and Health Administration (OSHA), may produce irritation of the mucous membranes of the upper respiratory tract, nose and mouth. Overexposure may also result in the depression of the central nervous system. Symptoms of such exposure include drowsiness, headache, fatigue and drunken-like behavior. Some volatile organic compounds are considered to be potential human carcinogens.

The vapor pressures of many of these compounds are high enough to generate significant quantities of airborne vapor. On sites where high concentrations of these compounds are present, this can result in a potential inhalation hazard to the field team during subsurface investigations. To reduce the potential for exposure to the vapors of the organic compounds of concern, respiratory protection may be required. Because this site is open and the anticipated quantities of contamination are small, overexposure potential is expected to be small.

Previous studies and historical information indicated that chlorinated solvents (TCE, PCE, etc.) are present at the site.

#### 4.10.2 Chlorinated Organic Compounds

Exposure to vapors of many chlorinated organic compounds such as vinyl chloride, tetrachloroethene, 1,1,1 trichloroethane, trichloroethene and 1,2 dichloroethene above their respective PELs will result in similar symptoms. Exposure to chlorinated compounds can cause symptoms such as irritation of the eyes, nose and throat. Over exposure may also result is symptoms such as drowsiness, dizziness, headache, etc. Skin contact with the liquid may cause dermatitis. If splashed in the eyes, the liquid may cause burning, irritation and

damage. Vinyl chloride is a known carcinogen.

4.10.3 Methane

Methane is an odorless, colorless, tasteless gas, and is a significant fire and explosion hazard. It also acts primarily as a simple asphyxiate when present in high concentrations. Methane has a lower explosive limit (LEL) of 5% and an Upper explosive limit of 15%.

4.10.4 Chemicals Subject to OSHA Hazard Communication

All chemicals brought on site such as solvents, reagents, decontamination solutions, or any other hazardous chemical must be accompanied by the required labels, Material Safety Data Sheets (MSDS), and employee training documentation (OSHA 1910.1200). GZA will maintain these documents on site. For additional information refer to the GZA Hazard Communication Program contained in GZA's Health and Safety Program Manual.

## 4.20 PHYSICAL HAZARDS

All personnel on site should be provided with the information and training necessary to avoid accidental injury. This includes assuring that the site is maintained in such a way that slip, trip and fall hazards as well as cut, puncture and abrasion hazards such as nails, scrap metal, rusted containers and construction derbies are recognized and eliminated or controlled. Basic personal protective equipment must be available and its use enforced.

4.20.1 Construction Hazards (Geoprobe Rigs, etc.)

The use of Geoprobe rigs and other heavy equipment represent potentially serious construction hazards. Whenever such equipment is used, personnel in the vicinity should be limited to those who must be there to complete their assigned duties. All personnel must avoid standing within the turning radius of the equipment or below any suspended load. Job sites must be kept as clean, orderly and sanitary as possible. When water is used, care must be taken to avoid creating muddy or slippery conditions. If slippery conditions are unavoidable, barriers and warning signs must be used to warn of these dangers.

Never turn your back to operating machinery. Never wear loose clothing, jewelry, hair or other personal items around rotating equipment or other equipment that could catch or ensnare loose items. Always stand far enough away from operating machinery to prevent accidental contact which may result from mechanical or human error.

Safety switches on the drill rig shall be tested before beginning work.

Additionally, the following basic personal protective measures must be observed: Hard Hats must be worn to protect against bumps or falling objects. Safety glasses must be worn by all workers in the vicinity of Geoprobe rigs or other sources of flying objects.

Goggles, face shields or other forms of eye protection must be worn when necessary to protect against chemicals or other hazards. Steel toed safety shoes or boots are also required. The shoes must be chemically resistant or protected with appropriately selected boots/coverings where necessary. Unless otherwise specified, normal work clothes must be worn. Gloves are also required whenever necessary to protect against hazardous contact, cuts, abrasions or other possible skin hazards.

4.20.2 Trenching and Excavation

OSHA requires that a competent person, who is trained to recognize the hazards associated with trenching and excavating activities and has authority to control these hazards within the limits established by OSHA Trenching and Excavation Standard (29 CFR 1926.650-652) be present at all times. Trenching and excavating will be done by a subcontractor. GZA personnel involved in these activities will be in accordance with GZA Trench and Excavation Safety and Health Guide contained in GZA's Health and Safety Program Manual. GZA will maintain a copy of this guide on-site. Trenching and Excavation are not included in the current scope of work.

4.20.2.1 Drums and Buried Drums

As a precautionary measure, personnel must assume that labeled and unlabelled drums encountered during field activities contain hazardous materials until their contents can be confirmed and characterized. Personnel should recognize that drums are frequently mislabeled, particularly drums that are reused.

Only trained and authorized personnel should be allowed to perform drum handling. Prior to any handling, drums must be visually inspected to gain as much information as possible about their contents. Trained field personnel must look for signs of deterioration such as corrosion, rust or leaks, and for signs that the drum is under pressure such as swelling or bulging. Drum type and drumhead configuration may provide the observer with information about the type of material inside, (i.e., a removable lid is primarily designed to contain solids, while the presence of a bung indicates liquid storage).

Although not usually anticipated, buried drums can be encountered when conducting subsurface work. Therefore, the following provisions must be observed if drums are encountered. Machine excavation (i.e. Geoprobe rig) should cease immediately anytime an unknown void (possible drum) is encountered. The appropriate management personnel should be notified immediately.

Sampling of unknown drums usually requires Level B protection. Buried drums must not be moved unless it can be accomplished in a safe manner and overpack drums are available. Contacting/disturbing drums is not included in the scope of work for this project.

