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GENERAL CONSOLIDATED INDUSTRIES, INC.

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September 1, 2000

New York State
Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Eastern Remedial Action, Room 242
50 Wolf Road
Albany, New York 12233-7010

Attn: Mr. Michael MacCabe Environmental Engineer I

Re: Supplemental Remedial Investigation Work Plan

Precision Concepts 26 Precision Drive Shirley, New York 11967 IHWDS I.D. No. 1-52-158

Dear Mr. MacCabe:

As per your request, enclosed please find two (2) original Supplemental Remedial Investigation Work Plans for the above referenced site.

Should you have any questions, or require additional information, please do not hesitate to contact our office.

Matthew Boeckel

Very truly yours

Senior Hydrogeologist

MB:sh Encs.



SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN

PRECISION CONCEPTS 26 PRECISION DRIVE SHIRLEY, NEW YORK 11967

NYSDEC IHWDS I.D. No. 1-52-158

Prepared For:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION 50 WOLF ROAD ALBANY, NEW YORK 12233-7010

AUGUST 2000

Prepared by:

Kempey Engineering 4 Brunswick Drive East Northport, New York 11731 516-368-3324

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1.0 <u>INTRODUCTION</u>

1.1 Overview

This Remedial Investigation Work Plan has been prepared by Kempey Engineering and General Consolidated Industries, Inc. (GCI), for the property located at 26 Precision Drive, Shirley, New York, identified on the tax map as Section 584, Block 1, Lot 4.034. The subject property is depicted on a U.S.G.S. 7.5 minute topographical map, please refer to Figure 1 - Site Location Map.

The subject site is located at 26 Precision Drive, which is approximately 1,343 feet east of William Floyd Parkway, Town of Brookhaven, Suffolk County, Long Island, New York. The subject property is located in a moderately developed commercial neighborhood. The site is bordered on the north by the Long Island Expressway, to the south and west of the site are commercial buildings and to the east is vacant undeveloped land. Brookhaven National Laboratory (BNL), which has been documented as a source of groundwater contamination, is located less than one-eighth (1/8) of a mile to the north (upgradient) of the subject property.

The Remedial Investigation Work Plan was developed in order to characterize the nature of the groundwater in the vicinity of the subject property, as well as to supplement the data obtained from the Remedial Investigation activities which were conducted at the subject site on June 1-3, 7 & 10, 1999.

1.2 Work Plan Approach

The objectives of this Remedial Investigation Work Plan were to develop a groundwater sampling regimen that would accurately characterize the groundwater quality in the vicinity of the subject property. The method of sampling as proposed in the Remedial Investigation Work Plan will provide detailed groundwater quality data. The data will be interpolated in order to determine if there is an on-site source of contamination or whether there is contamination migrating from BNL across the subject property.

This work plan presents Kempey Engineering and GCI's proposed technical scope of work for the Remedial Investigation to be conducted at the subject property.

2.0 WORK PLAN RATIONALE

2.1 <u>Data Quality Objectives</u>

The Data Quality Objectives (DQOs) for the Remedial Investigation Work Plan will be applicable to all data-gathering activities at the site. DQOs will be incorporated into sampling, analysis, and quality assurance tasks associated with the work plan.

The primary data users for this project will be Kempey Engineering and GCI, Inc. The secondary data user will be Mr. Mike Veraldi, the Quality Assurance Officer (QAO) for the project. Mr. Veraldi will be responsible for reviewing all laboratory data packages to ensure that all laboratory protocol have been complied with and that the results are genuine. There are no other data users anticipated at this time.

Data to be collected during the Remedial Investigation is intended to characterize the nature and extent of groundwater contamination at the subject site. The data will allow for the evaluation and possible implementation of potential remedial alternatives or interim remedial measures (IRM).

For this project, no field screening will be performed during any groundwater sampling. The samples will be visually inspected for the presence of possible evidence of contamination. Representative groundwater samples will be submitted to Chemtech Consulting Group. Chemtech Consulting Group is a New York State Department of Health (NYS DOH) Environmental Laboratory Approval Program (ELAP) and US EPA Contract Laboratory Protocol (CLP) certified laboratory, which is located in Englewood, New Jersey. The ELAP CLP certification number for the laboratory is 10624. The analytical data for all of the samples will be reported in a NYS DEC Analytical Services Protocol (ASP) Category B deliverables package.

The data uses will be for site characterization, possible risk assessment, evaluation of remedial alternatives or interim remedial measures (IRM), and engineering design.

2.2 Work Plan Approach

The Work Plan Approach is to evaluate site data. The existing information will be incorporated into the tasks necessary for the completion of additional data gathering necessary to evaluate potential remedial alternatives for the site. Data previously collected will be supplemented by additional sampling and analysis. Based on the findings of the investigation, remedial alternatives and IRMs may be evaluated and the most feasible alternative(s) will be identified. IRMs are intended to remediate materials which may be a source of contamination.

2.3 Applicable or Relevant and Appropriate Requirements

The following applicable or relevant and appropriate requirements for the site have been preliminarily identified:

 The NYS DEC Water Quality Regulations Surface Water and Groundwater Classifications and Standards - Title 6, Chapter X Parts 700-706.

3.0 FIELD SAMPLING PLAN

To address the data needs for the site, Kempey Engineering and GCI, Inc., propose to perform sampling of the groundwater. The proposed sampling locations associated with the Remedial Investigation Work Plan are shown on Figure 2 - Sampling Location Map.

3.1 Groundwater Sampling

A total of three (3) upgradient and eight (8) down-gradient groundwater borings will be installed in strategic locations throughout the subject site in order to address the groundwater quality. The borings will be installed utilizing a Geoprobe® drill rig. Groundwater samples will be collected at the water-table interface level, as well as from twenty (20) feet and forty (40) feet below the water-table in all eleven (11) of the borings.

The groundwater samples will be collected utilizing the Geoprobe® Screen Point 15 sampling system, which is designed to retrieve samples at discrete depths. The groundwater sampling system consists of a screen with a standard slot size of 0.004 inches, which is sealed inside the sheath with Neoprene O-rings which prevent infiltration of formation fluids until the desired depth is attained. Once the screen has been driven to the appropriate sampling depth, a series of extension roods are utilized to hold the screen in-place while the driving rods are retracted. A total of 41.5 inches of screen is left in contact with the surrounding formation. The groundwater samples are then extracted by oscillating the tubing in an up and down manner. Disposable lengths of polyethylene hose will be utilized for each sampling event and then appropriately discarded, so as to eliminate the potential for cross-contamination.

The groundwater samples will be stored in laboratory approved glassware immediately upon extraction. It is estimated that a total of thirty-three (33) groundwater samples will be submitted for laboratory analysis. In addition, a trip blank will be prepared and submitted for laboratory analysis. The samples will be analyzed for TCL Volatiles. The results will be presented in a NYS DEC ASP Category B deliverables package.

3.2 Quality Assurance Project Plan

3.2.1. Sampling Equipment Decontamination Procedures

All non-disposable down-hole equipment (i.e., extension rods, etc.) used during the drilling and sampling will be decontaminated prior to use at each location to prevent cross contamination. The decontamination procedures are as follows:

- 1. Equipment will be scrubbed in a bath of potable water and low-phosphate detergent;
- 2. Potable water rinse;
- 3. A methanol rinse;
- Potable water rinse;
- 5. Air dry.

3.2.2 Chain of Custody Procedures

For each day of sampling, a chain of custody sheet will be completed and submitted to the laboratory. The chain of custody sheet will include the project name, the sampler's signature, the sampling locations, intervals, and analysis parameters requested. The samples will be stored on ice in a cooler. The cooler will be secured using a custody seal to ensure that no tampering has occurred. The laboratory will receive the samples within forty-eight (48) hours of being collected.

