



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

October 10, 1996  
File #: 1284-0018-96-0740

Navy Environmental Health Center  
2510 Walmer Avenue  
Norfolk, VA 23513-2617  
Attn: Mary Ann Simmons

Subject: US NAVY CONTRACT NO. N62472-94-D-0398  
DELIVERY ORDER NO. 0018 - VARIOUS REMEDIAL ACTION AT NAWC  
TRANSMITTAL OF ADDENDUM NO. 2 TO HEALTH & SAFETY PLAN

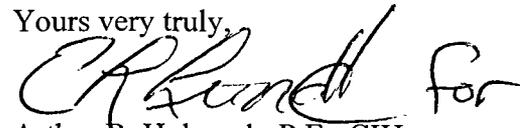
Dear Ms. Simmons:

The enclosed Draft Addendum No. 2 to the Health and Safety Plan is submitted for your review. Please provide your comments by fax to Mr. Paul Briegel, COTR, at (610) 595-0554.

In order to maintain project schedule, we request your review be completed by October 24, 1996.

Should you have questions concerning the information contained in this plan, please contact Mr. Grey Coppi at (215) 702-4079.

Yours very truly,

  
Arthur B. Holcomb, P.E., CIH  
Program Manager

ABH/pd  
Enclosure

cc: A. Aziz  
G. Coppi  
File

**SITE HEALTH AND SAFETY PLAN ADDENDUM NO. 2**

Site: **NAVAL AIR WARFARE CENTER**

Location: **WARMINSTER, PA**

Prepared By: **FOSTER WHEELER ENVIRONMENTAL CORPORATION**

Date Prepared: **OCTOBER 10, 1996**

Revision: **0**

Project Description: **REMEDIAL ACTION INVOLVING SOIL, WASTE, SLUDGE,  
REMOVAL AT SITE 6**

Delivery Order #: **0018**

Waste Types: Solids, Viscous  
Characteristics: Volatile, toxic  
Status: Active, Military  
Background Review: Complete  
Overall Hazard: Moderate

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APPROVALS

By their signature, the undersigned hereby certify that this SHSP has been reviewed and approved for use at Site 6 NAWC Warminster, PA.

\_\_\_\_\_  
DELIVERY ORDER MANAGER

\_\_\_\_\_  
DATE

\_\_\_\_\_  
PROGRAM HEALTH AND SAFETY MANAGER

\_\_\_\_\_  
DATE

\_\_\_\_\_  
SITE SUPERINTENDENT

\_\_\_\_\_  
DATE

\_\_\_\_\_  
SITE HEALTH AND SAFETY OFFICER

\_\_\_\_\_  
DATE

"I hereby certify that the (material) (equipment) (article) shown and marked in this submittal and proposed to be incorporated with Contract Number N62472-94-D-0398, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is  approved for use,  approved for use subject to Government approval of proposed variation.

Certified by Submittal Reviewer *[Signature]*, Date 10/10/96  
(Signature when applicable)

Approved by QC Manager *Robert N. Volvano for Akram Aziz*, Date 10/10/96  
(Signature)

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## 1.0 INTRODUCTION

### 1.1 Purpose

This Addendum to the original Site Health and Safety Plan (SHSP), dated May 13, 1996, addresses the health and safety practices that will be employed by all site workers participating in excavation activities at the Naval Air Warfare Center (NAWC) Warminster, PA. Addendum No. 2 only includes health and safety information relevant to Site 6 remediation activities. The original SHSP takes into account the specific hazards inherent to soil and sludge removal and presents procedures to be followed by Foster Wheeler Environmental Corporation, its subcontractors, and all other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. Activities performed under this Addendum will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926, USACOE EM 385-1-1, Navy/Marine Installation and Restoration Manual and the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Many programs from the manual are referenced in this SHSP but are not included. A copy of the manual will be maintained at the site. Modifications to the SHSP may be made with the approval of the PHSM using the Field Change Request Form found in Appendix A.

### 1.2 Scope

#### 1.2.2 Site 6

This Addendum has been developed to address health and safety concerns during excavation activities at Site 6. There are three areas which require excavation and removal of contaminated soil/debris along with one larger area in which surface debris (cement blocks, metal and brick, etc.) is to be removed.

The scope of work requires the following tasks:

#### Task 1 - Pre-Mobilization Sampling/Surveying

- Survey site layout; and
- Conduct soil sampling using split spoons in order to profile the soil/waste for direct loading (6 composite samples collected via drill rig). Borings are anticipated to be up to 10 feet deep.