4.20.3 Fire and Explosion

The possibility of flammable materials being encountered during field activities must be recognized. And, the appropriate steps necessary to minimize fire and explosion must be observed. This includes situations where excessive organic vapors or free product are encountered. When this occurs, monitoring with a combustible gas indicator (CGI) and organic vapor meter, is required.

Excessive organic vapors can cause an explosion hazard. Therefore, whenever excessive organic vapors are detected using an organic vapor meter (OVM), monitoring should be done for the presence of explosive gases.

In situations where hexane, methanol are needed for field activities, the following precautions must be observed: Keep flammable and combustible materials away from heat, sparks and open flames. Do not smoke around flammable or combustible materials (no smoking will be allowed on site). Keep all flammable and combustible liquids in approved and properly labeled safety containers.

Fire, explosion and hazardous chemical release should be regarded as one of, if not the, most significant hazard associated with drilling operations and other intrusive work conducted at sites where possible reactive and/or toxic waste may be encountered. Accordingly, all sources of ignition must be fully controlled. Failure to control ignition sources could result in fire, explosion and pose a serious threat to life and health. Fire extinguishers will be located near each intrusive activity.

4.20.4 Noise

Noise exposure can be affected by many factors including the number and types of noise sources (continuous vs. intermittent or impact), and the proximity to noise intensifying structures such as walls or building which cause noise to bounce back or echo. The single most important factor affecting total noise exposure is distance from the source. The closer one is to the source the louder the noise. The operation of a drill rig, backhoe or other mechanical equipment can be sources of significant noise exposure. In order to reduce the exposure to this noise, personnel working in areas of excessive noise must use hearing protectors (ear plugs or ear muffs) in accordance with the GZA Hearing Conservation Program contained in the Health and Safety Program Manual. GZA will maintain a copy of this program manual on-site. If hearing protection is worn, hand signals will be implemented as needed.

4.20.5 Heat and Cold Stress

Overexposure to temperature extremes can represent significant risks to personnel if simple precautions are not observed. Typical control measures designed to prevent heat stress include dressing properly, drinking plenty of the right fluids, and establishing an appropriate work/break regimen. Typical control measures designed to prevent cold stress

include dressing properly, and establishing an appropriate work/break regimen. The project manager must assure that the appropriate provisions of GZA's Heat and Cold Stress Control Program contained in the Health & Safety Program Manual are observed. GZA will maintain a copy of this program manual on-site.

4.20.6 Electrical

OSHA regulations require that employees who may be exposed to electrical equipment be trained to recognize the associated hazards and the appropriate control methods. All extension cords used for portable tools or other equipment must be designed for hard or extra usage and be (three wire) grounded. All 120 volt, single-phase 15 and 20 ampere receptacle outlets on construction sites and other locations where moisture/water contact may occur must be equipped with ground-fault circuit interrupters (GFCI) units. GFCI units must be activated directly to or as close as possible to the receptacle. GFCI units located away from the receptacle will not protect any wiring between the receptacle and the GFCI unit. Only the wiring plugged into the GFCI unit and outward will be protected by the GFCI. All (temporary lighting) lamps for general illumination must be protected from accidental breakage. Metal case sockets must be grounded. Portable lighting in wet or conductive locations should be 12 volt or less. GZA does not anticipate the need for temporary lighting for this project. GZA assumes that all the work will be completed during the daylight hours.

4.20.7 Moving Vehicles, Traffic Safety

All vehicular traffic routes which could impact worker safety must be identified and communicated. Whenever necessary, barriers or other methods must be established to prevent injury from moving vehicles. This is particularly important when field activities are conducted in parking lots, driveways, ramps or roadways. OSHA 1926.201 specifies that when signs, signals or barricades do not provide adequate protection from highway or street traffic, flagmen must be utilized. Flagmen must wear red or orange garments. Garments worn at night must be reflective.

The uncontrolled presence of pedestrians on a drilling or excavation site can be hazardous to both pedestrians and site workers. Prior to the initiation of site activities, the site should be surveyed to determine if, when and where pedestrians may gain access. This includes walkways, parking lots, gates and doorways. Barriers or caution tape should be used to exclude all pedestrians. Exclusion of pedestrian traffic is intended to prevent injury to the pedestrian and eliminate distractions which could cause injury to GZA personnel or other site workers.

4.20.8 Overhead Utilities and Hazards

Overhead hazards can include low hanging structures which can cause injury due to bumping into them. Other overhead hazards include falling objects, suspended loads, swinging loads and rotating equipment. Hard-hats must be worn by personnel in areas were

these types of physical hazards may be encountered. Barriers or other methods must also be used to exclude personnel from these areas were appropriate. Electrical wires are another significant overhead hazard. According to OSHA (29 CFR 1926.550), the minimum clearance which must be maintained from overhead electrical wires is 10 feet from an electrical source rated $\leq$ 50 kV. Sources rated > 50 kV require a minimum clearance of 10 feet plus 0.4 inches per kV above 50 kV.

4.20.9 Underground Utilities and Hazards

The identification of underground storage tanks, pipes, utilities and other underground hazards is critically important prior to all drilling, excavating and other intrusive activities. In accordance with OSHA 29 CFR 1926.650, the estimated location of utility installations, such as sewer, telephone, electric, water lines and other underground installations that may reasonably be expected to be encountered during excavation work, must be determined prior to opening an excavation. The same requirements apply to drilling operations. Where public utilities may exist, the utility agencies or operators must be contacted directly or through utility clearing services and the appropriate agencies. Where other underground hazards may exist, reasonable attempts must be made to identify their locations as well. Failure to identify underground hazards can lead to fire, explosion, flooding, electrocution or other life threatening accidents.

4.20.10 Confined Space

Confined space entry activities, such as entering sewer systems requires specialized procedures beyond the scope of this plan. Therefore, if circumstances require such activities, this plan must be modified accordingly.