3.2.3 QA/QC Samples

QA/QC samples will be obtained during the groundwater sampling. A total of one (1) trip blank will be prepared for shipping with the cooler and groundwater samples. The trip blank results will be reviewed to evaluate the potential for field or laboratory contamination and will attest to the quality of the decontamination procedures.

3.3 <u>Sample Analysis</u>

All groundwater Representative groundwater samples will be submitted to Chemtech Consulting Group. Chemtech Consulting Group is a New York State Department of Health (NYS DOH) Environmental Laboratory Approval Program (ELAP) and US EPA Contract Laboratory Protocol (CLP) certified laboratory, which is located in Englewood, New Jersey. The ELAP CLP certification number for the laboratory is 10624. The analytical data for all of the samples will be reported in a NYS DEC Analytical Services Protocol (ASP) Category B deliverables package.

3.4 Data Evaluation

Data collected during the Remedial Investigation will be assembled, reviewed, and evaluated to assure satisfaction of the work plan objectives. The data will be presented in a NYS DEC ASP Category B deliverables package. The data will be reviewed by Mr. Mike Veraldi, the Quality Assurance Officer (QAO) for the project. Mr. Veraldi will develop a Data Usability Summary Report (DUSR) to ensure thorough evaluation of the analytical data. The DUSR will be generated as per the requirements of the NYSDEC Guidance for the Development of Data Usability Summary Reports.

The primary objective of the DUSR will be to determine if the data meets the specific project requirements. The data collected will be organized and analyzed to identify the nature and extent of contamination, and to further identify potential sources of contaminants.

The groundwater quality data will be evaluated and mapped to illustrate the areal and vertical extent of the contaminants detected. Maps and tables of the data from the previous sampling programs and from the Remedial Investigation will be used to assist in the analysis. The results of the data evaluation will be discussed in the Focused Remedial Investigation report.

3.5 Assessment of Potential Remedial Alternative

After existing and newly-acquired data are evaluated, the potential remedial objectives and alternatives will be developed, if appropriate.

3.6 Remedial Investigation Report

After completion of the field investigation, sample analysis, data evaluation, and assessment of potential remedial alternatives, Kempey Engineering and GCI Inc., will prepare a Remedial Investigation report. The report will contain a summary of results from previous sampling events as well as the data and analyses performed as part of this investigation.

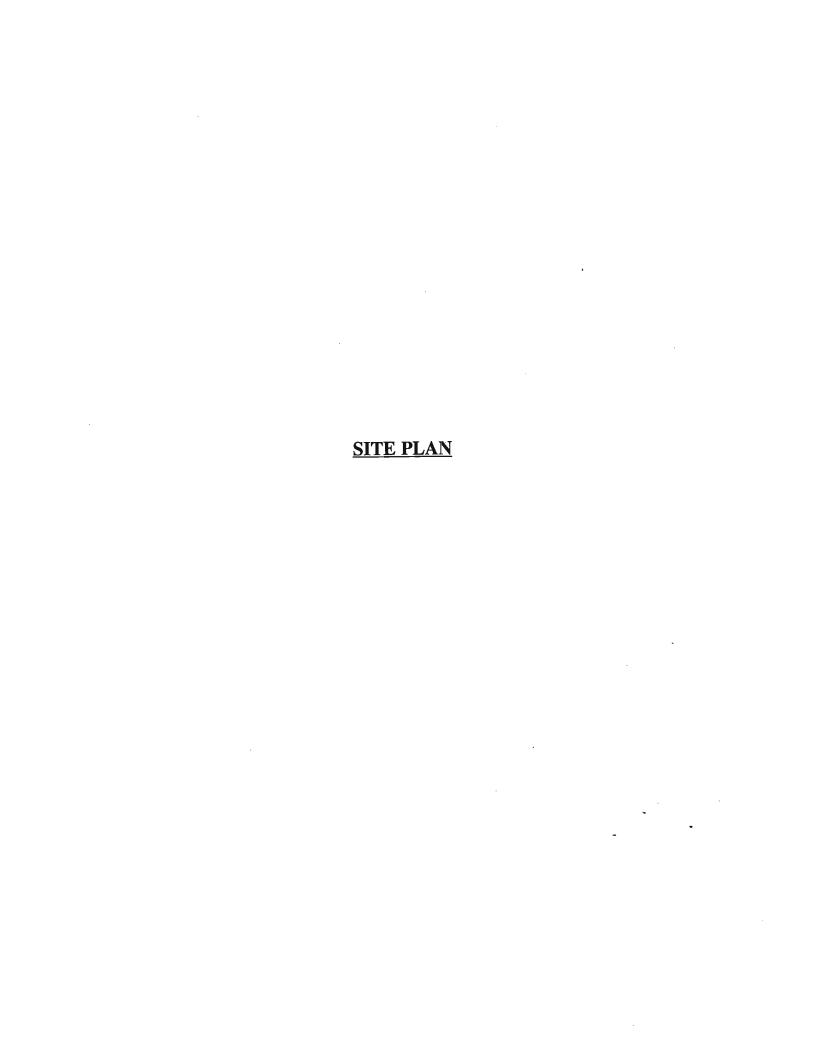
3.7 Estimated Schedule of the Remedial Investigation Activities

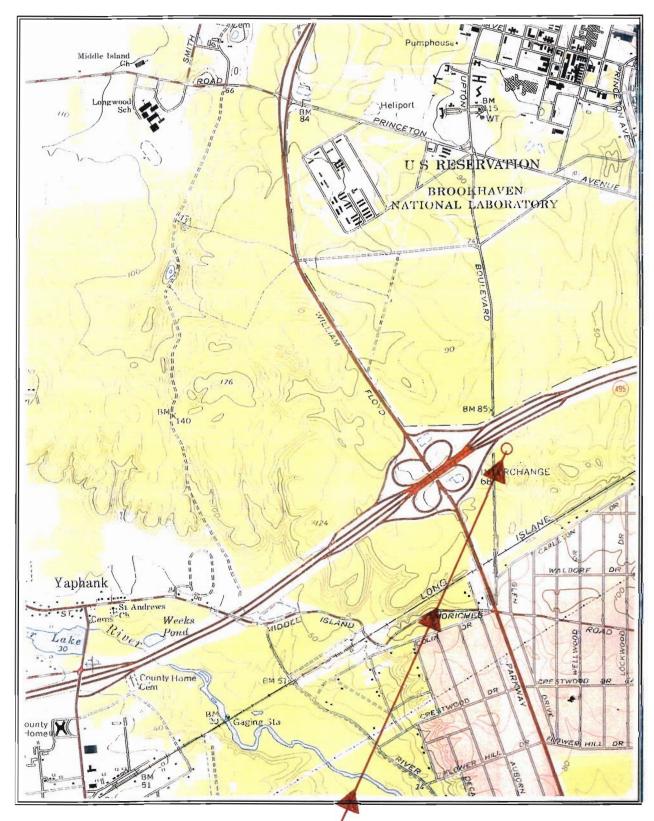
It is estimated that it would require three (3) days to conduct the prescribed groundwater sampling regimen, laboratory analysis would require approximately ten (10) days, data validation would require approximately two (2) weeks, and report preparation would require approximately two (2) weeks. Changes in the proposed scope of work may alter the aforementioned schedule of activities.

3.8 Miscellaneous

The project manager for this project will be Eugene G. Kempey, P.E. The field supervisor will be Matthew Boeckel. The drilling firm will be Impact Environmental Inc. The Quality Assurance Officer (QAO) will be Mike Veraldi.

The laboratory results and method detection limits for each analysis per matrix will be as per NYS DEC ASP Revision '95 requirements.

