SITE SAFETY AND HEALTH PLAN

REMEDIAL INVESTIGATION

Stratford Army Engine Plant
Stratford, Connecticut

Contract Number DACW41-96D-8014
Task Order 0011

Prepared for
U.S. Department of the Army
Corps of Engineers, New York District
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K9716-6.1

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1.1 INTRODUCTION

This Site Safety and Health Plan (SSHP) establishes guidelines and requirements for safety of personnel during the performance of field activities associated with the Remedial Investigation (RI) at the Stratford Army Engine Plant (SAEP).

All employees and subcontractors of Woodward-Clyde Federal Services (W-C) involved in field activities for this project are required to abide by the provisions of this SSHP. They are required to read the SSHP and sign the attached Safety and Health Plan Compliance Agreement (Attachment 9). W-C subcontractors, and contractors (hereinafter, both referred to as Contractors) involved in field activities who adopt this SSHP for the protection of their employees are required to read the SSHP and comply with its provisions. The adoption of this SSHP does not relieve Contractors of any obligations to provide a safe working environment in accordance with all applicable federal, state and local requirements including, but not limited to, the Occupational Safety and Health Administration (OSHA) Regulations 29 CFR 1910 and 1926.

Contractors remain solely responsible for providing their employees with appropriate personal protection equipment. W-C personnel will monitor air quality per this SSHP. Contractors are encouraged to independently monitor air quality. In the event that they do not have the appropriate air monitoring equipment or otherwise choose not to monitor air quality, W-C personnel will make a reasonable effort to inform the Contractors' Site Safety and Health Officer(s) of readings measured by W-C. The Contractors are solely responsible for actions taken by their personnel based on the readings.

The health and safety guidelines and requirements presented herein are based on a review of available information and an evaluation of potential hazards. Because of the variety of possible work activities and site conditions which may be encountered and the uncertainties associated with potential health effects from exposures to various constituents which may be present, no guarantees can be made regarding the potential for health effects associated with field activities at the SAEP. This SSHP describes the health and safety procedures and equipment required for activities at the SAEP to reduce the potential for exposure of field personnel.

1.2 FOREWORD

W-C has been retained by the Department of the Army, Corps of Engineers (USACE) to conduct a Remedial Investigation at the SAEP. This SSHP is only for activities defined in the Remedial Investigation Work Plan (RIWP).

Regulations applying to the proposed field activities during the RI are listed below. These regulations will be enforced during all activities described in this SSHP.

Government Regulations	Subject
FAR Clause 52.236-13	Accident Prevention
USACE EM 385-1-1	Safety and Health Requirements Manual
OSHA 29 CFR 1926	Construction Industry Standards
OSHA 29 CFR 1910	General Industry Standards
OSHA 29 CFR 1910.120	Hazardous Waste Site Operations and Emergency Response
OSHA 29 CFR 1910.20	Recordkeeping/Recording
OSHA 29 CFR 1904	Recordkeeping/Recording
OSHA 29 CFR 1910.1000	OSHA Permissible Exposure Limits
OSHA 29 CFR 1910.134	Respiratory Protection
NIOSH/OSHA/USCG/EPA	Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

1.3 PROJECT IDENTIFICATION

CLIENT:	Department of the Army Corps of Engineers
SITE:	Stratford Army Engine Plant Stratford, Connecticut
PROJECT NO:	K9716
BUSINESS UNIT:	New York Metro
PROJECT MANAGER:	Michael Akerbergs
DATE OF SSHP:	March 27, 1998

2.1 SITE DESCRIPTION

SAEP is an industrial facility which is mostly paved or covered by buildings. Surrounding land uses are mainly light industrial, commercial, and residential.

2.1.1 SITE LOCATION

SAEP is located in Stratford, Connecticut, on the Stratford Point peninsula in the southeast corner of Fairfield County. The plant lies on the borders of the Bridgeport and Milford United States Geological Survey (USGS) Quadrangles (Figure 2-1). Latitudinal and longitudinal coordinates of SAEP are approximately 41o10' North and 73o07' West. The property consists of about 126 acres including about 49 acres of riparian rights along the Housatonic River. Existing property features are shown in Figure 2-2.

2.1.2 SITE OWNERSHIP AND OPERATIONS HISTORY

The SAEP property was used for agriculture until 1929 when the first manufacturing facility was built on about 26 acres. The property has been used for development, manufacture, and assembly of aircraft or engines since 1929. The plant history has been categorized into the following periods:

- 1929 to 1939: Sikorsky Aero Engineering Corporation developed and manufactured sea planes at the Stratford plant from 1929 to 1939.
- 1939 to 1948: Chance Vought Aircraft located its operations at the Stratford plant in 1939, and the company became known as the Vought-Sikorsky Aircraft Division. Sikorsky developed the first helicopter, but left the plant in 1943 because of overcrowding. Chance Vought developed the "Corsair" for U.S. Navy, and mass produced Corsairs during World War II. Chance Vought vacated the Stratford plant in 1948.
- 1948 to 1951: The Stratford plant was idle.
- 1951 to 1976: The U.S. Air Force procured the plant in 1951 and named it Air Force Plant No. 43. The Bridgeport Lycoming Division of the Avco Corporation was contracted by the Air Force to operate the plant. Avco developed and manufactured radial engines in the 1950s, and turbine engines in the 1960s and 1970s.
- 1976 to Present: The plant was transferred from the U.S. Air Force to the Army in 1976; at that time the plant was renamed the Stratford Army Engine Plant (SAEP). Avco was contracted by the Army to develop the AGT-1500 engine to power the Abrams tank. Avco also developed and manufactured marine and industrial engines. Avco merged with Textron in December 1985 and formed Textron Lycoming. AlliedSignal Aerospace purchased Textron Lycoming in 1994. Turbine engines for military and commercial aircraft, as well as land vehicles, continued to be developed, manufactured, and tested at SAEP until 1997. Since the cessation of AlliedSignal operations in 1997, the focus of activities at SAEP has been completion of an

environmental assessment and the preparation of the site for potential re-development.

2.2 SUMMARY OF FINDINGS FROM PREVIOUS INVESTIGATIONS

This summary presents the results of the Phase I Remedial Investigation (Phase I RI) and the Phase II Remedial Investigation (Phase II RI). Physical and chemical data on site conditions were gathered and evaluated. Results of the are summarized below.

2.2.1 Physical Characterization

- The site is underlain by fill, peat, silt and glacial deposits which are variable in lateral extent and thickness across the site.
- Groundwater contour maps drawn using groundwater level data collected during two synoptic rounds indicate that groundwater flow at the SAEP discharges to the intertidal flats, Frash Pond, and the drainage channel adjacent to the former lagoons.
- The water table is relatively flat across the site, but gets steeper within 500 ft of the shore.
- Hydraulic conductivities calculated from slug tests performed in monitoring wells indicate hydraulic conductivities generally from 12 to 15 ft/day for shallow wells, 0.01 to 2.7 ft/day in intermediate wells, and 2.5 to 6.0 ft/day in the deep wells.
- There is generally an upward vertical gradient between the deep zone and shallow zone in the immediate vicinity of the shore line. The vertical gradient between the two aquifer zones varies between upward and downward throughout the remainder of the site.

2.2.2 Chemical Characterization

2.2.2.1 Soil

Volatile Organics (VOs)

- The highest levels of VOs detected were below 10,000 mg/kg (10 mg/kg).
- The types of volatile compounds detected are consistent with past site activities.

Base Neutrals (BNs)

- With minor exceptions, BNs were generally detected in total concentrations of less than 15,000 mg/kg (15 mg/kg).
- The Poly Aromatic Hydrocarbon (PAH) BNs detected are consistent with past site activities. The ubiquitous presence of phthalates is not obviously consistent with site activities.