4.30 BIOLOGICAL HAZARDS

All personnel on site should be provided with the information and training necessary to avoid accidental injury or illness which can result from exposure to biological hazards. This includes assuring that the site is carefully assessed so that the hazards associated with poisonous plants, insects or other sources of biological contamination (i.e., septic systems) are recognized and eliminated or controlled. In most cases this can be done by using proper PPE. Biological waste is typically contained/disposed of in red bags. If red bags or other potential biological waste (i.e. syringes) are encounter during site work the work task should be stopped and a trained person contacted to evaluate the potential presence of biological waste.

## 5.00 AIR MONITORING

Air Monitoring falls into three separate categories; real time monitoring, community air monitoring and personal exposure monitoring. Real time monitoring will be conducted

within the exclusion zone (EZ). Community air monitoring will be done at the down wind perimeter of the EZ. Table 2 summarizes the type of environmental monitoring as well as appropriate response actions applicable to the site. Additional details regarding air monitoring are presented below.

## 5.10 REAL TIME MONITORING

The real time monitoring required to determine the airborne concentrations of the representative compounds and the corresponding response action for the site, will be conducted using the instruments indicated in Table 2. Although the data provided by these instruments can be used to determine the appropriate control actions and personal protective equipment requirements, the data may be inappropriate for use in determining employee time weighted average exposures as required by OSHA.

Monitoring with the specified instruments will be conducted at a frequency necessary to adequately characterize airborne contamination levels for each area and each representative task in each area of the site. Initial monitoring will be most frequent and will be either continuous or at intervals of once every 15 minutes as directed by the Site Safety Officer (SSO). Monitoring shall be conducted in close proximity to the source material (auger spoil, excavated soil, etc.) during all intrusive activities described in this HASP; if instruments indicate the presence of target compounds in source area, the general breathing zone in the EZ should then be monitored to determine appropriate response action in accordance with the action levels specified in this section.

Equipment calibration must be performed in accordance with the manufacturers instructions. Field checks using the appropriate reference standards must be made on site at the minimum frequency of twice per shift (pre- and post-sampling). A daily log of all instrument readings, as well as all field reference checks and calibration information, and corrective actions must be maintained.

### 5.10.1 Total Volatiles Organics

A photoionization detector (PID), equipped with a 10.2 ev lamp calibrated to a standard referenced to benzene in air, will be used to monitor the breathing zone of workers performing investigative activities to assess the potential presence of organic vapors. Additionally, vinyl chloride will be monitored for if the total VOCs readings exceed 1 ppm above background. The level of protection may be upgraded and new action levels established by the SSO after the compound causing elevated organic vapor readings is determined using detector tubes.

### 5.10.2 Combustible Gas Indicator

Monitoring using a CGI, calibrated using pentane as a reference standard, is required. If combustible gas levels equal 10 % or greater of the LEL, operation should be shut down and the area evacuated until appropriate control measures have been established

and verified safe for reentry. Steps necessary to minimize fire and explosion must be observed.

5.10.3 Dust Monitoring

GZA will monitor for dust based on visual observations. If dust clouds are observed GZA will request that dust control be used (i.e., wet down the material).

## 5.20 COMMUNITY AIR MONITORING

Real-time air monitoring, for volatile compound levels at the perimeter of the work area will be conducted as follows. Volatile organic compounds shall be monitored at the downwind perimeter of the work area at a minimum of once per hour. 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. All readings shall be recorded and will be available for State (DEC & DOH) personnel to review.

5.20.1 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. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater the 5 ppm over background but less then 25 ppm over background at the perimeter of the work area, activities can resume provided that the organic vapor level 200 ft. 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.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented.

5.20.2 Major Vapor Emissions

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 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, following the cessation of the work activities, or as a the result of an emergency, organic levels persist 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). The Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm.

If efforts to abate the emission source are unsuccessful and levels above 5 ppm, but less than 10 ppm above background, persist for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall immediately be placed into effect (See Section 5.20.3).

5.20.3 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 will go into effect (See Section 11.2).

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.

5.30 PERSONAL EXPOSURE MONITORING

According to OSHA 1910.120 personal exposure monitoring for the purpose of determining individual time-weighted average exposures is required only during site cleanup or other remedial activities. This project does not involve site remediation or cleanup. Therefore, determinations regarding individual exposure potentials will be based on the work area monitoring described above. Separate personal air sampling will not be conducted.

## 6.00 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE will be donned as described below for the activities covered by this HASP. Non-intrusive activities within the scope of this HASP will require Level D protection. All intrusive activities will be initiated in Level D with the potential for upgrade based on air monitoring and site conditions. Work at Level B protection is outside the scope of this HASP.

6.10 NON-INTRUSIVE ACTIVITIES

Non-intrusive activities, which include the topographic survey, will require Level D protective equipment. This equipment is defined as:

- Hard hat;
- Chemically resistant rubber over boots (as required by the SSO) and steel-toed work

boots;

- Work clothes;
- Hearing protection (if necessary ); and,
- Eye protection - contact lenses may not be worn on site.

## 6.20 INTRUSIVE ACTIVITIES

Intrusive activities, which includes existing well assessment, auger probes, Geoprobes, piezometer installation, groundwater sampling, surface water sampling, surface water sediment sampling, will require Level D protective equipment. This equipment is defined as:

- Hard hat;
- Tyvek coveralls (as required by SSO);
- Chemically resistant rubber outer boots(as required by the SSO), steel-toed boots;
- Nitrile gloves (with disposable vinyl inner gloves);
- Eye protection (if full-face respiratory protection is not worn); and,
- Hearing Protection (see Section 4.20.4).