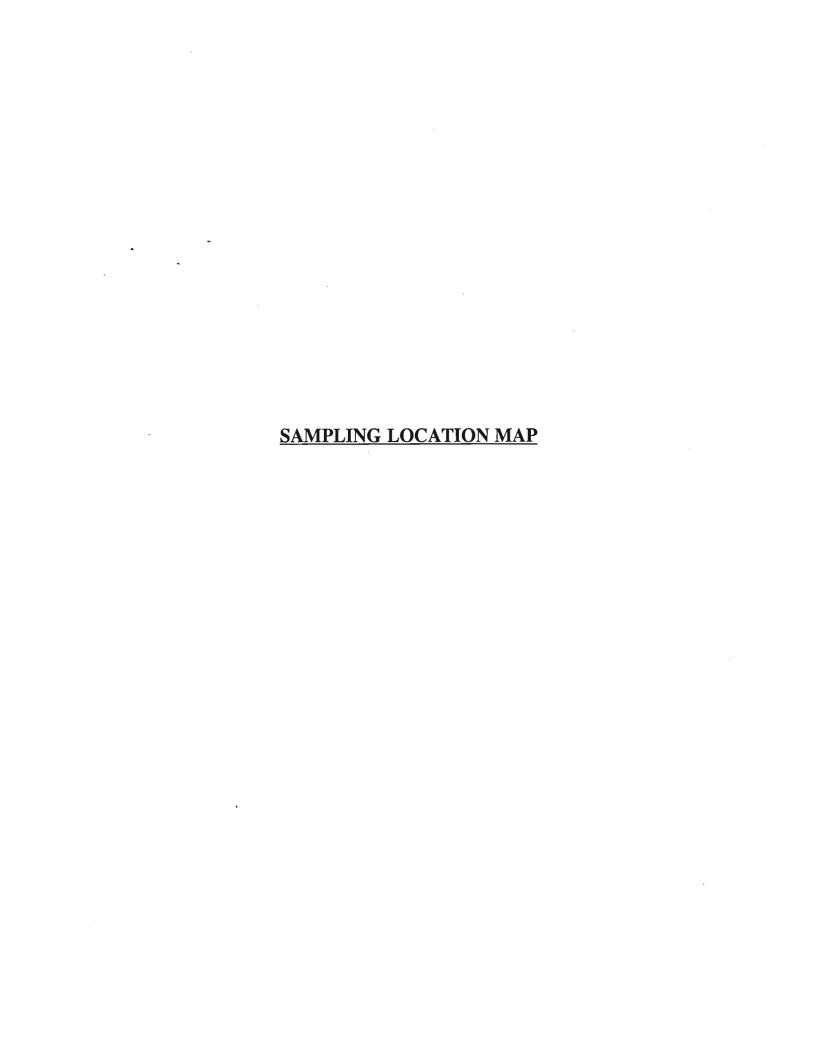


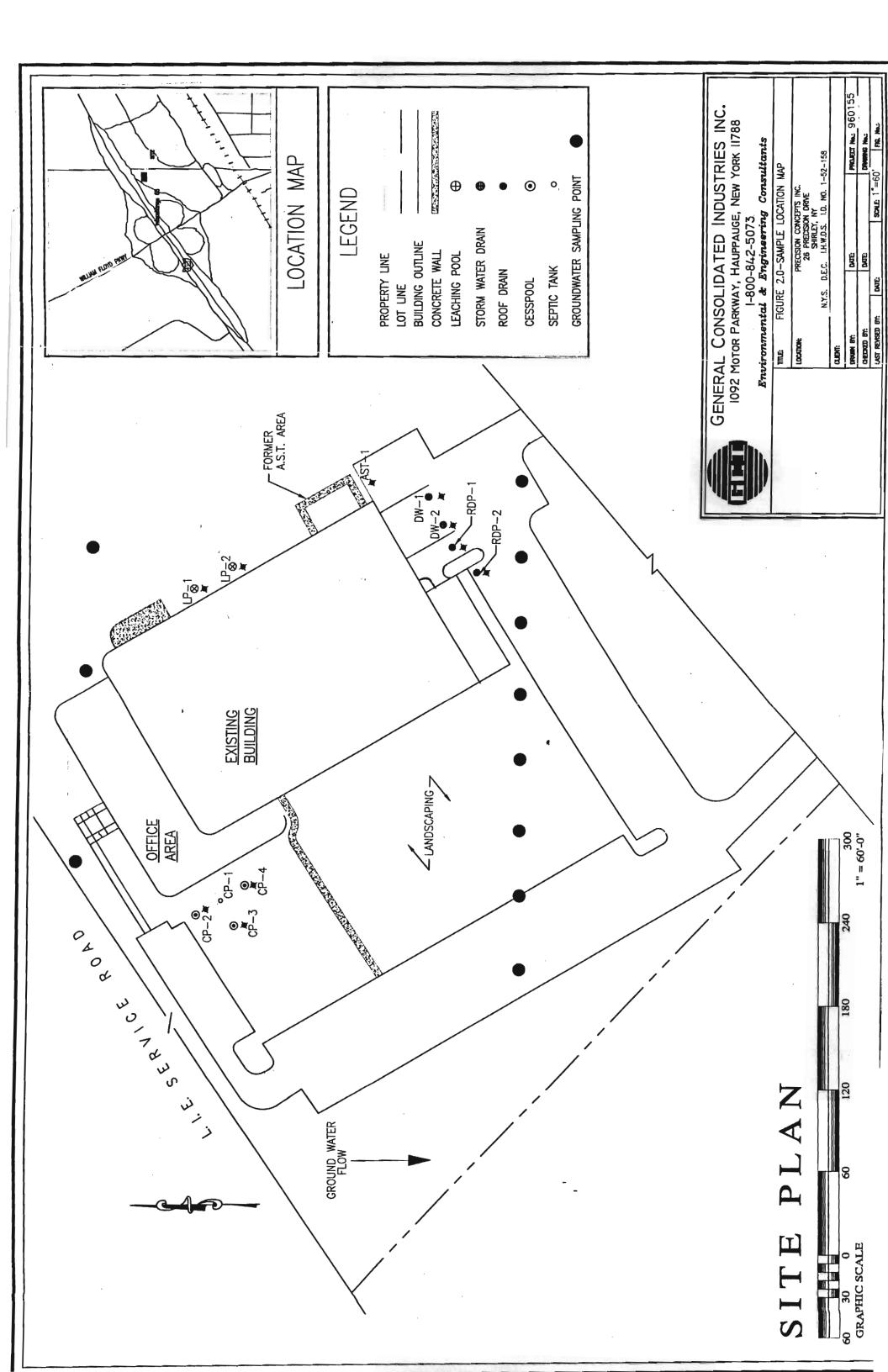


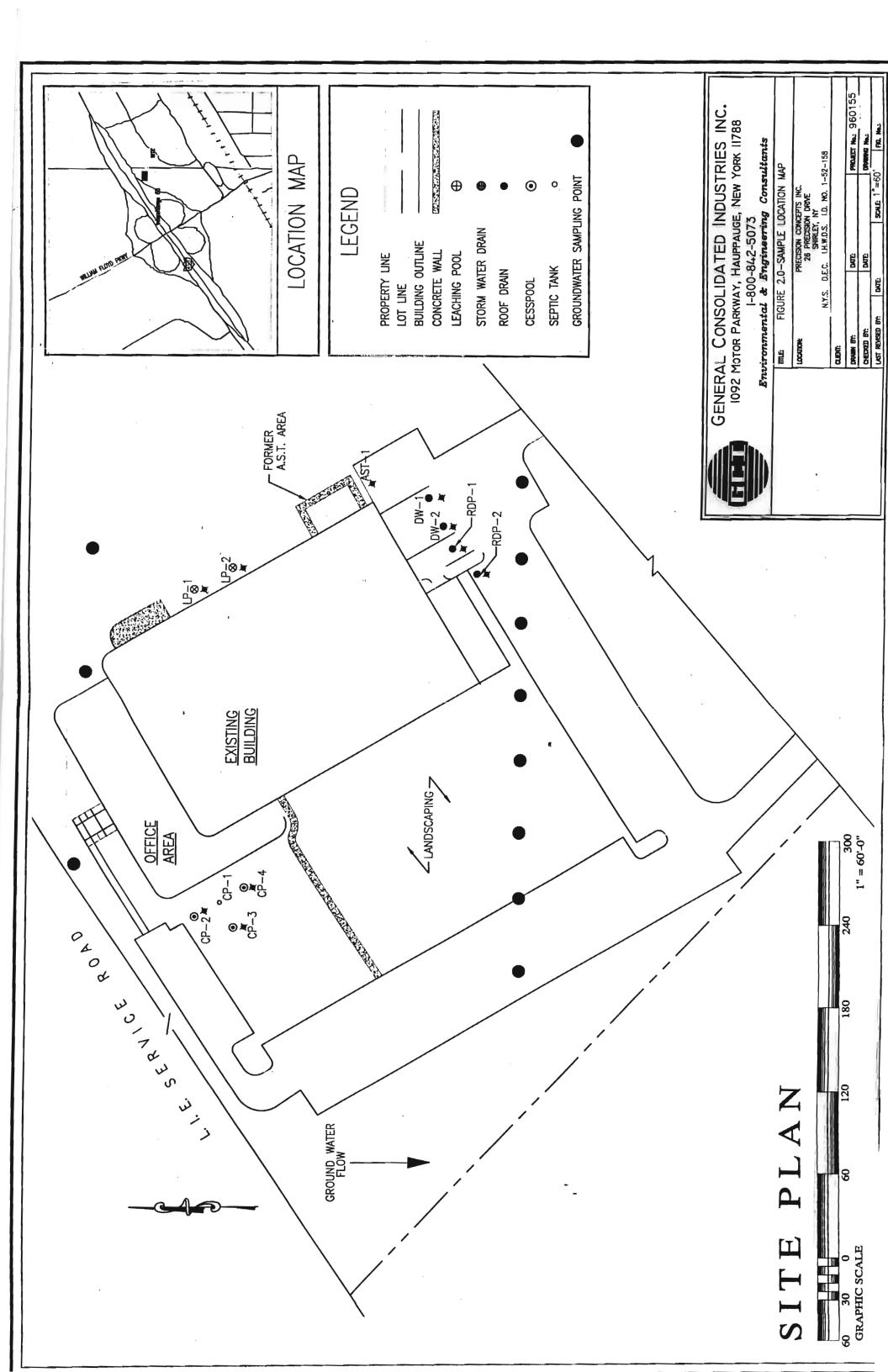
U.S.G.S. 7.5 MINUTE TOPOGRAPHIC MAP

26 Precision Drive Shirley, New York

Scale: 1,24000 Map Name: Bellport, NY







HEALTH AND SAFETY PLAN (HASP) FOR FOCUSED REMEDIAL INVESTIGATION ACTIVITIES

26 PRECISION DRIVE SHIRLEY, NEW YORK 11967

AUGUST 2000

Prepared by:

Kempey Engineering 4 Brunswick Drive Northport, New York 11731 516-368-3324

and

General Consolidated Industries, Inc. (GCI) 1092 Motor Parkway Hauppauge, New York 11788 631-851-1600

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SITE WORKER HEALTH AND SAFETY STATEMENT

I have read the Health and Safety Plan (HASP) for the Remedial Investigation at the 26 Precision Drive, Shirley, New York, and I have reviewed and understand the potential hazards and the precautions/contingencies of each potential hazard.

I agree to abide by the stipulations of this HASP and further agree to hold Kempey Engineering or General Consolidated Industries, Inc. (GCI) harmless from, and indemnify against, any accidents which may occur as a result of activities at the site regardless of whether or not they were covered in the HASP.

(Sign)	(Representing)
(Printed Name)	(Date)
(Sign)	(Representing)
(Printed Name)	(Date)
(Sign)	(Representing)
(Printed Name)	(Date)
(Sign)	(Representing)
(Printed Name)	(Date)

1.0 <u>INTRODUCTION</u>

This Health and Safety Plan (HASP) has been written for compliance with "OSHA Hazardous Waste Operations Standards (29 CFR 1910.120)", the guidance documents, "Standard Operating Safety Guidelines (Office of Solid Waste and Emergency Response, 1988)", and the "Occupational Safety and Health Guidance Manual for Hazardous Waste Activities (US Department of Health and Human Services, 1985)".

1.1 Scope and applicability of the HASP

This HASP is designed to be applicable to locations where soil sampling are performed at the 26 Precision Drive site (the "site") in Shirley, New York by all parties that either perform or witness the activities on site. This HASP may also be modified or amended to meet specific needs of the work proposed. This HASP will detail the site safety procedures, site background, and safety monitoring. Contractors will be required to adopt this HASP in full.

The Health and Safety Officer (HSO) will be present at the site to inspect the implementation of the HASP, however, it is the sole responsibility of the contractor(s) to comply with the HASP.

The HASP has been formulated as a guide to complement professional judgement and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen site conditions which may arise.

1.2 Site Work Zone and Visitors