Acid Extractables (AEs)

- The highest concentration of AEs compounds was about 6,000 mg/kg (6 mg/kg); most were below 100 mg/kg (02/mg/kg).
- The source of AEs compounds in SAEP soils is not known.

Poly Chlorinated Biphenyls (PCBs)

- The levels of PCBs detected in SAEP soils are acceptable for industrial property site use.

Cyanide

- Cyanide was not detected in SAEP soils.

Metals

- Metals detected in SAEP soil appear to be consistent with past and present site activities with the possible exception of antimony.

2.2.2.2 Groundwater

Volatile Organics

- Shallow groundwater appears to have been impacted by releases of solvents and/or waste solvents, primarily chlorinated hydrocarbons.
- The highest concentrations of chlorinated compounds are in areas adjacent to solvent storage tanks and/or degreaser areas indicating these areas are or were possible sources of shallow groundwater contamination.
- There is also evidence that there has been a release(s) of gasoline or kerosene (jet fuel). This is evidenced by the presence of BTEX compounds at a number of locations.

Base Neutral/Acid Extractables

- BN/AE compounds have not significantly impacted groundwater quality in the shallow aquifer.

PCBs/Cyanide

- Neither PCBs nor Cyanide have impacted groundwater quality in the shallow aquifer.

Metals

- There is no clear pattern to the distribution of wells that have exceedances of one or more metals. Exceedances are randomly distributed across the site with the majority and highest exceedances occurring in wells adjacent to the tidal flats.
- The metals most frequently found in the groundwater are consistent with industrial activities (plating, manufacturing, etc.).
- The metals found in groundwater were consistent with those found in the soil.

2.2.2.3 Sediment

Volatile Organics

- Volatile organic compounds have not significantly impacted sediment at the locations sampled except at the tidal flat outfall location near the tank farm. Sediment at this location appears to have been impacted by release(s) of gasoline or kerosene (jet fuel) evidenced by the presence of BTEX compounds. This location is also near the shallow monitoring wells where the highest concentrations of VOs were detected in groundwater.

Base Neutrals

- Elevated levels of PAHs were detected in the sediment samples from most of the tidal flat outfall locations, from the tidal flat location and from the tidal drainage ditch location, while no PAHs were detected in the intertidal background samples. Sediment at these locations appear to have been impacted by a petroleum product related release(s). The vertical extent of PAH contamination was detected in the deep (12 to 24 inches) samples, as well as the shallow (0 to 12 inches) samples with some locations having higher deep PAH concentrations than the shallow samples.
- Phthalates were detected in both the site samples as well as in the intertidal background samples, and therefore may not be attributable to releases from SAEP.
- The sediment at the locations sampled has not been significantly impacted by halogenated hydrocarbons.
- Elevated levels of miscellaneous BNs were detected in the tidal drainage ditch sediment samples.

Acid Extractables

- The sediment at the locations sampled has not been significantly impacted by acid extractable compounds.

PCBs

- PCBs were detected at more than half the sample locations with the shallow and deep samples from the tidal flat outfall having significantly higher (greater than an order of magnitude) concentrations than the other locations. The fact that no PCBs were detected in the intertidal background sample suggests that their occurrence may be related to past SAEP activities.

Cyanide

- Elevated levels of cyanide were detected in samples from the tidal drainage ditch locations as well as from the tidal flat outfall locations.

Metals

- Elevated levels of metals, relative to the intertidal background samples, were detected in most of the sediment samples from the site with the concentrations of some metals

being one to two orders of magnitude more than the intertidal background samples. The metals detected in elevated concentrations are consistent with past site activities.

2.2.2.4 Surface Water

Volatile Organics

- The low concentrations of halogenated aliphatics detected in surface water samples from the intertidal outfall locations as well as from the tidal drainage ditch locations are probably associated with the effluent from outfalls.
- The detected concentrations of the ketone 2-propanone in samples from the tidal drainage ditch are probably associated with the effluent from outfalls.
- Monocyclic aromatic hydrocarbons have not impacted surface water quality in the vicinity of the SAEP.

Base/Neutrals

- PAHs were only detected at very low concentrations at two sample locations and have not impacted surface water quality.

Acid Extractables

- Acid extractables were only detected at very low concentrations at two sample locations and have not affected surface water quality.

Cyanide

- Cyanide was only detected in the sample from the tidal flat outfall location at a concentration which exceeds the USEPA acute and chronic criteria for the protection of marine aquatic life

Metals

- Elevated levels of some metals, relative to the intertidal background samples, were detected in more than half of the surface water samples from the tidal flat outfall locations and tidal drainage ditch location with the concentrations of some metals being an order of magnitude more than the intertidal background sample. The relatively high concentrations of some metals at these locations are probably associated with manufacturing processes at SAEP. The elevated concentrations of these metals appear to be diluted relatively quickly because the concentrations of these metals detected in the three tidal flat samples located a few hundred feet away were considerably lower than those detected in the tidal flat outfall location samples.

Detailed descriptions of the field activities are provided in the Field Sampling Program and procedures for the SAEP RI are provided in the Quality Assurance Project Plan and Standard Operating Procedures sections of this work plan.

This SSHP does not cover any site activities other than those listed in the above subsections of this work plan. Other possible work activities not described in this section may only be conducted after approval of an appropriate addendum to this SSHP by the Project Manager and Safety Officer, and the New York Metro Business Unit Health and Safety Manager.

This SSHP must be reviewed and reauthorized by January 1, 1999. Use of this SSHP after this date to perform the work activities described herein, or other activities in addition to those described herein, is not permitted and constitutes a violation of W-C's health and safety protocols. If work is to be performed after this date, the SSHP must be reviewed and modified, if necessary, by the New York Metro Business Unit Health and Safety Manager.

4.1 HAZARD ASSESSMENT

An assessment of the hazards has been made for the sampling activities to be conducted under the SSHP by reviewing the SAEP's historical and current operations and data compiled during previous investigations. The hazards which were assessed include:

- Biological hazards: poison ivy, mosquitoes, ticks, mice/rats, and snakes
- Chemical hazards: inhalation, ingestion and contact with the contaminants of concern
- Physical hazards: use of excavating, drilling, sampling and support equipment
- Radiological hazards

4.1.1 Biological Hazards

The surface debris, particularly the standing water and general industrial waste, and the presence of natural marshes, provides a breeding ground for numerous types of pest organisms, including mosquitoes. The use of insect repellents before donning personal protective equipment (PPE) will be encouraged. To avoid bites from rodents and snakes, personnel will check carefully for these animals before walking through grassy or debris strewn areas. A first aid kit, snake bite kit and insect repellent will be available for use in the field. In many parts of the northeast United States, tick-borne diseases pose a significant health risk during warm months. Attachment 1 presents a discussion of Ticks and Tick-Borne Diseases. Lyme disease, a bacterial (Borrelia Burgdorferi) infection carried by ticks and some species of mosquitoes, is of particular concern. Tick repellent will be available at the field office.

Poison ivy may be present at site. Appropriate clothing should be worn to prevent exposure to poison ivy and a protective barrier lotion should be worn on exposed skin. Tubes of the barrier lotion will be available at the field office.

4.1.2 Chemical Hazards

Some of the areas in which drilling and well installation will be performed are suspected of containing petroleum based materials; halogenated solvents, organic solvents, aromatic compounds, fuels, lubricating oils, cutting oils and greases. The majority of these contaminants may be released either by volatilization from their liquid form or by volatilization from contaminated soil, cement and asphalt. The majority of these organic compounds and mixtures have generally low boiling points and high vapor pressures, thus evaporation/volatilization of these compounds and mixtures may occur readily. Other nonvolatile compounds that have been positively identified in the sediments are PCB. These compounds are considered immediate dermal hazards with the potential of long-term chronic effects. The air concentration of the volatile compounds may increase during hot and dry days. In addition, the sampling activities described in Section 3.0 may increase the exposure of workers to these chemicals since ground disrupting activities may facilitate the volatilization of the volatile compounds and the risk of coming in contact with the nonvolatile compounds such as PCBs is greatly increased.