If required (based on air monitoring results or visual observation), Level C respiratory protection will be worn, consisting of MSA brand or equivalent full-face air purifying respirator with combination dust and organic vapor cartridges. Furthermore, should dusty conditions prevail during work activities, Level C respiratory protection will be donned.

All personnel who will be required to don air purifying respirators must have been qualitatively or quantitatively fit-tested for particular brand and size respirator he/she will be wearing on site within the last year.

Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the face seal. For workers requiring corrective face piece lenses, special spectacles designed for use with respirators must be available. Contact lenses may not be worn on site.

# 7.00 SITE CONTROL

To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, work areas along with personal protective equipment

requirements will be clearly identified.

GZA designates work areas or zones as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November, 1985. They recommend the area surrounding each of the work areas to be divided into three zones; the exclusion or "Hot" zone, contamination reduction zone (CRZ), and the support zone.

## 7.10 EXCLUSION ZONE

Due to the scattered locations of the activities covered within the scope of this HASP, the actual zones are expected to change frequently in accordance with daily activities. Therefore, all exclusion zones (EZ) are expected to be temporary or dynamic. Site personnel will be advised of the locations of temporary work zones as part of the routine site safety meetings described in Section 9.00.

Each EZ will consist of the active work areas where site investigations are taking place. A 15-foot radius will be established as the typical perimeter of the zone, however, this may be increased as necessary in order to protect personnel from contact with vapors that may arise from these operations. The perimeter of the zone will be marked with brightly colored hazard tape. All personnel entering these areas must wear the prescribed level of protective equipment.

## 7.20 CONTAMINATION REDUCTION ZONE

Each contamination reduction zone (CRZ) will be a clearly marked corridor between the exclusion and support zones. The actual length and/or location of the corridor will also be temporary or dynamic in accordance with the locations of the exclusion zones. The CRZ is where personnel will begin the sequential decontamination process when exiting the EZ. To prevent cross contamination and for accountability purposes, all personnel must enter and leave the exclusion zone through the CRZ. A separate heavy equipment decontamination zone must be established at the site.

## 7.30 SUPPORT ZONE

The support zone (SZ) will coincide with the project command post, and will consist of an area outside the exclusion zone and CRZ where support equipment will be staged. Eating, drinking and smoking will be allowed only in this area. Sanitary facilities will be located within the SZ. In addition, potable water and water and soap for hand washing will be available at the site, along with containers for solid waste for use by GZA, TAMS and TAMS subcontractor personnel. The containers will be removed from the site by GZA for proper disposal. Hazardous, or potentially hazardous, materials will be drummed, labeled and stored with other drums of substances generated during this project for future disposal as required by the project specific work plan.

## 7.40 OTHER SITE CONTROL AND SAFETY MEASURES

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

The "buddy system" will be used at all times by all field personnel. No one is to perform field work alone. The standby team member must be intimately familiar with the procedures for initiating an emergency response.

Avoidance of contamination is of the utmost importance. Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces or materials. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or set equipment on the ground. Protect air monitoring equipment from water by bagging.

Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.

Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited except in the support zone after proper decontamination.

Beards or other facial hair that interfere with respirator fit are prohibited for anyone who is required to wear a respirator.

The use of alcohol or drugs is prohibited during the conduct of field operations.

All equipment must be decontaminated or properly discarded, as designated by the SSO, before leaving the site.

Safety equipment (PPE) described in Section 6.0 will be required for all field personnel unless otherwise approved by the local/regional health and safety representative or the SSO.

## 7.50 SITE SECURITY

The GZA Site Manager is responsible for identifying the presence of all GZA/TAMS and TAMS subcontractor employees on site. A sign-in/sign-out log will be maintained for this purpose.

Equipment left on site during off hours must be locked, immobilized and/or otherwise secured to prevent theft or unauthorized use or access.

## 8.00 DECONTAMINATION

To the extent possible, the sampling methods and equipment have been selected to minimize both the need for decontamination and the volume of waste material to be generated. Decontamination procedures specific to each of the field activities are described in the QAPjP. Used personal protective equipment will be disposed as a solid waste.

### 8.10 PERSONNEL DECONTAMINATION

Personnel decontamination will be accomplished by following a systematic procedure of cleaning and removal personal protective clothing (PPE). Contaminated PPE such as boots and face shields will be rinsed free of gross contamination, scrubbed clean in a detergent solution and then rinsed clean. To facilitate this, a three-basin wash system will be set up on site. The wastewater will be transferred to drums, which will be labeled and left on site for disposal as required by the project specific work plan.

Respirators will be cleaned after each use with respirator wipe pads and will be stored in plastic bags after cleaning. Alternative chemical decontamination procedures, such as steam-cleaning or pressure washing field boots, may be used if available.

#### 8.10.1 Decontamination Sequence

Steps required will depend on the level of protection worn in accordance with Section 6.00:

1. Remove and wipe clean hard hat.
2a. Rinse boots and gloves of gross contamination.
2b. Scrub boots and gloves clean.
2c. Rinse boots and gloves.
3. Remove outer protective boots .
4. Remove outer gloves.
5. Remove tyvek coveralls.
6. Remove respirator, wipe clean and store.
7. Remove inner gloves.

Boots that have been decontaminated can be worn into the support zone.

### 8.20 EQUIPMENT DECONTAMINATION

To the extent possible, measures should be taken to prevent contamination of sampling and

monitoring equipment. Sampling devices become contaminated, but monitoring instruments, unless they are splashed, usually do not. Once contaminated, instruments are difficult to clean without damaging them. Any delicate instrument which cannot be easily decontaminated should be protected while it is being used. It should be placed in a clear plastic bag, and the bag taped and secured around the instrument. Openings are made in the bag for sample intake and exhaust.

Wooden tools are difficult to decontaminate because they absorb chemicals. They should be kept on site and handled only by protected workers. At the end of the field activities, wooden tools should be discarded.