The site work zone (aka exclusion zone) during the soil sampling will be a thirty (30) foot radius about the work location.

This work zone may be extended if, in the judgement of the health and safety officer (HSO), site conditions warrant a larger work zone.

No visitors will be permitted within the work zone without the consent of the HSO. All visitors will be required to be familiar with, and comply with, the HASP. The HSO will deny access to those whose presence within the work zone is unnecessary or those who are deemed by the HSO to be in non-compliance with the HASP.

All site workers including the contractors will be required to have forty (40) hour hazardous material training (eight (8) hour refresher courses annually), respirator fit test certification, and medical surveillance as stated in 29 CFR 1910.120.

Copies of documentation certifying the above listed requirements will be kept at the site in the possession of the HSO.

The HSO will also give an on-site health and safety discussion to all site personnel, including the contractors prior to initiating the site work. Workers not in attendance during the health and safety talk with be required to have the discussion with the HSO prior to entering the work zone.

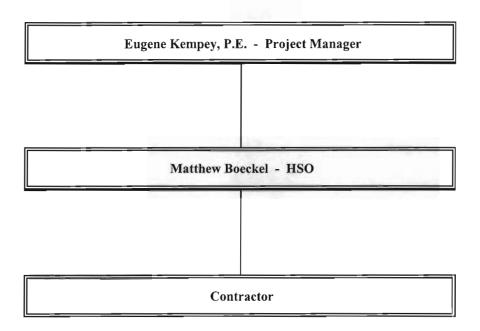
Emergency telephone numbers and directions to the nearest hospital will be kept at the site in the possession of the HSO and will be available to all site workers and visitors.

2.0 KEY PERSONNEL/ALTERNATES

The key personnel/alternates and their responsibilities are given in Figure 1. The project manager for this project is Mr. Eugene Kempey, P.E. The project hydrogeologist will be Mr. Matthew Boeckel, Senior Hydrogeologist. Mr. Boeckel will also act as HSO.

FIGURE 1

Personnel Organizational Responsibility Chart For Health and Safety



3.0 <u>SITE BACKGROUND</u>

3.1 Site History and Known Chemical Constituents at the Site

The site is located at 26 Precision Drive, identified on the tax map as Section 584, Block 1, Lot 4.034. The subject site is approximately 1,343 feet east of William Floyd Parkway, Town of Brookhaven, Suffolk County, Long Island, New York. The subject property is located in a commercial neighborhood, the site is bordered on the north by the Long Island Expressway, to the south and west of the site are commercial buildings and to the east is vacant undeveloped land. Brookhaven National Laboratory (BNL) is located less than one-eighth (1/8) of a mile to the north (upgradient) of the subject property. There has been documented contamination of the groundwater in the vicinity of the subject site with 1,1,1-trichloroetane (TCA) and dichloroethane (DCA). The chemicals known to be present at the site are presented in Table 1 and 2.