Other chemicals of concern are inorganic compounds and metals that could be found in the pavement, asphalt, soil, sediment in tidal marshes and flats, and water. These compounds include cyanides, nickel, chromium, bromine, and lead.

A summary of personal exposure information for the chemicals of concern is contained in Table 4-1. Table 4-2 presents a summary of chemical and physical properties of the chemicals of concern.

The primary exposure pathways of concern for these contaminants are inhalation and skin absorption (particularly for some of the chromium and bromine compounds).

In addition to the chemicals that may be potentially found mixed in with the soil and water, the field personnel should be cognizant of the chemicals that are handled during the day to day operations in the plant. A full inventory of these chemicals may be found within the Hazard Communication Plan, as per 29 CFR 1910.1200 for SAEP. The Material Safety Data Sheets (MSDS) may be found in the SAEP's security office.

4.1.2.1 Inhalation

Volatile organic compounds (VOs) and other organic compounds that have high vapor pressures and low boiling points may vaporize readily upon exposure to air during excavation and drilling through asphalt pavement and concrete slabs, floors and sub-floors since these structures may have acted as shields or caps, preventing volatilization. The extent and rate of volatilization will increase with increasing temperature and decreasing soil moisture levels. As a result, on-site workers will be exposed to the highest levels of organic vapors during dry, hot periods and when the air exchange or wind speed is low.

Particulate solids containing inorganic crystals, arsenic-based compounds, asbestos, cyanides and metallic compounds such as nickel, chromium and thorium may be generated during intrusive operations. The majority of the sampling activities have the potential for generating dust since they will involve breaking through concrete, asphalt and compact soil and rock.

Most of the VOs can cause irritation of the mucous membrane at the nasal cavities, trachea and lungs. Dust-containing inorganic compounds may cause inflammation and irritation of the mucous membrane at the nasal cavities, trachea and lungs and may become permanently deposited in the lung cavities (especially asbestos and silica-based compounds).

4.1.2.2 Ingestion

Since exposure may occur at any time when the field personnel are near or within the SAEP, a constant response to risk must be enforced. Ingestion of the contaminants of concern will be controlled by prohibiting eating and smoking during any field activity within the SAEP property and by requiring all field personnel to decontaminate themselves upon leaving the sampling areas.

4.1.2.3 Dermal Contact

Skin and eye contact with most of the volatile and nonvolatile contaminants can cause skin or mucous membrane irritation and inflammation. Many of these contaminants can be absorbed into the bloodstream through the skin or eyes.

Many of the inorganic contaminants and metals can cause allergic reactions to the skin and eye, thus causing irritation, inflammation, and ulcers. They may also permeate through the skin and eyes and be absorbed into the bloodstream affecting the liver, kidneys, digestive system, as well as the nervous system.

4.1.3 Physical Hazards

Possible physical hazards during sampling activities include flying debris during concrete and asphalt breaking operations. Physical hazards associated with drilling are identified and safety procedures presented in Attachment 2, Safety Guidelines for Drilling. Also, there is a risk of scalding during decon procedures where steam cleaners/power washers are used, thus the workers should avoid contact with the steam by power washing away from the user and by standing upwind of the spray. Hearing protection will be required whenever sound-pressure levels exceed 85 dB steady-state or 140 dB impulse.

In addition, high noise levels are expected during the ground breaking operations. Field workers should be aware of the slippery conditions existing at the tidal flats and tidal conditions since they can hinder sampling activities and create loose footing conditions, thus increasing the risk of falling.

A summary of the physical hazards which may be encountered while working at the SAEP is provided in Table 4-3.

4.1.4 Heat Stress and Cold Exposure

The PPE required for some activities (coveralls and respirators) places a physical strain on the wearer. The Heat Stress Casualty Prevention Plan as specified in Attachment 3 will be implemented to deal with this health hazard during warm weather. The Plan outlines heat stress identification, treatment, prevention intervals during the work periods in order to maintain adequate body fluid levels for the field personnel. Attachment 4 presents the Cold Exposure Casualty Prevention Plan for this project.

4.1.5 Radiological Hazards

The presence of small amounts of radioactive materials at the SAEP may present a radiological hazard to field personnel during field activities. Radiological effects from chronic exposure may result in lymphoma, osteosarcoma, and cancer of the lungs. Potential routes of exposure include inhalation of or dermal contact with radioactivity contaminated dust or debris. In order to protect workers from radiological hazards, all work will cease when measurements of radioactive material exceed 0.5 mR/hr.

5.1 ENVIRONMENTAL MONITORING

During field activities at the SAEP, environmental monitoring will be performed by the SSHO and other appropriately trained W-C personnel and recorded on forms in the Daily Health and Safety Reports. Several instruments, as discussed below, will be utilized to monitor the environment in the work zones.

5.1.1 Organic Vapor Monitoring

An organic vapor monitor will be used to detect concentrations of certain vapors in the air. Specifically, an HNu Model PI 101 photoionization detector (HNu PID) or similar model with an 10.2 eV probe or OVA flame ionization detector (OVA FID) will be used to monitor organic vapors. Readings will be taken in the employee breathing zone during all work activities. It should be kept in mind that the organic vapor monitor detects mixtures of compounds simultaneously and readings do not indicate concentrations of any individual compound when a mixture of compounds are present.

Organic vapors will be monitored a minimum of every 15 minutes in the breathing zone of workers deemed to be subjected to the greatest exposure.

If more than one work zone is active at the same time, additional air quality monitoring will be performed by qualified personnel assigned to each operation.

Air purifying respirators are not effective in environments containing vinyl chloride, methylene chloride, and chloroform. These compounds exhibit poor absorption qualities or poor warning properties. It will be necessary to monitor the concentrations of these chemicals individually. Draeger colorimetric tubes will be used to analyze the presence of these chemicals as well as for benzene, during periods of HNu PID or OVA FID readings above 5 ppm.

5.1.2 Combustible Gas Monitoring

A Combustible Gas Indicator (CGI) will be used to monitor the release of explosive gases and vapors. A Neotronics Mini Gas Monitor, or similar instrument, will be used.

5.1.3 Airborne Dust Monitoring

Because there is concern for contaminated dusts being generated by vehicular travel on the access roads and other areas within the SAEP, work areas will be initially monitored for total airborne dusts with a MIE, Inc. MINIRAM PDM-3.

5.1.4 Noise Level Monitoring

Work activities at SAEP will be conducted at locations with high noise levels from the operations of heavy equipment. In accordance with OSHA Regulations 29 CFR 1910.95, hearing protection will be used when noise levels exceed 80 dBA average over an 8-hr day; hearing protection is required to be worn for exposures greater than 100 dBA for any length of time. In the absence of instrumentation, an appropriate rule of thumb is that when normal

conversation is difficult or a distance of 2 to 3 ft, hearing protection is required. Noise levels will be monitored on an "as needed basis" to provide information relative to compliance with OSHA Regulations 29 CFR 1910.95 using a CEL-393 Precision Computing Sound Level Meter and Frequency Analyzer, manufactured by Lucas CEL Instruments.

5.1.5 Radiological Monitoring

Due to the presence of low level radioactive material at the SAEP, a radiation monitor, such as a Victorian Model 190, will be used to monitor Alpa, Beta, Gamma and X-Ray emissions. If levels of radioactive emissions exceed 0.5 mR/hr, all field activities will cease and mitigative measures will be taken.

5.1.6 Instrument Calibration

The OVA FID, HNu PID and CGI monitors will be calibrated twice daily (before the start of any activities and at the end of the work day) in accordance with the manufacturers' specifications for calibration. Calibration procedures are described in Attachment 5. Daily instrument calibrations will be documented in an instrument calibration log book which will be kept at the SAEP. The MINIRAM and the radiation monitor will be calibrated in accordance with manufacturer's instructions. All equipment calibrations will be performed by the SSHO and other appropriately trained W-C personnel.