Geoprobe drilling rigs and other heavy equipment are difficult to decontaminate. The method generally used is to wash them with water under high pressure or to scrub accessible parts with detergent/water solution under pressure. A decontamination pad will be constructed on-site by the drillers for equipment decontamination.
In some cases, shovels, scoops and augers may require steam cleaning. Particular care must be given to those components in direct contact with contaminants. Personnel doing the decontamination must be adequately protected for the methods used since these can generate contaminated mists and aerosols.

## 9.00 MEDICAL MONITORING AND TRAINING REQUIREMENTS

### 9.10 MEDICAL

All personnel covered by this HASP must be active participants in GZA's Medical Monitoring Program or in a similar program which complies with 29 CFR 1910.120(f). Each individual must have completed an annual or two years (if approved by a Medical director) surveillance examination and/or an initial baseline examination within the last year prior to performing any work on this site covered by this HASP. Documentation of the examination must include a physicians statement indicating the employee is fit and capable of performing their duties.

GZA's medical monitoring program is administered by GZA's Director of Corporate Health and Safety in association with Environmental & Occupational Specialists, Warwick, RI.

### 9.20 TRAINING

All personnel covered by this HASP must have completed the appropriate training requirements specified in 29 CFR 1910.120 Hazard Communication and 29 CFR 1910.120(e). Each individual must have completed an annual 8-hour refresher training course and/or initial 40-hour training course within the last year prior to performing any work on this site covered by this HASP. Also, at least one GZA employee must be on site during all GZA activities to act as the site manager and SSO. This individual must have

documentation of completion of the specified 8-hour training course for managers and supervisors.

### 9.30 SUBCONTRACTORS

Subcontractors to GZA/TAMS will be required to provide to the GZA/TAMS Project (Site) Manager specific written documentation that each individual assigned to this project has completed the medical monitoring and training requirements specified above. This information must be provided prior to their performing any work on site.

### 9.40 SITE SAFETY MEETINGS

Prior to the commencement of on-site investigative activities, a site safety meeting will be held to review the specific requirements of this HASP. Sign-off sheets will be collected at this meeting. Short safety refresher meetings will be conducted by the SSO weekly (at a minimum) or as needed throughout the duration of field activities. In addition, the SSO will ensure that site visitors have had the required training in accordance with 29 CFR 1910.120 and will provide pre-entry safety briefings.

## 10.00 HEALTH AND SAFETY AUDIT

The activities described in this HASP may be subject to audit by a representative of the GZA's or TAMS Corporate Health and Safety Department. The appropriate schedule for any such audit will be determined at a later date.

In addition to the possible need for a formal audit, daily safety and health inspections shall be conducted by the SSO to determine if operations are being performed in accordance with the HASP, applicable OSHA regulations and contract requirements.

## 11.00 EMERGENCY ACTION PLAN

### 11.10 GENERAL REQUIREMENTS

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result in an uncontrolled release of a hazardous substance." GZA personnel covered by this HASP may not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion, or chemical exposure). GZA response actions will be limited to evacuation and medical/first aid as described within this section below. Written directions to the hospital are found on Figure 2.

The basic elements of an emergency evacuation plan include employee training, alarm systems, escape routes, escape procedures, critical operations or equipment, rescue and medical duty assignments, designation of responsible parties, emergency reporting procedures, and methods to account for all employees after evacuation.

11.10.1 Employee Information

General training regarding emergency evacuation procedures are included in the GZA initial and refresher training courses as described above in Section 9.20 of this HASP. Also as described above in Section 9.40, employees must be instructed in the specific aspects of emergency evacuation applicable to the site as part of the site safety meeting prior to the commencement of all on-site activities. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

11.10.2 Emergency Signal and Alarm Systems

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices can not be clearly perceived above ambient noise levels (i.e., noise from heavy equipment, drilling rigs, etc.) and anytime a clear line-of-sight can not be easily maintained amongst all GZA personnel because of distance, terrain or other obstructions.

When verbal communications must be supplemented, emergency signals (using hand-held portable airhorns) must be implemented in accordance with GZA's Emergency Response and Site Evacuation procedures contained in the Health and Safety Program Manual. GZA will maintain a copy of this program manual on-site.

## 11.20 EMERGENCY CONTACTS

Prior to the initiation of site activities, the SSO must contact the (appropriate) Fire Department and ambulance service to inform them of GZA's intent to solicit their services in the event of an emergency on site. In the event of an emergency, assistance may be requested using the following telephone numbers:

| | |
|---|---|
| Police | 911 |
| Fire | 911 |
| Ambulance | 911 |
| Hospital | (516) 674-7300 |

Hospital Location (North Shore University Hospital at Glen Cove)

The hospital is located at 101 St. Andrews Lane, Glen Clove, New York. See Figure 2 (Map of Route to Hospital).

| | |
|---|---|
| TAMS Consultants | (973)338-6680 |
| GZA GeoEnvironmental (Buffalo) | (716)685-2300 |
| GZA GeoEnvironmental (New Jersey) | (973) 256-7800 |
| Geoprobe Contractor | _____ |

11.30 INCIDENT REPORTING PROCEDURES

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an accident investigation and report. The investigation should be initiated as soon as emergency conditions are under control. The purpose of this investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided. A copy of GZA's Incident Investigation Form is included in Appendix A.

The investigation should begin while details are still fresh in the mind of anyone involved. The person administering first aid may be able to start the fact gathering process if the injured are able to speak. Pertinent facts must be determined. Questions beginning with who, what, when, where, and how are usually most effective to discover ways to improve job performance in terms of efficiency and quality of work, as well as safety and health concerns.