TABLE 1

Compounds Detected In Groundwater Samples With Threshold Limit Values

CONTAMINANT	SHORT TERM EXPOSURE LIMIT (STEL) 15 MINUTES	TIME WEIGHTED AVERAGE EXPOSURE LIMIT 8 HOUR	
Trichloroethane (TCA)	450 ppm	50 ppm	
Dichloroethane (DCA)	100 ppm	100 ppm	

4.0 TASK/OPERATION HEALTH AND SAFETY ANALYSIS

This section will present health and safety analysis for the soil sampling tasks.

4.1 Groundwater Sampling Safety Analysis

Sampling of groundwater will be performed by Kempey Engineering or GCI personnel using a Geoprobe® Drill Rig. The depth to groundwater is estimated to be forty-five (45) feet below grade at the site. Kempey Engineering and/or GCI personnel will be present to observe the drilling and the health and safety operations. In general, Kempey Engineering or GCI will employ one (1) to two (2) persons at the site. No drilling or other site operations will be conducted by contractors without the presence of a Kempey Engineering or GCI representative on site. In the event that the HSO is not present on the site, the Assistant HSO will implement the HASP.

Based on the site history it has been determined that known potential chemical concerns consist of volatile organic compounds (VOCs) and metals in the soil and groundwater at site.

Organic vapor concentrations (OVC) will be monitored in the work zone by utilizing a HNU Photoionization Detector (PID). The PID will be "zeroed" by exposing the PID to a canister of hydrocarbon-free air (<0.1 parts million (ppm) hydrocarbons). Background organic vapor concentrations (OVC) will then be established in the work zone prior to drilling and recorded in the HSO field book.

Upon commencement of drilling, PID readings will be obtained in the workers' breathing zone. A PID reading will also be taken at the borehole approximately every ten (10) minutes thereafter. At the discretion of the HSO, PID readings may be obtained more frequently. All readings and observations will be recorded in the HSO field book. PID air monitoring will be conducted by Kempey Engineering or GCI personnel.

Steady-state PID readings greater than five (5) ppm in the worker's breathing zone will require upgrading to Level "C" personal protective equipment. Steady-state readings, for this purpose, will be defined as readings exceeding five (5) ppm above background for a minimum of ten (10) seconds. Readings will be obtained at points approximately one (1) foot above and then around the borehole. These points will define the worker's breathing zone.

Upon encountering PID levels greater than five (5) ppm above background in the worker's breathing zone, all personnel will be evacuated from the work zone in the upwind direction (if applicable). Specific evacuation routes will be discussed prior to commencement of work at each location based on work location and wind direction. In addition, an evacuation meeting place will be determined. Level "C" personal protection will be implemented including full-face air-purifying respirators with dust and organic vapor cartridges (personal protective equipment will be described in greater detail in Section 7.0). All Kempey Engineering or GCI personnel and contractors must be properly trained and fit tested prior to donning respirators. If, at any time, PID readings exceed steady-state levels greater than fifty (50) ppm above background, or any conditions exist which the HSO determines will require Level "B" personal protective equipment, all work at the site will cease immediately and all personnel will evacuate the work zone. Evacuation will occur in the upwind direction if discernable. Level "B" conditions are not anticipated to be encountered; however, if Level "B" conditions arise, no site work will be performed by Kempey Engineering, GCI or contractors and a complete evaluation of the operation will be performed and this HASP will be modified.

All drilling personnel will be required to wear chemical-resistant gloves (such as butyl or nitrile) when the potential for dermal contact with the soil samples is possible. Dermal contact with soils removed from the ground by the Geoprobe® operations will be avoided.

4.2 Other Safety Considerations

4.2.1 Noise

During Geoprobe® operations, operation of generators, or any other operation which may generate potentially harmful levels of noise, the HSO will monitor noise levels with a handheld sound level meter. Noise levels will be monitored in decibels (dB) in the A-weighted, slow-response mode. Noise level readings which exceed the twenty-nine (29) CFR 1920.95 permissible noise exposure limits will require hearing protection (see Table 2 for permissible noise exposures).

Hearing protection will be available to all site workers and will be required for exceedance of noise exposure limits. The hearing protection will consist of foam, expansion-fit earplugs (or other approvable hearing protection) with an Environmental Protection Agency (EPA) noise reduction rating of at least twenty-nine (29) dB. Hearing protection must alleviate worker exposure to noise to an eight (8) hour time-weighted average of eighty-five (85) dB or below. In the event that the hearing protection is inadequate, work will cease until a higher level of hearing protection can be incorporated.

TABLE 2
Permissible Noise Exposures*

Duration Per Day (Hours)	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
	110
1/4 or less	115

Note: When the daily noise exposure is composed of two (2) or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1+C_2/T_2$ C_n/T_n exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

* Standards derived from 29 CFR 1910.95

4.2.2. Slip/Trip/Fall Preventative Measures

To reduce the potential for slipping, tripping, or falling, the work zone will be kept clear of unnecessary equipment. All site workers will be required to wear work boots with adequate tread to reduce the potential for slipping (work boots must be leather or chemical-resistant and contain steel toes and steel shanks).

4.2.3 Insects and Ticks

Insect and tick problems are expected to be minimal. Potential insect problems include, but are nor limited to, bees, wasps, and hornets. Prior to commencement of work, each work area will be surveyed for nests and hives to reduce the possibility of disturbing these insects. In addition, each site worker will be asked to disclose any allergies related to insect stings or bites. The worker will be requested to keep his or her anti-allergy medicine on site.

Tick species native to Long Island consist of the pinhead-sized deer tick and the much larger dog tick. All site workers will be advised to avoid walking through tall grassy areas where possible and will be advised to check for ticks on clothing periodically.

4.2.4 Heat/Cold Stress

Heat stress may become a concern especially if protective clothing is donned which will decrease natural ventilation. To assist in reducing heat stress the following measures will be taken:

- An adequate supply of water or other liquids will be brought on site. To prevent dehydration, personnel will be encouraged to drink generous amounts of water even if not thirsty.
- A shady rest area will be designated (such as beneath the trees in the northeast corner of the property) to provide shelter during sunny days).
- In hot weather, workers wearing protective clothing may be rotated. When the temperature is over seventy (70) degrees Fahrenheit and personnel are wearing protective clothing, heat stress monitoring may be implemented as follows:

- Heart rate may be measured by counting the radial pulse for thirty (30) seconds at the beginning of the rest period. The heart rate should not exceed 110 beats per minute. If the rate is higher, the next work period will be shortened by ten (10) minutes (or 33%). If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle will be shortened by 33%. The HSO will decide on the length of work periods and rest periods based on site conditions.
- Body temperature may be measured, if deemed necessary, at the beginning of the rest period. Oral temperature should not exceed ninety-nine (99) degrees Fahrenheit. If it does, the next work period will be shortened by ten (10) minutes (or 33%). However, if the oral temperature exceeds 99.7 degrees Fahrenheit at the beginning of the next period, the following work cycle will be further shortened by 33%. Work will not re-commence until by temperature has dropped below ninety-nine (99) degrees Fahrenheit.

Indications of heat stress range from mild (fatigue, irritability, anxiety, decreased concentration, dexterity or movement) to fatal. Medical help will be obtained for serious conditions.

Heat related problems are:

Heat Rash

Caused by continuous exposure to heat and humid air and aggravated by chafing cloths. Decreases ability to tolerate heat as well as being a nuisance.

Heat Cramps

Caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.

Heat Exhaustion

Caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.

Heat Stroke

The most severe form of heat stress. Can be fatal. Medical help must be obtained immediately. Body must be cooled immediately to prevent severe injury and/or death. Signs: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Cold exposure is a concern if work is conducted during cold weather or marginally cold weather during precipitation periods or moderate to high wind velocity periods. To assist in reducing cold exposure the following measure will be taken:

- All personnel will be required to wear adequate and appropriate clothing. This will
 include head gear to prevent the high percentage loss of heat that occurs in this area
 (thermal liners for hard hats if hard hats are required).
- Provide a readily available warm shelter near each work zone.
- Carefully schedule work and rest periods to account for the current temperature and wind velocity conditions.
- Monitor work patterns and physical condition of workers and rotate personnel, as necessary.