5.2 PERIMETER MONITORING

The SSHO and/or other appropriately trained W-C personnel will conduct periodic perimeter air monitoring at locations 20 ft downwind of any work area or in any area accessible to non-project personnel (whichever is closer) if air quality measurements in the breathing zone of workers in the Exclusion Zone exceed 50% of the maximum levels permissible under Level D PPE. The purpose of this perimeter monitoring is to document that personnel in the Support Zone, off-site populations, and the environment are not adversely exposed as a result of field activities. If the perimeter monitoring reveals sustained levels greater than 25% of the Level D action levels, work will be stopped in the work area causing these elevated readings and corrective measures will be implemented on-site. The location and type of monitoring will be determined in the field by the SSHO based on the nature of the work being performed on-site, the results of the air quality monitoring program, and the type of exposure being experienced at the perimeter of the work area. Meteorological monitoring shall be performed on-site as needed and used as an adjunct in determining perimeter and any off-site monitoring or air sampling locations.

5.3 HAZARD MITIGATION

5.3.1 Mitigation of Organic Vapors

Any wash water used in drilling and purge water will be collected into chemical resistant containers that can be readily sealed for future disposal and/or treatment upon proper chemical and physical classification.

Engineering controls, such as the use of vapor suppressant foams, wetting of the ground surface and plastic sheeting, will be used to reduce the volatilization of organic vapors.

5.3.2 Mitigation of Airborne Dust

Water mists and sprays may be used during ground disrupting activities to reduce the emission of any contaminated fugitive dust. They may be applied by using portable pump sprayers as the ones used for the application of herbicides and pesticides with a liquid capacity of 3 gallons.

5.3.3 Mitigation of Noise

Hearing protection, such as foam earplugs or earmuffs, will be worn when noise levels maintain an intensity of over 85 dBA.

The action levels presented herein are based on the chemicals of concern (Table 4-1), their respective exposure limits (OSHA PELs and ACGIH TLVs), and the relative response of the instruments to the contaminants. The PELs for the compounds with the highest concentrations (chlorinated solvents and aromatics) are in the range of 50 to 350 ppm. However, some contaminants found at the SAEP at lower concentrations have PELs of 1 ppm.

The selected action level of 5 ppm for a 1 minute average sustained reading is chosen because the estimate is that no more than 20% of the 5 ppm is from any constituent with published exposure levels of 1 ppm. It is expected that the highest airborne concentrations will be tetrachloroethene and 1,1,1-trichloroethane, which have PELs of 25 ppm and 350 ppm, respectively, with 1,1,1-trichloroethane expected in higher concentrations than tetrachloroethene.

ACTION LEVELS WILL BE A MAXIMUM OF ONE-HALF OF THE OSHA PELS AND/OR ACGIH TLVS. IN THE EVENT THAT OSHA PELs DIFFER FROM ACGIH TLVS, THE MORE RESTRICTIVE SHALL PREVAIL.

In the event that work must be stopped, personnel will vacate the work area and proceed to a predetermined location, as selected by the SSHO. This location will be chosen and discussed each morning, and will not have concentrations of airborne contaminants above the SAEP background levels. The maximum working levels (with appropriate PPE) are 50 ppm for total volatile organic compounds and 20 percent LEL for combustible gases and 10 percent if airflow is restricted in the work area (i.e., confined spaces, underground installations, etc.). If either of these levels are measured, the work area will be vacated, allowed to vent, and be monitored for organic compounds and combustible gases every 15 minutes by the SSHO.

The following action levels will be used for sampling activities conducted at the SAEP.

6.1 SOIL BORING, SAMPLING AND MONITORING WELL INSTALLATION

Total VOCs	Level of Protection
Background level to 5 ppm	Level D
5 ppm to 50 ppm	Level C
>50 ppm	Evacuate work area and allow area to ventilate. Return only after total VOC levels are less than 50 ppm
Benzene	**Level of Protection**
< 0.5 ppm	Level D
0.5 ppm to 10 ppm	Level C
>10 ppm	Evacuate work area and allow area to ventilate. Return only after benzene levels are less than 10 ppm.
Combustible Gases	**Action**
< 20 Percent LEL < 10 Percent LEL for confined spaces	Perform work
> 20 Percent LEL > 10 Percent LEL for confined spaces	Stop work, remove ignition sources, evacuate work area and allow area to ventilate. Return only after gases return to less than 20 percent LEL or less than 10 percent LEL in confined spaces

6.2 DRILLING THROUGH PAVED AREAS AND EXCAVATING

Total Dust Concentration	Level of Protection
< 5 mg/m3	Level D
5 mg/m3 to 10 mg/m3	Level C
> 10 mg/m3	Stop work, evacuate work area, return only after dust concentrations return to less than 10 mg/m3

W-C's health and safety responsibilities lie in a chain of command headed by the Corporate Health and Safety Manager (CHSM) and the Regional Health and Safety Manager (RHSM). Consultation, internal review, and approval of SSHPs are provided by the CHSM, RHSM and the New York Metro Health and Safety Manager (New York Metro HSM). The New York Metro HSM assists the Project Manager in matters of health and safety but does not have everyday on-site responsibilities. Site safety is maintained in the field by the Site Safety and Health Officer (SSHO). The SSHO reports to the Project Manager. The Project Manager coordinates all operations and reports to the Program Director.

7.1 PROJECT MANAGER: MICHAEL AKERBERGS

The Project Manager has the following responsibilities:

- To see that the project is performed in a manner consistent with W-C's Health and Safety Program
- To have a SSHP prepared and approved
- To provide the New York Metro BUHSM with project information related to health and safety matters and development of the SSHP
- To implement the SSHP
- To monitor the compliance with the SSHP by W-C personnel

The Project Manager has the authority to take the following actions:

- To determine personnel assignments on this project
- To temporarily suspend field activities if the health and safety of personnel are endangered, pending further consideration by the New York Metro BUHSM.
- To temporarily suspend an individual from field activities for infractions of the SSHP pending further consideration by the New York Metro BUHSM.

7.2 REGIONAL HEALTH AND SAFETY MANAGER: RODNEY PETRI, CSP

The Regional Health and Safety Manager has the following responsibilities:

- To develop, implement and oversee W-C's Health and Safety Program and provide recommendations for improvement of the program
- To coordinate health and safety activities of the business units
- To develop, implement and oversee SSHPs
- To investigate reports of incidents or accidents
- To determine whether an accidental exposure or injury merits a change in the affected individual's work assignments and whether changes in work practices are required.
- To perform site audits.

The RHSM has the authority to take the following actions:

- To approve or disapprove SSHPs
- To access project files
- To direct changes in personnel work practices to improve health and safety of employees involved in hazardous waste management projects
- To remove individuals from projects, if their conduct jeopardizes their health and safety or that of co-workers
- To suspend work on any project which jeopardizes the health and safety of personnel involved.

7.3 NEW YORK METRO BUSINESS UNIT HEALTH AND MANAGER: BENJAMIN BERTOLOTTI

The New York Metro Business Unit Health and Safety Manager has the following responsibilities:

- To interface with the Project Manager in matters of health and safety
- To develop a SSHP for the project and to submit it to the CHSM for approval
- To monitor compliance with the approved SSHP
- To assist the Project Manager in seeing that proper health and safety equipment is available for the project
- To approve personnel to work on this site with regard to medical examination and health and safety training
- To report safety-related incidents or accidents to the CHSM
- The New York Metro BUHSM will not have everyday on-site responsibilities

The New York Metro BUHSM has the authority to take the following actions:

- To suspend work or otherwise limit exposures to personnel if the SSHP appears to be unsuitable or inadequate.
- To direct workers to change work practices if they are deemed to be hazardous to the health and safety of personnel.
- To remove personnel from the project if their actions or conditions endanger their health and safety or the health and safety of co-workers.