#### Task 2 - Site Mobilization

- Construction of a clean gravel road to be left in place following project termination
- Installation of a temporary decontamination pad for the trucks and heavy equipment

#### Task 3 - Clearing Area for Site Access

- Remove trees blocking site access; and
- Dispose of trees.

#### Task 4 - Excavation/Confirmatory Samples/Removal of Surface Debris

- Excavate each of three hot spot areas separately;
- Collect post-excavation samples; and
- Remove surface debris.

#### Task 5 - Backfill/Topsoil

- Backfill each area following receipt of post-excavation confirmatory samples (Compaction will be performed with an excavator bucket and/or track mounted dozer); and
- Replace topsoil.

A Site Superintendent, a Site Health and Safety Officer (SHSO) and four craft personnel will be required to perform the excavation, loading and backfilling.

### **1.3 Application**

The SHSP applies to all personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- Client representatives;
- Federal, state or local representatives; and
- Foster Wheeler Environmental employees and subcontractors.

### **1.4 Summary of Major Risks**

- Exposure to contaminants;
- Operation of heavy equipment (bucket loader and excavator);
- Operation of hot pressure washer;
- Temperature extremes;
- Operation of chain saw/chipper; and
- Falling trees.

## **2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES**

The project organization duties and responsibilities will be consistent with those described in Section 2.0 of the original SHSP.

### **3.0 BACKGROUND AND SITE DESCRIPTION**

#### **3.1 Background and Site Description**

NAWC Warminster was originally the location of Brewster Aeronautical Corporation, a manufacturer of military aircraft. Since the 1940s, the main mission at the base has been research, development, testing, and evaluation for Naval aircraft systems. The base also conducts studies in anti-submarine warfare systems and software development. NAWC Warminster is scheduled for realignment under the Base Realignment and Closure Program managed by the Department of Defense. The realignment will result in relocation of NAWC Warminster activities to Naval Air Station (NAS) Patuxent River, Maryland.

To date, at least eight known locations on current NAWC Warminster property have been identified as sites used for the disposal of wastes containing hazardous substances. None of the sites is currently used for waste disposal.

##### **3.1.2 Site 6**

Site 6 is located south of the main runway and north of the facility patrol road. The site has a slight slope to the south-southeast and is covered with vegetation. The southern boundaries of the site are generally wooded and are on a steep slope. Base housing is located directly southeast of the site.

Site 6 reportedly was operated from 1960-1980. Several areas at the site reportedly received paint, solvents, demolition debris, oil, flammable material and grease trap wastes.

#### **3.2 Site Characterization Data**

##### **3.2.2 Site 6**

In April 1996, site characterization data was gathered and compared with previous data to determine the locations, nature, and extent of contamination at Site 6. This data was used in conjunction with data gathered from previous investigations and studies. A field investigation was performed as part of a Phase III Remedial Investigation (RI) activity at NAWC Warminster to better characterize the site.

Based upon field investigations performed by Haliburton NUS, there are 13 suspected disposal areas. Portions of three areas will be addressed during field activities. Three hot spot areas are to be excavated. The dimensions of the three areas are 80 feet by 40 feet at P6F, 40 feet by 20 feet at P6E and 30 feet by 30 feet at P6A. The pits vary in depth from approximately 6 to 10 feet. Also, an area approximately 1-1/2 to 2 acres is littered with surface debris and will be cleared.

Waste, consisting of concrete, charred debris, styrofoam, plastic, asphalt, scrap metal and general construction debris was found in the three pits. The surface area has exposed construction debris including pipe, bricks, cement and metal objects.

A majority of the waste contained in the Site 6 areas consist of construction debris, demolition materials, and general refuse. These wastes typically are not considered to be hazardous. However, NUS's investigation of soils, sediments, groundwater, and surface water suggest that wastes buried in the trenches may be the source of hazardous substances that have been released to the environment or could be released.

#### **4.0 POTENTIAL HAZARDS OF THE SITE**

This section presents an assessment of the chemical, physical and biological hazards that may be encountered during the tasks specified in Section 1.2. Additional information may be found in Appendix C-Activity Hazard Analyses (AHA).