Indications of cold exposure range from shivering, dizziness, numbness, confusion, weakness, impaired judgement, impaired vision to drowsiness. Medical help will be obtained for serious conditions if they occur.

Cold exposure related problems are:

Frost Bite

Ice crystal formation in body tissues. The restricted blood flow to the injured part results in local tissue destruction.

Hypothermia

Severe exposure to cold temperature resulting in the body losing heat at a rate faster than the body can generate heat.

The stages of hypothermia are shivering, apathy, loss of consciousness, decreasing pulse rate and breathing rate and death.

4.2.5 Potential Electrical Hazards

Potential electrical hazards consist mainly underground power lines. Underground potential electrical hazards will be minimized by having a utility markout performed for the site. In addition, available as-built site blueprints will be used to avoid contact with subsurface utility lines or structures. As a final precaution, prior to drilling at any location, post-hole digging or hand auguring will be performed by the drillers to a depth of three (3) to four (4) feet to check for the existence of subsurface utility lines or structures.

4.2.6 The Buddy System

All activities in contaminated or potentially contaminated areas will be conducted by pairing off the site workers in groups of two (2) (or three (3) if necessary). Each person (buddy) will be able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the HSO or others if emergency help is needed.

The buddy system will be instituted at the beginning of each work day. If new workers arrive on site, a buddy will be chosen prior to the new worker entering the work zone.

4.2.7 Site Communications

Two (2) sets of communication systems will be established at the site: internal communication among personnel on-site, and external communication between on-site and off-site personnel.

Internal communication will be used to:

- Alert team members to emergencies.
- Pass along safety information such as heat stress check, protective clothing check,
 etc.
- Communicate changes in the work to be accomplished.
- Maintain site control.

Due to ambient noise, verbal communications may be difficult at times. The HSO will carry a whistle (and compressed air horn if respirators are donned) to signal site workers. A single whistle blast will be the signal to immediately evacuate the work zone through the access control point. This signal will be discussed with all site workers prior to commencement of work.

An external communication system between on-site and off-site personnel will be established to:

- Coordinate emergency response
- Report to the Project Manager
- Maintain contact with essential off-site personnel

A field telephone will be available at all times in the HSO's vehicle. In addition, the nearest stationary phone will be identified prior to the commencement of site operations and this location will be relayed to all site workers.

4.2.8 General Safe Work Practices

- No smoking, eating, drinking, or application of cosmetics in the work zone.
- No matches or lighters in the work zone.
- All site workers will enter/exit work zone through the site access point.
- Any signs of contamination, radioactivity, explosivity, or unusual condition such as dead animals will require evacuating the site immediately and reporting the information to the HSO.
- Loose fitting clothing or loose long hair will be prohibited in the work zone during drilling operations.
- A signal person will direct the backing of work vehicles.
- Equipment operators will be instructed to check equipment for abnormalities such as oozing liquids, frayed cables, unusual odors, etc.

5.0 PERSONNEL TRAINING REQUIREMENTS

All Kempey Engineering or GCI personnel and contractor personnel will receive adequate training prior to entering the site. Kempey Engineering or GCI and contractor's personnel will, at a minimum, have completed OSHA approved, forty (40) hour hazardous materials site safety training and OSHA approved, eight (8) hour safety refresher course within one (1) year prior to commencing field work. The HSO will have received the OSHA approved, eight (8) hour course on managing hazardous waste operations. In addition, each worker must have a minimum of three (3) days field experience under the direct supervision of a trained, experienced supervisor.

Prior to site field work, the HSO will conduct an in-house review of the project with respect to health and safety with all Kempey Engineering or GCI personnel who will be involved with field work at the site. The review will include discussions of signs and symptoms of chemical exposure and heat stress that indicate potential medical emergencies presented in Table 3. In addition, review of personal protective equipment will be conducted to include the proper use of air-purifying respirators.

TABLE 3

Signs & Symptoms of Exposure to Chemicals Detected at the Subject Site

TYPE OF HAZARD	SIGNS AND SYMPTOMS
Chemical Hazard	Behavioral changes
	Breathing difficulties
	Changes in complexion of skin color
	Confusion
	Coordination difficulties
	Coughing
	Depression
	Dermatitis
	Dilated Pupils
	Dizziness
	Euphoria
	Fatigue and/or weakness
	Flushed face and/or neck
	Insomnia
	Irregular heartbeat
	Irritability
	Irritation of eyes, nose, respiratory tract, skin or throat
	Headache
	Lacrimation
	Light-headedness
	Muscle fatigue
	Nausea
	Nervousness
	Numbness in limbs
Chemical Hazard	Paresthesia

TYPE OF HAZARD	SIGNS AND SYMPTOMS
	Sleepiness
	Tingling
	Tremors
	Vertigo
	Visual disturbance
	Vomiting
Heat Exhaustion	Clammy skin
	Confusion
	Dizziness
	Fainting
	Fatigue
	Heat rash
	Light-headedness
	Nausea
	Profuse sweating
	Slurred speech
	Weak pulse
Heat Stroke (may be fatal)	Confusion
	Convulsions
	Hot skin, high temperature (yet may feel chilled)
	Incoherent speech
	Staggering gait
	Sweating stops (yet residual sweat may be present)
	Unconsciousness

6.0 MEDICAL SURVEILLANCE PROGRAM

All workers at the site must participate in a medical surveillance program in accordance with 29 CFR 1910.120. A medical examination and consultation must have been performed within the last twelve (12) months to be eligible for field work.

The content of the examination and consultation will include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances, health hazards, and fitness for duty including the ability to wear required personal protective equipment under conditions (i.e., temperature extremes) that may be expected at the work site.

All the medical examinations and procedures shall be performed by, or under the supervision of, a licensed physician.

The physician shall furnish a written opinion containing:

- The results of the medical examination and tests.
- The physician opinion as to whether the employee has any detected medical conditions which would place the worker at increased risk of material impairment of the employee's health from work in hazardous waste operations.
- The physician's recommended limitations upon the worker assigned to the work.
- A statement that the worker has been informed by the physician of the results of the medical examination and any further examination or treatment.

An accurate record of the medical surveillance will be retained. The record will consist of at least the following information:

- The name and social security number of the employee.
- Physicians written opinions, recommended limitations, and results of examinations and tests.
- Any worker medical complaints related to exposure to hazardous substances.

These medical records will be kept on file for a duration of thirty (30) years after the project is completed. EPA will be given ninety (90) days notification prior to destroying the records.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 General Considerations

The two (2) basic objectives of the personal protective equipment (PPE) are to protect the wearer from safety and health hazards, and to prevent the wearer from incorrect use and/or malfunction of the PPE.

Potential site hazards have been discussed previously in Section 4.0. The duration of site activities is estimated to be three (3) days. All work is expected to be performed during daylight hours and workdays, in general, are expected to be eight (8) to ten (10) hours in duration. Any work performed beyond daylight hours will require the permission of the HSO. This decision will be based on the adequacy of artificial illumination and the type and necessity of the task being performed.

Personal protection levels for the site activities, based on past investigations, are anticipated to be Level "D" with the possibility of upgrading to Level "C". The equipment included for each level of protection is provided as follows:

Level "C" Protection

Personnel protective equipment:

- Air-purifying respirator, full-face.
- Chemical-resistant clothing includes: Tyvek (spunbonded olefin fibers) for particulate and limited splash protection or Saranex (plastic film-laminated Tyvek) for permeation resistance to solvents.
- Coveralls*, or
- Long cotton underwear.*
- Gloves (outer), chemical-resistant.
- Gloves (inner), chemical-resistant.
- Boots (outer), leather or chemical-resistant, steel toe and shank.
- Boot covers (outer), chemical-resistant (disposable)*.
- Hard hat (face shield)*.
- Escape mask*.
- Two-way radio communications (inherently safe)*.