7.4 SITE SAFETY AND HEALTH OFFICER: ROBERT WOLFF

The Site Safety and Health Officer has the following responsibilities:

- To implement and continually enforce W-C's Health and Safety Program
- To report safety-related incidents or accidents to the Project Manager and New York Metro BUHSM

- To implement and continually enforce the SSHP
- To maintain health and safety equipment on-site, as specified in the SSHP
- To inspect health and safety activities on-site, as specified in the SSHP, and report results to the Project Manager and the New York Metro BUHSM

The SSHO has the authority to take the following actions:

- To temporarily suspend field activities, if health and safety of personnel are endangered, pending further consideration by the New York Metro BUHSM.
- To temporarily suspend an individual from field activities for infractions of the SSHP, pending further consideration by the New York Metro BUHSM.
- To designate an alternate SSHO in his absence.

7.5 ALTERNATE SITE SAFETY AND HEALTH OFFICER:

The Alternate Site Safety Officer assumes the responsibilities and authorities of the SSHO in the absence of the assigned SSHO.

This section describes the anticipated personal protective equipment levels for site acitivities. The initial level of protection assigned to each work task, except where noted below, covered by this SSHP is Level D. Level D represents W-C's best estimate of the PPE necessary to reduce the potential for exposure of field personnel to potential hazards to acceptable levels. This level of protection may be upgraded based on visual observations or the results of air monitoring.

8.1 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment specified in this SSHP will be provided for all field personnel. The following requirements are in accordance with OSHA regulations:

- Facial hair that interferes with proper fit of respirators must not be worn
- Contact lenses must not be worn
- Eyeglasses that interfere with proper fit to full-face respirators must not be worn

The following descriptions of personal protective equipment ensembles shall constitute the cited Levels of Protection as used in this SSHP for the sampling activities at the SAEP:

8.1.1 Level D Personal Protective Equipment

- Hard hat
- Safety glasses, goggles, or face shield(1)
- Steel-toed and steel shank work boots
- Overboots or disposable "booties"(2)
- Outer gloves(3)
- Latex surgical gloves (to be worn underneath outer gloves)(2)
- Gray or dark blue Tyvek coveralls(4)

(1) if splash or dust hazard exists

(2) personnel should wear neoprene overboots or "booties" in Areas containing PCBs; rubber overboots or "booties" may be worn, as required, in other areas of the facility.

(3) personnel should wear neoprene outer gloves in Areas identified as containing PCBs; nitrile rubber outer gloves may be worn, as required, in other areas of the facility.

(4) polycoated Tyvek or Saranex impregnated coveralls should be worn in areas identified as containing PCBs.

8.1.2 Level C Personal Protective Equipment

- Hard hat
- Full-face air purifying respirator with GMC-H combination cartridges
- Chemical-resistant steel-toed and steel shank work boots

- Nitrile rubber outer gloves or a material compatible with the suspected chemicals
- Latex surgical gloves (to be worn underneath outer gloves)
- Rubber overboots or disposable "booties" (dark color preferred)
- Gray or dark blue hooded Saranex impregnated or polycoated Tyvek coveralls (taped at cuffs)

8.1.3 Level B Personal Protective Equipment

- Positive pressure-demand full-facepiece self-contained breathing apparatus (SCBA), or positive pressure-demand supplied air respirator with a 15 minute escape SCBA
- Gray or dark blue hooded Saranex impregnated or polycoated Tyvek coveralls (taped at cuffs, seams and facepiece)
- Nitrile rubber outer gloves or a material compatible with the expected chemicals
- Latex surgical gloves (to be worn underneath outer gloves)
- Chemical-resistant steel-toed and steel shank work boots
- Rubber overboots or disposable "booties" (dark color preferred)

In addition to this equipment, a first aid kit, snakebite kit, and emergency eyewash in accordance with ANSI Z-358.1, is maintained in the W-C Site Trailer. Multi-purpose dry chemical UL Class A-B-C fire extinguishers are maintained in the W-C Site Trailer, at each drilling site, and in the sampling boat.

The anticipated levels of protection for the planned field activities at the Stratford Army Engine Plant (SAEP) are documented in Table 8-1. A list of required personal protective equipment is provided in Attachment 6.

9.1 MEDICAL EXAMINATION

Before entering any Contamination Reduction Zone (CRZ) or Exclusion Zone all W-C and subcontractor personnel and visitors (i.e., non-project personnel) must take a medical examination as part of a medical surveillance program. W-C's medical surveillance program is specified in W-C's Hazardous Waste Management Practice Health and Safety Manual, and meets the requirements of OSHA Regulations 29 CFR 1910.120(f) and ANSI Z-88.2. A description of this program is provided in Attachment 7 of this SSHP.

Before working on-site, written certification for each W-C and subcontractor employee expected to enter either the CRZ or Exclusion Zone of participation in a Medical Surveillance Program, ability to wear a respirator and the date of last medical examination will be compiled and kept on site by the SSHO.

9.2 TRAINING

All W-C personnel and subcontractor exposed to hazardous substances, health hazards or safety hazards must be thoroughly trained as specified in OSHA Regulations 29 CFR 1910.120(e). Training includes attendance at an initial 40-hr basic health and safety training course, annual health and safety refresher courses, a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor, and on-site, site-specific training. On-site supervisors must have completed the Management and Supervisor Training course as specified in OSHA Regulations 29 CFR 1910.120(e)(4). At least one First Aid and CPR trained person must be present on-site at all times when fieldwork is being performed. In addition, these individuals shall be trained and thoroughly familiar with bloodborne pathogens, hazard control and isolation during first aid cases, as documented in 29 CFR 1910.1030. Documentation concerning the type, duration and dates of training, including fit-test certificates, for all W-C and subcontractor on-site personnel and visitors will be provided and kept at the site by the SSHO. The SSHO shall conduct site-specific training covering site hazards, procedures, and all contents of the SSHP for W-C and subcontractor on-site personnel and visitors to the site prior to entering any CRZ or Exclusion Zone. Documentation of appropriate training for all W-C and subcontractor site personnel and site visitors shall be maintained on-site.

9.3 INCIDENT REPORTING

Any incident or accident involving W-C field personnel or W-C subcontractors will require that a Hazardous Waste Incident Report be filed. Situations covered by this policy include, but are not limited to, fires, explosions, illnesses injuries, and automobile accidents. Those reports must be sent to the New York Metro BUHSM within 24-hours of the incident/accident. Worker's Compensation Insurance reports should be filed with the individual's employer within 48-hours of each accident or illness which results from work related activities and requires medical attention. See Attachment 8 for a copy of the Hazardous Waste Incident Report Form. The SSHO will complete this form in case of an accident or incident.

All other personal injuries requiring first aid or resulting in lost time must be recorded on OSHA Form 200. OSHA does not require this to be sent in, but W-C is required to keep this Form for the purpose of inspections by OSHA.

Accidents will be investigated in-depth to identify all causes and to recommend hazardous control measures. Except for rescue and emergency measures, the accident scene shall not be disturbed until it has been released by the investigating official. The consequences requiring an in-depth investigation are:

- Fatal Injury
- Five or more persons admitted to a hospital
- Property damage in an amount specified by the designated authority

The Project Manager must be notified as soon as possible of all accidents or incidents which require an OSHA Form 200 to be completed.

9.4 ILLUMINATION AND SANITATION

If practical, all major work tasks will occur during daylight hours. The illumination requirements set forth in OSHA Regulation 29 CFR 1910.120(m) will be met when these tasks are performed. Needs for artificial illumination are primarily expected to be limited to work inside buildings. An electric lamp will be used in these areas. In compliance with OSHA Regulation 29 CFR 1926.56, the minimum intensity of lighting in work areas will be 5 foot candles.