#### **4.1 Properties of Chemical Contamination**

##### **4.1.1 Site 6**

The contaminants of concern in surface and subsurface soils include volatile and semi-volatile compounds such as (TCE and PAHs {benz(a)anthracene, benzo(b)fluoranthene and benzo(a)pyrene}); metals (chromium, mercury, nickel and lead)); and pesticide/PCBs (4,4-DDD, alpha chlordane and gamma chlordane, and Aroclor 1254 and 1260). Actual analytical results are included in Appendix B of this Addendum.

Table 4.2 contains a summary of the toxicological and physical properties of the chemical compounds that may be encountered during the removal activities.

Exposure to these compounds in Table 4.2 may occur through inhalation of contaminated dust particles, inhalation of volatile and semivolatiles, dermal absorption, skin contamination, or accidental ingestion of the contaminant.

The action levels for volatile and semivolatile compounds chosen were based upon the known concentration of contaminants, physical and chemical properties, toxicity, and distribution of these compounds at the sites. The predominant volatile at this site is TCE and the predominant semivolatiles are PAHs. Due to the vapor pressures of these chemicals, inhalation is the primary route of exposure. Skin absorption is also a possible route of exposure, leading to the same symptoms as inhalation overexposure. Volatile compounds are potent narcotics and may cause central nervous system (CNS) and lung damage.

TCE is a clear, colorless liquid with characteristic sweet odor of chloroform. Exposure to TCE may occur through inhalation, contact and ingestion. The acute exposure may result in headaches, vertigo, visual disturbances, tremors, nausea, vomiting, eye irritation, and dermatitis. Fatalities following severe, acute exposure have been attributed to ventricular fibrillation resulting in cardiac failure. Damage to the liver and other organs may result from chronic exposure. TCE is a suspected carcinogen.

Table 4.2 Chemical Data

| COMPOUNDS                       | CAS#       | ACGIH TLV               | OSHA PEL               | ROUTES OF EXPOSURE                               | SYMPTOMS OF EXPOSURE  | TARGET ORGANS                                     | CHEMICAL PROPERTIES   |
|---------------------------------|------------|-------------------------|------------------------|--|---|---|---|
| Aroclor 1254 (PCB)              | 11097-69-1 | .5 mg/m <sup>3</sup>    | 5 mg/m <sup>3</sup>    | Inhalation<br>Ingestion<br>Contact<br>Absorption | Irritates eyes and skin; chloracne; carcinogen  | Skin, eyes, liver, reproductive system            | Colorless to pale-yellow, viscous liquid or solid                           |
| Coal Tar Pitch Volatiles (PAHs) | 65996-93-2 | .2 mg/m <sup>3</sup>    | .1 mg/m <sup>3</sup>   | Inhalation<br>Ingestion<br>Contact               | Carcinogen, dermatitis, bronchitis  | Respiratory system, skin, bladder, kidneys        | Black or dark-brown morphous residue; properties vary depending on compound |
| TCE                             | 79-01-6    | 50 ppm                  | 50 ppm                 | Inhalation<br>Ingestion<br>Contact               | Headaches; vertigo; visual disturbance; tremors; nausea; vomiting; eye irritation; dermatitis; fatigue; giddiness; potential carcinogen | Eyes, skin, respiratory system, heart, liver, CNS | Colorless liquid; BP: 189 F; IP: 9.45 ev; UEL: 10.5%; LEL: 8%               |
| Chromium                        | 7440-47-3  | 0.5 mg/m <sup>3</sup>   | 1 mg/m <sup>3</sup>    | Inhalation<br>Ingestion<br>Contact               | Irritation to eyes, skin, lung fibrosis. May be carcinogen.   | Eyes, skin, respiratory system                    | Blue-white to steel gray lustrous, brittle, hard, odorless solid            |
| Lead                            | 7439-92-1  | 0.100 mg/m <sup>3</sup> | 0.50 mg/m <sup>3</sup> | Inhalation<br>Ingestion<br>Contact               | Irritation to the eyes, abdominal pain, weakness, insomnia, constipation  | Eyes, kidneys, blood, CNS, GI tract, reproductive | Heavy, ductile soft gray, solid   |
| Mercury                         | 7439-97-6  | 0.1 mg/m <sup>3</sup>   | 0.1 mg/m <sup>3</sup>  | Inhalation<br>Absorption<br>Ingestion<br>Contact | Irritation to the skin and eyes, chest pain, insomnia, irritability, weakness, headache   | Eyes, skin, CNS, kidneys, respiratory system      | Silver-white, heavy, odorless liquid  |
| Nickel                          | 7440-02-0  | 1 mg/m <sup>3</sup>     | 1 mg/m <sup>3</sup>    | Inhalation<br>Ingestion<br>Contact               | Hypersensitivity can cause allergic contact dermatitis, pulmonary asthma, and inflammatory reactions, potential carcinogen              | Nasal cavities, lungs, skin                       | Metal: lustrous, silvery, odorless solid                                    |

Note: Benz(a)anthracene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene do not have established exposure limits.