(*) Optional

Criteria for Selection of Level "C" Protection

Meeting all of these criteria permits use of Level "C" Protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV).
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are below fifty (50) ppm on the OVA.

Level "D" Protection

Personnel protective equipment:

- Coveralls
- Gloves*
- Boots/shoes, leather or chemical-resistant, steel toe and shank
- Safety glasses or chemical splash goggles*
- Hard hat (face shield*)
- Escape mask*
- (*) Optional

Criteria for Selection for Level "D" Protection

Meeting any of these criteria allows use of Level "D" Protection:

- No contaminant levels above five (5) ppm organic vapors or dusty conditions are present.
- Work functions preclude splashes, immersion, or the reasonable potential for unexpected inhalation of any chemicals above the TLV.

Additional Considerations for Selecting Levels of Protection

Another factor which will be considered in selecting the appropriate level of protection is heat and physical stress. The use of protective clothing and respirators increases physical stress, in particular, heat stress on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly fitted hood against the respirator face peace, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of selecting a level of protection will be balanced against the increased probability of heat stress and accidents.

7.2 <u>Donning and Doffing Ensembles</u>

Donning an Ensemble

A routine will be established and practiced periodically for donning a Level "C" ensemble. Assistance may be provided for donning and doffing since these operations are difficult to perform alone.

Table 4 lists sample procedures for donning a Level "C" ensemble. These procedures should be modified depending on the particular type of suit and/or when extra gloves and/or boots are used.

Doffing an Ensemble

Exact procedures for removing Level "C" ensembles must be established and followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others.

Doffing procedures are provided in Table 5. These procedures should be performed only after decontamination of the suited worker. They require a suitably attired assistant. Throughout the procedures, both worker and assistant should avoid any direct contact with the outside surface of the suit.

TABLE 4

Sample Donning Procedures

- 1. Inspect the clothing and respiratory equipment before donning (see Inspection in subsection 7.4).
- 2. Adjust hard hat or headpiece if worn, to fit user's head.
- 3. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.
- 4. Put on chemical-resistant safety boots over the feet of the suit. Tape the leg cuff over the tops of the boots.
- 5. Don the respirator and adjust it to be secure, but comfortable.
- 6. Perform negative and positive respirator facepiece seal test procedures:
 - To conduct a negative-pressure test, close the inlet part with the palm of the hand or squeeze the breathing tube so it does not pass air, and gently inhale for about ten (10 seconds. Any inward rushing of air indicates a poor fit. Note the a leaking facepiece may be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.
 - To conduct a positive-pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.
- 7. Depending on type of suit:
 - Put on inner gloves (surgical gloves).
 - Additional overgloves, worn over attached suit gloves, may be donned later.
- 8. Put on hard hat.
- 9. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly.

TABLE 5

Doffing Procedures

- 1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.
- 2. Remove respirator by loosening straps and pulling straps over the top of the head and move mask away from head. Do not pull mask over the top of the head.
- 3. Remove arms, one at a time, from suit, avoiding any contact between the outside surface of the suit and wearer's body and lay the suit out flat behind the wearer. Leave internal gloves on, if any.
- 4. Sitting, if possible, remove both legs from the suit.
- 5. After suit is removed, remove internal gloves by rolling them off the hand, inside out.

7.3 Respirator Fit Testing

The fit or integrity of the facepiece-to-face seal of a respirator affects its performance. Most facepieces fit only a certain percentage of the population; thus each facepiece must be tested on the potential wearer in order to ensure a tight seal. Facial features such as scars, hollow temples, very prominent cheekbones, deep skin creases, dentures or missing teeth, and the chewing of gum and tobacco may interfere with the respirator-to-face seal. A respirator shall not be worn when such conditions prevent a good seal. The worker's diligence in observing these factors shall be evaluated by periodic checks. Fit testing will comply with 29 CFR 1910.1025 regulations.

7.4 <u>Inspection</u>

The PPE inspection program will entail five (5) different inspection:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The inspection checklist is provided in Table 6. Records will be kept of all inspection procedures. Individual identification numbers will be assigned to all reusable pieces of equipment and records should be maintained by that number. At a minimum, each inspection should record the ID number, date, inspector, and any unusual conditions or findings. Periodic review of these records may indicate an item or type of item with excessive maintenance costs or a particularly high level of down-time.

TABLE 6

PPE Inspection Checklist

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
 - Imperfect seams
 - non-uniform coatings
 - Tears
 - Malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
 - Observe for cracks
 - Observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
 - Discoloration
 - Swelling
 - Stiffness

During the work task, periodically inspect for:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Closure failure
- Tears
- Punctures
- Seam discontinuities

7.5 Storage

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Storage procedures are as follows:

Clothing:

- Potentially contaminated clothing will be stored in an area separate from street clothing.
- Potentially contaminated clothing will be stored in a well-ventilated area, with good air flow around each item, if possible.
- Different types and material of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake.
- Protective clothing will be folded or hung in accordance with manufacturer's recommendations.

Respirators:

• Air-purifying respirators should be dismantled, washed, and placed in sealed plastic bags.

7.6 Maintenance

Specialized maintenance will be performed only by the factory or an authorized repair person. Routine maintenance, such as cleaning, will be performed by the personnel to which the equipment is assigned. Respirators will be cleaned at the end of each day with alcohol pads or, preferably, by washing with warm soapy water.

7.7 <u>Decontamination Methods</u>

All personnel, clothing, equipment, and samples leaving the contaminated (work zone) area of the site must be decontaminated to remove any harmful chemicals or infectious organisms that may have adhered to them. Decontamination methods either (1) physically remove contaminants, (2) inactivate contaminants by chemical detoxification or disinfection/sterilization, or (3) remove contaminants by a combination of both physical and chemical means. In many cases, gross contamination can be removed by physical means involving dislodging/displacement, rinsing, wiping off, and evaporation. Contaminants that can be removed by physical means include dust, vapors, and volatile liquids. All reusable equipment will be decontaminated by rinsing in a bath of detergent and water (respirators, gloves to be reused). Monitoring equipment will be decontaminated by wiping with paper towels and water.

All used PPE to be discarded will be placed in a fifty-five (55) gallon drum and stored in a secure place at the site while awaiting final disposition.

The effectiveness of the decontamination will be evaluated near the beginning of site activities and will be modified if determined to be ineffective. Visual observation will be used for this purpose. The HSO will inspect decontaminated materials for discoloration, stains, corrosive effects, visible dirt, or other signs of possible residual contamination.

8.0 <u>DECONTAMINATION PROCEDURES FOR SAMPLING AND DRILLING EQUIPMENT</u>

All sampling equipment shall be decontaminated prior to, and following, use at each groundwater sampling location. Decontamination procedures shall consist of the following:

- 1. Scrub equipment in a bath of low-phosphate detergent and potable water.
- 2. Potable water rinse.
- 3. One percent (1%) nitric acid rinse.
- 4. Potable water rinse.
- 5. Methanol followed by hexane rinse.
- 6. distilled water rinse, air dry.
- 7. Aluminum foil wrap, shiny side out, for transport.

Personal protective equipment decontamination has been discussed in Section 7.7.

9.0 CALIBRATION PROCEDURES, FREQUENCIES, AND MAINTENANCE

This section will present the calibration procedures, frequencies, and maintenance for the health and safety field monitoring instruments.

The use of the monitoring equipment is presented as follows (the manufacturer's owner's manuals for all equipment used will be present at the site):

1. HNU - this instrument is a photoionization detector (PID) that measures the concentration of airborne ionizable gases and vapors. The HNU does not distinguish between individual compounds and will not read methane. The calibration will be performed with a cylinder of "zero gas" (hydrocarbon free air) to "zero" the instrument and a 100 ppm cylinder of isobutylene to calibrate the span.