# TABLES

**TABLE 1**
**PALL CORPORATION SITE**
**SUMMARY OF HISTORIC VOC GROUNDWATER DATA**
FRI FIELD ACTIVITY PLAN

| Compounds | Pall Corporation Wells | | | | | | | | | | | | | | | | | | Associated Drapery Wells | | August Thomsen Wells | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-1P | | | MW-2P | | | MW-3P | | | MW-4P | | | MW-5P | | | MW-6P | | MW-7P | MW-1H | MW-2H | MW-1a | MW-2a |
| Date | Feb-92 [a] | Oct-95 [b] | Nov-96 [b] | Feb-92 [a] | Oct-95 [b] | Nov-96 [b] | Feb-92 [a] | Oct-95 [b] | Nov-96 [b] | Feb-92 [a] | Oct-95 [b] | Nov-96 [b] | Feb-92 [a] | Oct-95 [b] | Nov-96 [b] | Oct-95 [b] | Nov-96 [b] | Nov-96 [b] | Oct-93 [a] | Oct-93 [a] | Feb-92 [a] | Feb-92 [a] |
| Vinyl Chloride | 7 j | | | 130 | | 2 j | 120 | | 7 j | 110 | | 94 | 840 | | 73 | | 4 j | | | | 130 | 180 |
| Chlorobenzene | | | | | | | | | | | | | | | | | | | | | | 12 |
| Chloroethane | | | | | | | | | 3 j | | | | 2 j | | | | | | 1 | | | |
| Chloroform | | | | | | | | | | | | | | | | | | | | | | 28 |
| Methylene Chloride | | | | | | | 3 j | | 3 j | | | | | | | | | | 6 Bj | 4 | 2 | 2 |
| Acetone | | | 26 | | | | | | 71 | | | 52 | | | 11 | | | | 44 | 17 | | |
| 2-Butanone | | | 2 j | | | | | | | | | | | | | | | | | | | |
| 1,1-Dichloroethene | 2 j | | 26 | 22 | | | 6 | | | | | | 7 | | 1 j | 9.2 B | 5 j | | | | 9 | 3 j |
| 1,1-Dichloroethane | 11 | | | 33 | | | 13 | | 8 j | 8 | | 7 j | 10 | | 5 j | 8.9 | 8 j | | | 1 | 15 | 6 |
| 1,2-Dichloroethene (total) | 25 | 8.6 B | | 2500 | 8.2 B | 39 | 480 | | 8 j | 140 | | 230 | 3500 | 220 B | 510 | 47 B | 30 | 1 j | Note 4 | | 480 | 620 |
| 1,1,1-Trichloroethane | 1 j | | | 4 j | | | | | | | | | | | | 47 | 23 | | | | 16 | 3 |
| 1,2-Dichloroethane | | | | | | | | | | | | | | | | | 1 j | | | 14 | | |
| Trichloroethene | 12 | | | 480 | 7.1 | 62 | 65 | | | 19 | | 3 j | 1600 | | 11 | 18 | 12 | | | 4 j | 380 | 65 |
| 1,1,2-Trichloroethane | | | | | | | 4 j | | | | | | | | | | | | | | | |
| Benzene | | | | 2 j | | | | | | 1 j | | 2 j | | | | | | | | | 2 | 8 |
| Perchloroethylene | | | | 85 | 420 | 280 | 24 | | | 18 | | 7 j | 880 | | 3 j | 9.8 | 7 j | | | | 410 | 160 |
| Ethylbenzene | | | | | | | | | | | | | | | | | | | | | | 13 |
| Styrene | | | | | | | | | | | | | | | | | | | | | | 10 |
| Toluene | | | | | | | 5 | | 1 j | 2 j | | 3 j | 3 j | | | | | | | | | 12 |
| Xylenes | | | | 3 j | | | 22 | | | 4 j | | 2 j | 5 j | | | | | | | | | 39 |

Notes:
1) Concentration in parts per billion (ppb).
2) "j" indicates concentration is estimated.
3) "B" indicates compound also reported in the blanks.
4) Results presented in H2M report indicate "J" as the concentration. It is not known whether this compound was detected.

a) Data from the report "Source Area Investigation Sea Cliff Industrial Area" Glen Cove, New York; prepared by H2M Group, September, 1992.