The sanitation requirements regarding potable and non-potable waters, toilet facilities and washing facilities will be followed as set forth in OSHA Regulation 29 CFR 1910.120(n). Food handling areas and temporary sleeping quarters requirements are not applicable to the work covered by this SSHP.

9.5 COMPLIANCE AGREEMENT

The Site Manager and/or the SSHO will hold meetings with W-C and subcontractor field personnel before work commences. During the meetings, all personnel will be provided with a copy of this SSHP; the SSHP will be reviewed and discussed and questions answered; fit testing and care of respirators will be reviewed. Signed Compliance Agreement Forms will be collected by the Site Manager and filed. Individuals refusing to sign the Compliance Agreement will not be allowed to work at the SAEP. A copy of the Compliance Agreement Form is contained in Attachment 9.

9.6 RESPIRATOR MAINTENANCE

Each person is responsible for their own respirator. Respirators, if used, will be cleaned daily according to procedures prescribed by the manufacturer. GMC-H combination cartridges will be used and replaced either daily or if breakthrough is detected at any time while is use. Reuse of cartridges from one day to another is prohibited; care will be taken to ensure that cartridges are not damaged or exposed to chemicals which might affect their efficiency when masks are stored

during the work day (eg., during lunch). Cartridges will be stored in their original manufacturer's boxes (sealed individually in factory plastic bags) in a secure area of the project trailer. Use of other cartridges must be approved by the New York Metro BUHSM. The following checks will be performed on a daily basis on each individual respirator in use:

- Exhalation valve - pull off plastic cover and check valve for debris or tears in the neoprene valve which could cause leakage.
- Inhalation valves (two) - screw off cartridges and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.
- Make sure a protective lens cover is attached to the lens. Lenses are expensive to replace and must be protected at all times.
- Make sure you have the right cartridge (use GMC-H).
- Make sure that the face piece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.
- Make sure the speaking diaphragm retainer ring is hand tight.

Additional information on respirator inspection, care, maintenance and storage is provided in Attachment 10.

9.7 PROJECT MANAGER NOTIFICATION

All field personnel must inform the Project Manager or designated representative before entering the SAEP.

IF ANY UNEXPECTED POTENTIAL HAZARDS ARE DISCOVERED DURING FIELD WORK, LEAVE THE AREA OF CONCERN IMMEDIATELY AND CALL THE SITE SAFETY AND HEALTH OFFICER FOR FURTHER INSTRUCTIONS.

Field activities in such areas shall be halted until the SSHP has been modified to reflect these changed conditions and reviewed/approved by the New York Metro BUHSM.

9.8 DAILY HEALTH AND SAFETY SUMMARY REPORT

A Daily Health and Safety Summary Report will be used to record entry and exit times of all W-C and subcontractor personnel and work area visitors; accidents, injuries, and illnesses; incidences of safety infractions by field personnel; air quality and personal exposure monitoring data; and other information related to safety matters. Daily health and safety inspections shall be conducted by the SSHO to determine if operations are being performed in accordance with the SSHP; results of these inspections will be documented in the Daily Health and Safety Summary Report. All accidents, illnesses, or other incidents will be reported to the Project Manager and the New York Metro BUHSM. A copy of the form for the Daily Health and Safety Summary

Report for this project is presented in Attachment 11. The Daily Health and Safety Summary Reports, including personnel/visitor logs and results of environmental and personal exposure monitoring/sampling shall be completed and maintained on-site by the SSHO and submitted to the Contracting Officer's Representative at the conclusion of the site work.

9.9 OSHA JOB SAFETY AND HEALTH PROTECTION POSTER

In accordance with the Occupation Safety and Health Act of 1970, a copy of the OSHA Job Safety and Health Protection poster must be present on all sites. This poster is appended as Attachment 12. It should be posted at its full size (11 inches x 17 inches) on-site.

9.10 PROHIBITIONS

- Smoking, eating, drinking, chewing tobacco or toothpicks, application of cosmetics, storing food or food containers, or having open fires will not be permitted in the Exclusion Zone and the Contamination Reduction Zone and any manufacturing and/or storage areas. Good personal hygiene will be practiced by field personnel to avoid ingestion of contaminants. Washing the face and hands will be performed after personal decontamination.
- Approach or entry into areas or confined spaces where toxic or explosive concentrations of gases or dusts may exist is prohibited.

9.11 WORK PROCEDURES

Whenever possible, field personnel will work from a position upwind of work activities.

All operations conducted on the intertidal flats including collection of surface water and sediment samples, must be performed with a dedicated "watcher" on-shore. If working from a boat, all personnel on the boat must wear U.S. Coast Guard approved flotation jackets while on the boat and suitable slip resistant footwear.

9.12 UNDERGROUND STRUCTURES

Extreme caution will be exercised whenever possibility of encountering buried utilities, (i.e., tanks) exists. Prior to commencement of intrusive activities, all available sources of information such as site utility drawings, public utility drawings, and construction drawings will be reviewed. If underground obstructions are unexpectedly encountered, the area will be manually excavated until the nature of the obstruction is discerned.

9.13 SITE SAFETY MEETINGS

During field operations, an initial size orientation meeting and daily safety meetings will be held by the SSHO to review and plan specific health and safety aspects of scheduled work. Potential subjects to be discussed are presented here:

9.13.1 Preliminary

- Medical clearances for all on-site personnel
- Written SSHP availability (copies provided to all participants)
- Personal protective equipment availability, demonstration and fit testing (if necessary)
- General construction protocols.

9.13.2 Training Topics

- Delineation of responsibilities of on-site personnel.
- Review of SSHP including:
  - types of hazards;
  - pathways of exposure;
  - levels of protection;
  - contamination avoidance;
  - physical hazards;
  - decontamination;
  - emergency procedures; and,
  - specific on-site area/work tasks of concern
- Decontamination review including:
  - delineation of work zones; and
  - set-up and dry run of decontamination equipment.
- Personnel protective clothing - use and dress out procedures
- Monitoring equipment review
- Questions and answers
- Completion of SSHP Compliance Agreement

9.14 WORK ZONES

To minimize the movement of contaminants from contaminated areas of the SAEP to uncontaminated areas, work zones will be set up. The work zones will include, at a minimum, the following:

Zone 1:	Exclusion Zone
Zone 2:	Contamination Reduction Zone
Zone 3:	Support Zone

The Exclusion Zone is the zone where contamination does or could occur. All persons entering this zone must wear the Level of Protection set forth in Section 8. These levels of protection guidelines are based on the different types of field activities.

Because work at several areas may be performed concurrently, an Exclusion Zone and Contamination Reduction Zone will be established at each area of work. These Contamination Reduction Zones will be in addition to the Contamination Reduction Zone located near the support trailers. All personnel must decontaminate after leaving Exclusion Zones.

All work zone entrances and exits will be clearly marked or displayed in accordance with the SAEP Requirements and Standard Operating Procedures. Yellow and black striped caution tape will be used to demark the zones. Exclusion Zones will be established using the back of the drilling rig as the center of the zone by delineating a circle (see Figure 9-1). The radius can vary, depending on wind direction and speed, physical obstructions, and the minimum space requirements for safe and effective work. Typically the minimum radius is 25 feet. Monitoring equipment will be used to aid in delineating these zones. A wind direction indicator (i.e. wind sock) will be deployed at each work site.

9.15 WORKING FROM BOATS OR NEAR WATER

The following precautions should be taken when working from boats or near water:

- All work in a boat or near the water shall be performed by at least a two-person team. Type III, Type V or better U.S. Coast Guard approval personal flotation devices shall be worn at all times.
- If the work requires reaching, stretching, etc., from the boat or bank, the worker shall be equipped with a harness and lifeline. The lifeline shall be attached to the boat (if boat work) or a sturdy object on the bank (if bank work).
- The sampling area of the boat shall be lined with plastic to reduce contamination of the boat.