The calibration procedures and frequencies for each instrument are presented as follows:

HNU (Photoionization Detector)

Isobutylene at 100 ppm in air will be used as Span Gas. A commercial zero grade gas will be used as the zero gas. To calibrate the instrument, use the Calibration Kit as follows:

- 1. Connect the supplied regulator to the Span Gas Cylinder. Hand tighten the fittings.
- 2. Open the valve on the gas bag by turning the valve stem fully counter clockwise.
- 3. Attach the gas bag adapter nut to the regulator. Hand tighten the fittings.
- 4. Turn the regulator knob counter clockwise about half turn to start the flow of gas.
- 5. Fill the gas bag about half full and then close the regulator fully clockwise to turn off the flow of gas.
- 6. Disconnect the bag from the adapter and empty it. Flush the bag a few times with the Span Gas and then fill it.
- 7. Close the gas bag by turning the valve clockwise.

- 8. Press SETUP and select the desired Cal Memory with arrow keys and press ENTER. Press EXIT to leave Setup.
- 9. Press CAL and expose HNU to Zero Gas. Press ENTER and HNU sets its zero point.
- 10. HNU then asks for the Span Gas concentration. Enter the Known Span Gas concentration and then connect the Span Gas bag adapter to the inlet.
- 11. Press ENTER and HNU sets its sensitivity.
- 12. When HNU's display reverts to normal, HNU is calibrated and ready for use. Remove the Span Gas bag from the inlet.

The instrument will be calibrated prior to the commencement of each day's work. The instrument will be charged overnight prior to each day's work.

10.0 EMERGENCY RESPONSE PLAN

This section will present the Emergency Response Plan (ERP) for the site. Pre-emergency planning will consist of reviewing the ERP with all workers at the site prior to initiation of work.

Personnel Roles

It is anticipated that during the drilling and well installation activities at the site, in general, three (3) persons will be on the site: the HSO, the driller, and the driller's assistant. Should an emergency situation arise at the site, the HSO will assume control and decision-making. The HSO will also resolve all dispute concerning health and safety requirements and precautions. The HSO will also:

- Be authorized to seek and purchase supplies as necessary.
- Have control over activities of everyone entering the site.

The HSO will communicate, by field telephone or other, with off-site personnel to include the Project Manager to evaluate data and assist in the decision-making process. Telephone numbers for the fire department, police ambulance, poison control center, Suffolk County Department of Health Services (SCDHS), and New York State Department of Environmental Conservation (NYS DEC) Spill Response Department (SRD), are listed on the next-to-last page of this document. The hospital which will be utilized during an emergency will be Brookhaven Memorial Hospital. The directions to the hospital, along with the hospital's emergency room telephone number are presented as Appendix A of this document.

Copies of Appendix A of this document will be available at the site and will be placed in all vehicles of personnel involved in activities at the site.

Internal communications will consist of a single whistle (or compressed air horn if Level "C" is donned) blast. This blast will signal all workers to evacuate the work zone by the nearest exit.

Response Follow-Up

Following an emergency, or incident, a detailed report will be generated by the HSO. All equipment will be restored to pre-emergency conditions. The HASP will be reviewed following an emergency to determine if it provides adequate information to assist in dealing with the emergency. The HASP may be revised to incorporate additional information as needed.

Emergency Recognition and Prevention

Before daily work assignments begin, each day a brief on-site meeting will be held by the HSO which will address health and safety issues related to the day's work. Prior to initiation of work, a detailed on-site health and safety meeting will be held to review all potential hazards, contingencies, and safety measures.

Safe Distances and Places of Refuge

The main potential cause of work zone evacuation is a significant vapor release. Vapor release evacuation will be discussed prior to drilling at each site and in general will be in the upwind direction. Wind direction will be monitored at each work location and all workers will be notified of the direction of evacuation prior to commencement of work. Safe distances will be discussed at each location and determined by the HSO. The OVA will be used to determine if workers have evacuated a sufficient distance.

At all times, vehicles which may be utilized in an emergency for transport to the hospital (or other destination) will have clear access to leave the site. The HSO will assure that an emergency vehicle does not become blocked-in by other vehicles.

Site Security and Control

The HSO will control entry of personnel into the work zone. No unnecessary person shall be permitted in the work zone.

Decontamination Procedures During Emergencies

In the event of a medical emergency, decontamination will be performed if it does not interfere with essential treatment. Decontamination will be performed by washing, rinsing, and/or cutting off protective clothing and equipment.

If decontamination cannot be performed, the victim will be wrapped in plastic to reduce contamination to other personnel. Emergency and off-site medical personnel will be alerted to the potential contamination.

Emergency Medical Treatment and First Aid

Medical emergencies will be treated, in general, by medical experts by transporting the victim to the nearby hospital.

A first aid kit will be present on site for minor medical treatment.

APPENDIX A

Emergency Telephone Numbers,

Kempey Engineering and GCI Contact Personnel,

Directions from Precision Avenue to the Hospital

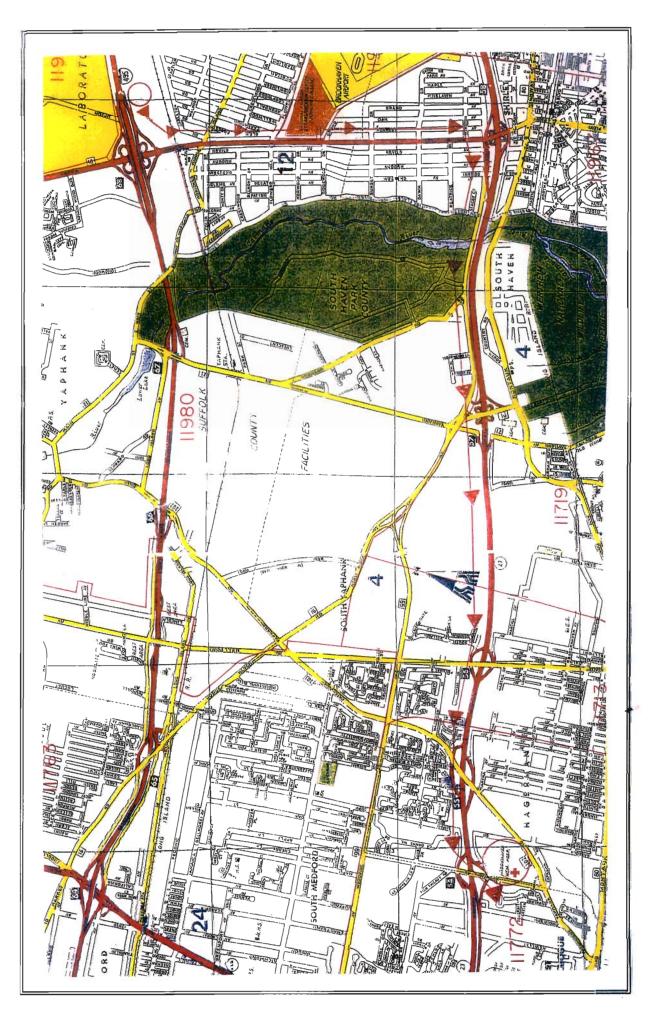
Emergency Telephone Numbers

Suffolk County Police				
Shirley Fire Department				
Ambulance (631) 924-5550				
Poison Control Center				
Suffolk County Department of Health Services				
N.Y.S. Department of Environmental Conservation (DEC) (631) 444-0320				
N.Y.S. DEC Spills Hotline				
Brookhaven Memorial Hospital Emergency				
Kempey Engineering and GCI Personnel				
Eugene G. Kempey, P.E				
Matthew Boeckel, Hydrogeologist				

Directions to Brookhaven Memorial Hospital

Brookhaven Memorial Hospital		631-657-7763
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Take Precision Drive west to William Floyd Parkway. Take William Floyd Parkway South. Take Sunrise Highway West to Hospital Road. Make a left to Hospital Road (south) the Brookhaven Memorial Hospital will be on your left.



DIRECTIONS TO BROOKHAVEN MEMORIAL HOSPITAL From 26 Precision Drive Shirley, New York