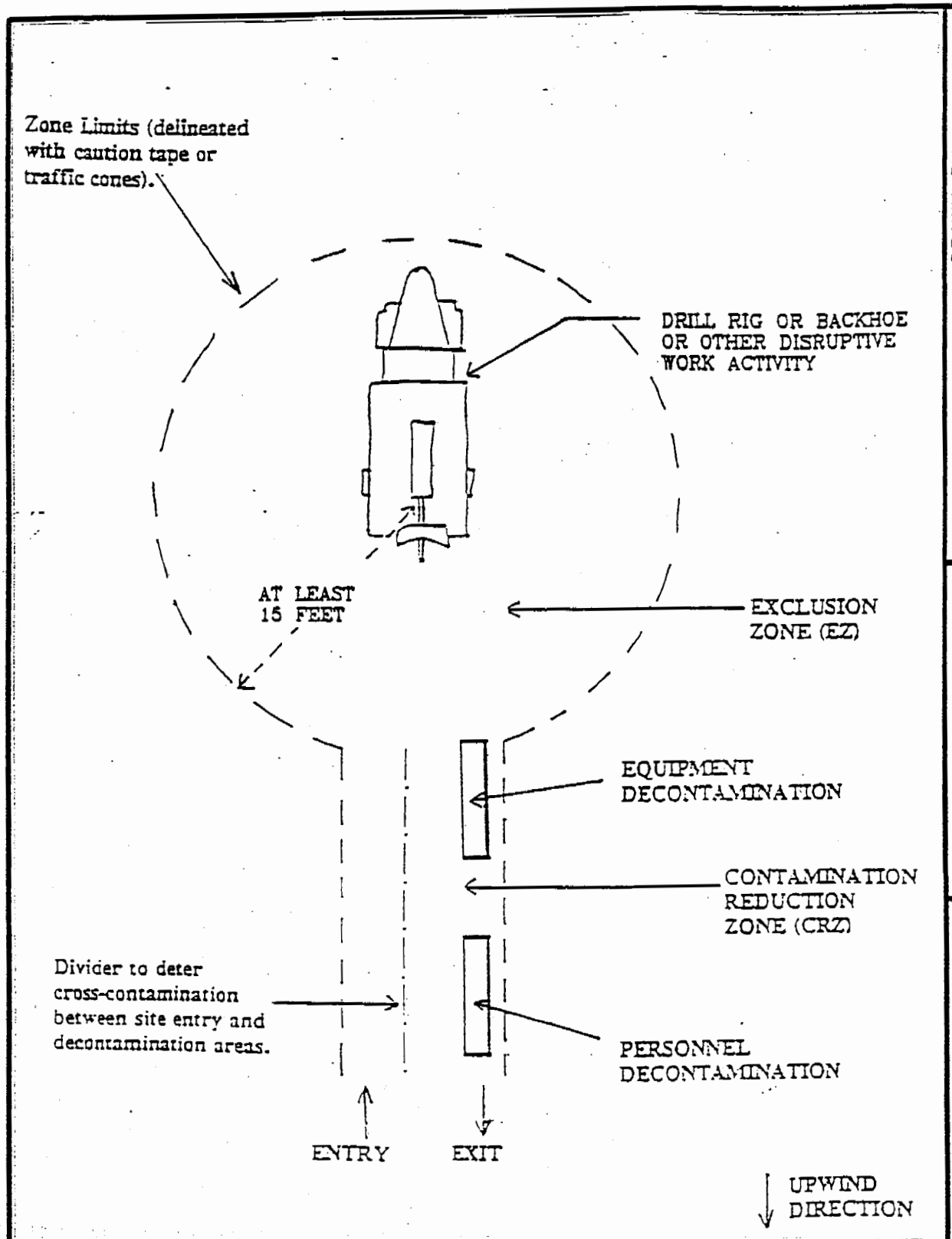
b) Data from the report "Groundwater Sampling and Analysis Report" Pall Corporation 30 Sea Cliff Avenue, Glen Cove, New York, December, 1996. Report prepared by Fluor Daniel GTI.

TABLE 2
**ACTION LEVELS**
Pall Corporation Site

| | Monitoring Type | Concentration | Instrument | Monitoring Location | Monitoring Frequency | Required Action |
|---|---|---|---|---|---|---|
| | | | | | | |
| Real time Monitoring | Total VOCs | < 1 ppm | PID (10.2 ev) | EZ | at least every 15 minutes | continue monitoring |
| Real time Monitoring | Total VOCs | > 1 ppm | PID (10.2 ev) | EZ | continuous | Test for specific compounds with detector tubes (vinyl chloride). Set new action level after consulting with SSO. |
| Community Air Monitoring (intrusive activities only) | Total VOCs | < 5 ppm above background | PID (10.2 ev) | down wind of EZ | at least every 1 hour | Continue monitoring of EZ (potential source) and down wind perimeter of the EZ (work zone). |
| Community Air Monitoring (intrusive activities only) | Total VOCs | > 5 ppm above background | PID (10.2 ev) | down wind of EZ | continuous | Stop work. If organic vapors levels are >5ppm over background but less than 25 ppm over background at the perimeter of the work area than work can resume provided the organic vapor level 200 feet down wind of the work area or half the distance to the nearest structure is < 5ppm. If the level is > 5 ppm 200 feet downwind, follow procedures outlined in section 5.2.2 (Major Vapor Emissions) of this plan. |
| Community Air Monitoring (intrusive activities only) | Total VOCs | > 25 ppm above background | PID (10.2 ev) | down wind of EZ | continuous | Stop work. Follow air monitoring procedures outline in section 5.2.2 (Major Vapor Emissions) of this plan. |
| Real time Monitoring | Combustible Gas | <10% LEL | CGI | EZ | at least every 15 minutes | Eliminate all ignition sources |
| Real time Monitoring | Combustible Gas | >10% LEL | CGI | EZ | continuous | Stop work and contact SSO. Evaluate cause of gas. |
| Visual | Dust | Visible amount | none | EZ/work area | continuous | Stop work and reduce dust by wetting the area or changing operation. |

EZ= Exclusion Zone (work zone).
LEL=Lower explosive limit.
VOCs=Volatile organic compounds.
SSO=Site safety officer.

# FIGURES




DRAWN BY:

DATE: January 1998

GZA GeoEnvironmental of New York

SCALE IN FEET

Not to scale

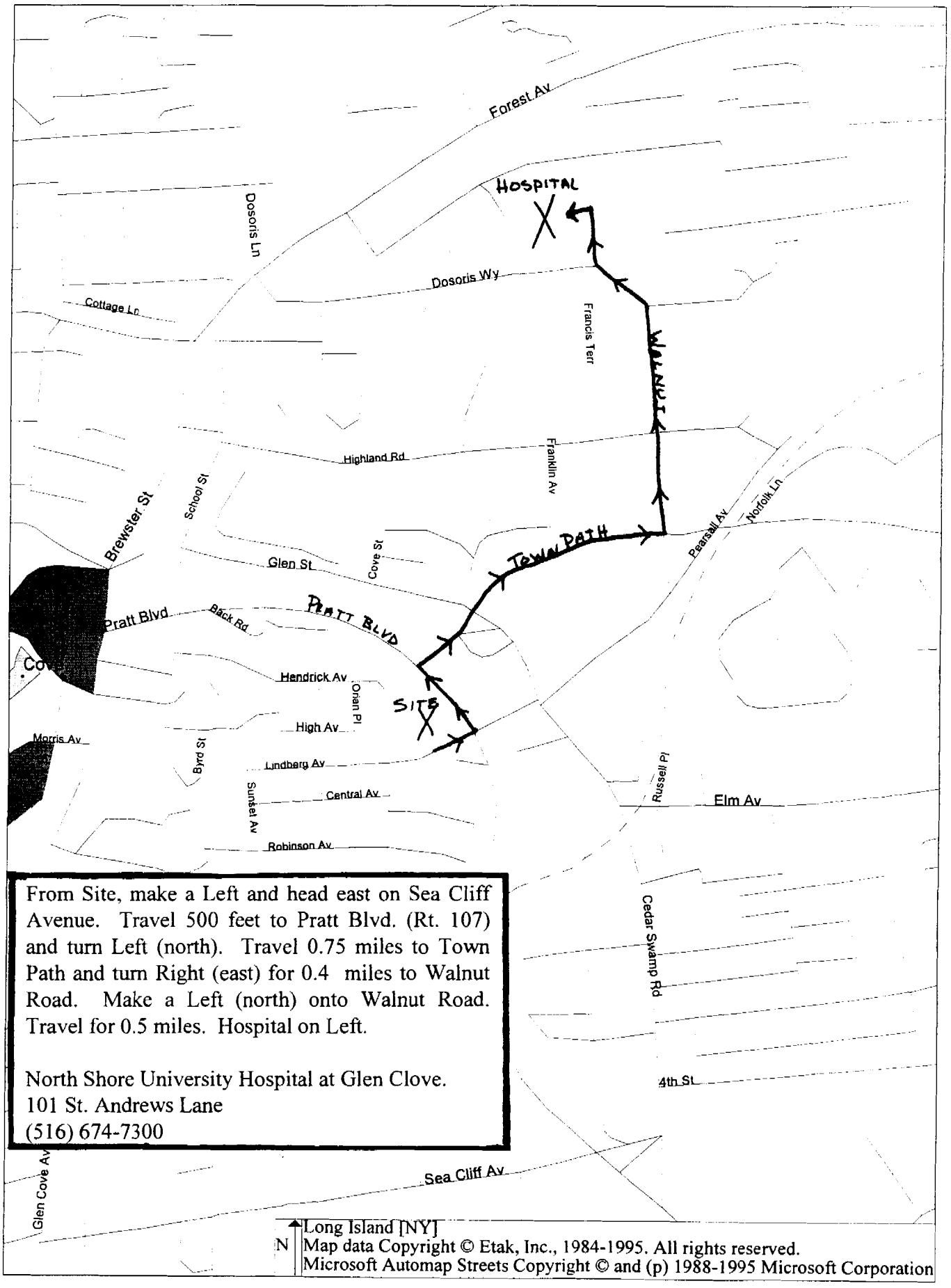
0

PALL CORPORATION
Sea Cliff Avenue, Glen Cove
New York.

Typical Layout of Exclusion Zone and Contamination Reduction Zone

PROJECT No.
55189

FIGURE No.
1




From Site, make a Left and head east on Sea Cliff Avenue. Travel 500 feet to Pratt Blvd. (Rt. 107) and turn Left (north). Travel 0.75 miles to Town Path and turn Right (east) for 0.4 miles to Walnut Road. Make a Left (north) onto Walnut Road. Travel for 0.5 miles. Hospital on Left.

North Shore University Hospital at Glen Clove.
101 St. Andrews Lane
(516) 674-7300

Figure 2

**APPENDIX A**

GZA HEALTH AND SAFETY BRIEFING/SITE ORIENTATION RECORD

SITE SIGN-IN SHEET

GZA INCIDENT INVESTIGATION FORM

## GZA Health and Safety Briefing /Site Orientation Record

Pall Corporation Site

This is to verify that I, the undersigned, have been provided with a site (orientation) briefing regarding the safety and health considerations at Pall Corporation Site. I agree to abide by my employer's site-specific safety and health plan and other safety or health requirements applicable to the site.

| Name (Print) | Signature | Company | Date |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |
| | | | |

Site (orientation) briefing conducted by: _____ Date:_____

**Site Sign In Sheet**

Pall Corporation Site

| Name (Print) | Signature | Company | Date | Time In | Time Out |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

Site (orientation) briefing conducted by: _____ Date:_____

# GZA INCIDENT INVESTIGATION FORM

Employee's Name _____ GZA Company Name _____

Project Name _____ Project Location _____

Project Number _____

Building _____ Room _____ Other _____

Time Incident Occurred _____ Date _____

Supervisor's Name _____

Type of Case:

First Aid _____ Medical Treatment _____

Lost Time _____ Fatality _____ Property Damage _____

Occupational Illness _____

Describe the incident (What happened):

Describe the type of first aid or medical treatment provided:

Describe employee activity at time of incident:

Describe any tools or machinery involved:

Describe any personal protective equipment used by employee:

In your opinion, what the probable causes of the incident are:

In your opinion, how this incident could have been prevented:

Changes in process, procedure, or equipment that you would recommend:

How you would classify the apparent causes of this incident:

Human error _____ Equipment _____

Material _____ Personal Protective Equipment _____

Real Time _____ Other _____

Name and signature of person preparing this form:

_____

Distribution:

Branch/Regional Office Manager:
Regional Health and Safety Coordinator:
Corporate Director of Health and Safety:
Other:

Note: If the space provided on this form is insufficient, provide additional information on separate paper and attach. The completed investigation report must be submitted to the Corporate Director of Health and Safety in Newton within five days.