Additional information on over water hazards is presented in Attachment 13.

10.1 SITE ACCESS

Access to the SAEP will be limited to authorized personnel. Such personnel may include W-C employees, subcontractors, and designated client, state and federal agencies.

10.2 SITE CONTROL

Certain procedures must be followed to ensure suitable site control and limitation of access so that those persons who may be unaware of site conditions are not exposed to inherent hazards.

All machinery and equipment shall be stored in an on-site area designated by the SSHO. All potentially contaminated materials, such as bottles, containers and soil will be stored in an on-site area to prevent unauthorized tampering.

Anyone from the general public requesting information about site activities should be referred to the Site Manager. Do not give your opinion or information to anyone asking questions about this project.

Communications will be maintained at the SAEP with two-way radios operating on a designated channel whenever work groups are not within a reasonable proximity of each other. The buddy system will be used when working in any Exclusion Zone.

10.3 SITE SECURITY

Areas within the SAEP will be provided for the office trailers, parking of drilling equipment and storage of supplies. These areas are surrounded by a chain link fence. Access to these areas is controlled by security guards 24 hours per day.

Controlled access to the site will be established. This controlled access will be through the main access road and the SAEP gates.

Only authorized personnel shall be permitted to enter the SAEP. No one shall enter the SAEP without appropriate authorization from SAEP's security personnel. All individuals entering the site will sign the daily log and be given SAEP identification (visitors) badges.

All persons entering the sampling areas at the SAEP shall be equipped with appropriate personal protective equipment. Documentation of ability to work on hazardous waste sites, wear respiratory protection, and training must be provided to the SSHO.

All persons entering the sampling areas at the site must be familiar with and abide by the SSHP.

11.1 GENERAL INFORMATION

Personnel involved with hazardous substances may be exposed to contaminants in a number of ways, despite the most stringent protective procedures. Personnel may come in contact with vapors, gases, mists, or particulates in the air. Use of monitoring instruments and construction equipment can also result in exposure to hazardous substances. This contamination must be removed before leaving any contaminated area.

In general, decontamination involves scrubbing or spraying with a non-phosphate soap/water solution followed by clean water rinses. All disposable items will be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies, are difficult to decontaminate. These components can be soaked in soap and water and scrubbed with a brush. In addition to being decontaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized before they can be used again. The manufacturer's instructions should be followed in sanitizing the respirators. The SSHO will be responsible for ensuring that personal protective equipment is used properly.

11.2 DECONTAMINATION AREA

A decontamination pad will be set up near the support trailers. This pad will be for decontaminating heavy equipment leaving the SAEP. A high-pressure hot water "steam-type" cleaner for cleaning tires and undercarriages of drilling rigs and other vehicles and down-hole equipment will be kept on-site.

Each work zone will also have decontamination facilities. Personal decontamination equipment will be near each work zone. All field personnel will thoroughly decontaminate before leaving the Contamination Reduction Zone and entering the Support Zone.

Decontamination water will be allowed to evaporate. All decontamination water remaining at the end of the field effort will be collected in drums for analysis and appropriate disposal. All used disposable PPE will be placed in heavy gauge plastic bags for proper disposal.

11.3 PERSONAL DECONTAMINATION PROCEDURES

The following steps must be taken for personnel decontamination when leaving Exclusion Zones (subject to modification by SSHO) for PPE Levels C and D:

- Deposit equipment that needs to be decontaminated on plastic drop cloths.
- Wash boots and outer gloves with long handled brushes in wash tub containing detergent and water.
- Rinse boots and outer gloves with long handled brush in a wash tub containing clean water or use a sprayer to rinse off boots and gloves.
- Rinse suit with portable spray bottle if it is water resistant
- Remove tape and place in plastic bag
- Remove outer gloves and place in plastic bag

- Remove coveralls and place in plastic bag
- When applicable, remove air purifying respirator, SCBA or positive pressure-demand supplied air respirator and place in a separate area to be decontaminated[1].
- Remove inner gloves and place in plastic bag
- Wash hands and face

Decontamination procedures to be used in case of an emergency are described in Section 12.

11.4 EQUIPMENT DECONTAMINATION PROCEDURES

11.4.1 Small Sampling Equipment Decontamination

The following steps must be taken for decontaminating small sampling equipment when removing such equipment from the Exclusion Zone (subject to modification by the SSHO):

- After use, small equipment such as that associated with sampling (split tube samplers, trowels, shovels, picks, chisels, hammers, other specific samplers, etc.) will be transported from the Exclusion Zone to the decontamination pad in the adjacent Contamination Reduction Zone.
- Equipment will first be washed with a hot water high-pressure hot water "steam-type" cleaner.
- Equipment will then be scrubbed down with soapy water using brushes and a phosphate-free soap.
- Equipment will then be rinsed, by hose, with water.
- Equipment will then be placed on the plastic sheet covered area on the decontamination pad to air dry.

11.4.2 Large Sampling Equipment Decontamination

The following steps must be taken for decontaminating large sampling equipment when such equipment leaves the Exclusion Zone (subject to modification by the SSHO):

- Large sampling equipment such as drill rigs, hollow-stem augers, etc., shall be driven or carted from the Exclusion Zone to the decontamination pad.
- Equipment will first be washed with a high-pressure hot water "steam-type" cleaner.
- Equipment will then be scrubbed down with soapy water using brushes and a phosphate-free soap.
- Equipment will then be rinsed, by hose, with water.
- Equipment will then be placed on the plastic sheet covered area on the decontamination pad to air dry.

11.4.3 Respirator Care, Maintenance and Storage

Respirator care, maintenance and storage are discussed in Attachment 12.

The purpose of this section of the SSHP is to address how personnel will respond to emergencies. The types of potential emergencies that are addressed by this plan include:

- Fire;
- Chemical exposures to personnel; and,
- Physical injuries to personnel.

After any emergency, the SSHO shall document in a detailed emergency summary report the nature of the emergency, causes for occurrence, chemical exposures or physical injuries to personnel, physical damage, and emergency responses taken. This report shall be in addition to the Health and Safety Incident Report. Copies of this report must be submitted to the Project Manager, the Field Supervisor, and the BUHSM within 24 hours of the emergency. The BUHSM will review this report as soon as possible and issue a critique of the response to the emergency within 48 hours of receiving the report; this critique will be distributed to all personnel receiving copies of the emergency summary report. If this critique indicates that additional emergency response equipment, training, personnel, or response procedures are required at the Site, these actions will be implemented as soon as possible.

12.1 EMERGENCY RECOGNITION AND PREVENTION

Fires are possible whenever flammable gases or vapors are present in proper concentrations and an ignition source is present. The construction equipment itself provides an ignition source. To prevent fires, a CGI will be used at the discretion of the SSHO to detect flammable concentrations of gases or vapors. Ignition sources (including construction equipment) will be turned off and the area evacuated if vapors or gases reach 20 percent of the LEL. Work will not resume until the SSHO observes CGI flammable gas concentrations continuously below 20 percent of the LEL for 15 minutes or more.

12.1.1 Chemical Exposures

Work will be performed in such a manner that exposure to contaminants through skin or eye contact, inhalation, or ingestion is minimized. Work practices that will be followed to reduce chemical exposures include:

- PPE, as specified in Section 8.0, for the appropriate work activities and areas as defined by the SSHO, will be used by all W-C and Contractor personnel. A formal revision to the SSHP must be made by the BUHSM in order to modify the PPE requirements.
- Keep hands away from face during work activities.
- Minimize all skin and eye contact with contaminants.

Early recognition of chemical exposure symptoms is essential to the prevention of serious chemical exposure incidents. Symptoms of exposure to the type of compounds potentially present at the Site include the following: fatigue, weakness; eye, nose, throat irritation; headache; dizziness; nausea; vomiting; malaise; tremors; aggressive confusion; cyanosis (blue color to skin); anemia; and muscle spasms.

If a person experiences any of these symptoms, or others, or recognizes any of the symptoms in a fellow worker, the person experiencing the symptoms will stop work and report his or her symptoms to the SSHO. If the symptoms persist or appear to be damaging in any way, the SSHO will make arrangements to take the individual to a hospital for medical treatment. If symptoms are serious, work activities in the area where the person was exposed will be discontinued until more is known about the incident. Incident reporting procedures as specified in Section 9.3 will be initiated.

12.1.2 Physical Injury

Personnel should constantly look for potential safety hazards such as holes or ditches; precariously positioned objects, such as drums or equipment that may fall; sharp objects, such as nails, metal shards, and broken glass; protruding objects at eye or head level; slippery surfaces; steep grades; uneven terrain or unstable surfaces, such as walls that may cave in or flooring that may give way. Personnel will inform the SSHO of any potential hazards identified so that corrective mitigative action can be taken.

12.2 EMERGENCY ALERTING PROCEDURES

The SSHO will use a portable radio or direct contact to alert the appropriate work groups when and if an emergency occurs. The SSHO and any isolated work group will carry two-way radios if reasonable contact cannot be maintained. If radios fail, blast(s) from an alarm horn will be used to signal workers. The following signals will be used:

one long blast	evacuate area
two short blasts	localized problem (no danger to workers)
two long blasts	all clear
three short blasts	medical emergency

12.3 SITE SECURITY, SITE CONTROL, AND SITE EVACUATION PROCEDURES

In emergency situations, the following actions will be enforced:

- All personnel will meet at a location upwind from the emergency. This area will be designated daily by the SSHO at the Site Safety Briefing.
- Security and control of the project area will be the responsibility of the SSHO. The SSHO will coordinate the emergency situation with appropriate personnel and emergency responders: (e.g., fire department, ambulance squad, haz-mat responders, etc.).
- Site security personnel will not permit any additional personnel (with the exception of emergency response personnel) from entering the Site.

- If an emergency occurs in the Exclusion Zone, personnel in the Exclusion Zone will proceed immediately to the Contamination Reduction Zone to decontaminate, then proceed to an upwind location. If this is not possible, personnel will leave the area of the emergency as soon as possible by the nearest point of egress from the Exclusion Zone, remove contaminated protective clothing, contain this protective clothing as well as possible to mitigate spread of contaminants, and proceed to an upwind location.
- The SSHO will communicate with Contractor supervisors during emergencies. Supervisors will then relay information to their employees. Portable radios, if available, or audio and/or visual signals will be used to communicate the nature of the emergency and response actions.

12.4 EMERGENCY TELEPHONE NUMBERS

Emergency telephone numbers are given below and are repeated in Attachment 14 for posting.

EMERGENCY SERVICES

Ambulance	911
Fire Department	(203) 385-4073
Police Department	(203) 385-4100
Bridgeport Hospital	(203) 384-3000
Poison Control Center	(800) 962-1253
USEPA National Response Center	(800) 438-2427
U.S. Coast Guard/USFPA National Response Center	(800) 424-8802

THESE EMERGENCY TELEPHONE NUMBERS WILL BE VERIFIED BY THE W-C FIELD SUPERVISOR PRIOR TO THE INITIATION OF FIELDWORK.

12.5 EMERGENCY RESPONSE PROCEDURES

12.5.1 Emergency Response Personnel

The SSHO will have the primary role in responding to all emergencies in the project area. All personnel working in the project area will contact the SSHO in case of emergency. The SSHO, or designee, must be present in the project area during all work activities. If reasonable contact cannot be maintained, the SSHO will carry a two-way portable radio and each isolated activity group will also have a two-way portable radio. If any emergency such as a fire, chemical exposure, or physical injury occurs, the SSHO will be immediately contacted. The SSHO, or designee performing in this capacity, will be trained in CPR/First Aid. In cases of emergency

response, all field personnel will take direction from the SSHO. If the SSHO or designee is not present, the Field Supervisor will respond to emergencies.

12.5.2 Emergency Response Equipment

The following emergency response equipment is maintained by the SSHO:

- First Aid Kit
- First Aid Directions
- 20-lb A: B: C Fire Extinguishers
- Hand-Held Spotlight with Flood Reflector

The supplying of these emergency response equipment at the Site does not reduce the need to contact appropriate off-site emergency response agencies during emergencies at the Site.

12.6 EMERGENCY DECONTAMINATION PROCEDURES

- Decontamination of an injured or exposed worker will be performed only if decontamination does not interfere with essential treatment.
- If decontamination can be done: wash, rinse, and/or cut off protective clothing and equipment.
- If decontamination cannot be done:
  - Wrap the victim in blankets or plastic sheeting to reduce contamination of other personnel;
  - Alert emergency and medical personnel to potential contamination; and,
  - Arrange to have SSHO or other personnel familiar with the incident and contaminants at the Site accompany the victim to the hospital.

12.7 ON-SITE MEDICAL TREATMENT AND EMERGENCY FIRST AID PROCEDURES

Medical treatment and first aid may be administered by the SSHO or other personnel who have been trained in First Aid. General first aid procedures include:

- Remove the injured or exposed person(s) from immediate danger. Support head, neck, and back whenever a victim of trauma, including falls, must be moved.
- Render first aid, if necessary, and decontaminate affected personnel, if necessary.
- Call an ambulance for transport to local hospital immediately. This procedure should be followed even if there is no apparent serious injury. Emergency telephone numbers are listed in Section 12.4
- Evacuate other personnel to a safe place until the SSHO (assisted by the W-C Field Supervisor) determines that it is safe for work to resume.
- Report the accident to the W-C BUSHM and W-C Project Manager immediately.

Information on On-site Medical Treatment and Emergency First Aid Procedures is presented in Attachment 13. First aid supplies can be found in the SSHO's office.

12.8 DIRECTIONS TO BRIDGEPORT HOSPITAL FOR SAEP

1. Exit the SAEP and travel North on Main Street (SR 13).
2. Continue for approximately 0.5 miles and turn left onto South Avenue.
3. Continue to end (0.5 miles) and turn left onto Stratford Avenue.
4. Continue approximately 0.5 miles and turn right onto Bruce Avenue.
5. Continue another 0.5 miles and turn onto Barnum Avenue.
6. Continue another 0.5 miles and turn right onto Grant Avenue. The Bridgeport Hospital is on the right.

The directions to Bridgeport Hospital are repeated in Attachment 14 for posting. A map to the hospital is presented as Figure 12.-1.

THE DIRECTIONS TO THE HOSPITAL MUST BE VERIFIED BY THE FIELD SUPERVISOR AND ALL SSHO'S PRIOR TO THE INITIATION OF FIELDWORK.

13.1 PROJECT PERSONNEL

W-C personnel authorized to enter the site and work on this project subject to compliance with provisions of the SSHP are:

Project Manager	Michael Akerbergs
Site Safety and Health Officer	Robert Wolff
New York Metro Business Unit Health and Safety Officer	Benjamin Bertolotti
Corporate Health and Safety Manager	Phillip Jones, CIH
Regional Health and Safety Manager	Rodney Petri, CSP

13.2 PROJECT SAFETY PERSONNEL

Personnel responsible for implementing this SSHP are the Project Manager and the SSHO. Their specific responsibilities and authority are described in W-C's Health and Safety Manual.

Michael Akerbergs
Project Manager

8/31/98
Date

Benjamin Bertolotti
New York Metro Business Unit
Health and Safety Officer

8/31/98
Date

Rodney Petri, CSP
Regional Health and Safety Manager

8/27/98
Date