Metals present a potential for exposure to field personnel. The route of exposure from metals is via ingestion or inhalation of dust. Exposure may result in effects to the eye and skin, upper respiratory system, central nervous system and reproductive system. Metal poisoning may result from cumulative action; therefore, smoking, drinking or eating is prohibited in work areas where dust is generated. The exposure via inhalation or ingestion is considered to be low when good personal hygiene and dust control methods are implemented according to this plan.

PCBs pose a potential health risk through dermal exposure to PCB-laden oil or waste. Exposure through this route can cause chloracne, a severe skin disorder. Eye contact with PCBs can cause irritation and discharge. Overexposure via inhalation can lead to irritation of the respiratory tract, vomiting, jaundice, and abdominal pain. PCBs are persistent, lipophilic substances (strong affinity for lipids {fat cells}) which have a tendency to bioaccumulate.

Pesticides are grouped according to their chemical nature or use as organic phosphates, carbamates, fungicides, herbicides, fumigants, and few other miscellaneous. The most common route of exposure is ingestion. Other routes of exposure include inhalation and skin and eye absorption. The health effects vary greatly dependent upon their mechanism of toxic action. Organophosphates and carbamates are enzyme inhibitors. Chlorinated hydrocarbons, herbicides and rodenticides are CNS depressants or stimulants. Most are skin and eye irritants. Some compounds cause gastroenteritis, liver and kidney damage, encephalopathy, neuritis, ataxia and alopecia. The possibility of exposure via inhalation or ingestion is low to moderate.

#### **4.2 Physical Hazards**

Most physical hazards are discussed in the AHA in Appendix C for the different phases of this project or are located in Section 4.2 of the original SHSP.

#### **4.3 Biological Hazards**

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants. The biological hazards are the same as those addressed in Section 4.3 of the original SHSP.

### **5.0 ACTIVITY HAZARD ANALYSES**

The Activity Hazard Analysis is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, mitigate and control these hazards. The AHAs follow the guidance of the Foster Wheeler Environmental Corporate Program Manual HS 3-5. AHAs will be developed for all activities as necessary, prior to start-up. The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

AHAs are included in Appendix C of this Addendum to the original SHSP. AHAs have been developed for the following tasks:

- Pre-Mobilization Sampling/Surveying
- Mobilization
- Excavation/Confirmatory Sampling/Removal of Surface Debris
- Backfill/Topsoil/Seed
- Clearing/Grubbing

## **6.0 PERSONAL PROTECTIVE EQUIPMENT**

The personal protective equipment (PPE) detailed in the original SHSP represents the hazard analysis and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PHSM and SHSO are considered competent persons. The signatures contained in the approval section of the SHSP constitutes certification of the hazard assessment. For activities not detailed below, the SHSO will conduct the hazard assessment and select the PPE using the form provided in Appendix D and shall certify the assessment by signing the form. PPE selection will be made in consultation with the PHSM. The task- specific level of PPE required for each task is described in the AHA found in Appendix C.

## **7.0 AIR MONITORING**

The following sections contain information describing the types, frequency and location of real time air monitoring and integrated air monitoring.

### **7.1 Real-Time Air Monitoring**

#### **7.1.1 Work Area Air Monitoring**

This section addresses the real time air monitoring that will be conducted including instrumentation selection, frequency and location of air sampling. Real-time air monitoring will be conducted during soil sampling and excavation activities. Table 7.1 provides real-time air monitoring action levels.

The following instruments will be used for real-time air monitoring:

- Photo-Ionization Detector (PID) or Flame-Ionization Detector (FID)
- Combustible Gas Indicator (CGI)
- miniRAM (dust meter)
- Ionizing radiation survey meter

Monitoring will be performed by the SHSO every 30-60 minutes during soil sampling and excavation activities. A calibrated FID or PID organic vapor analyzer will be utilized to monitor the employee's breathing zone, and the soil samples after retrieval. The CGI will be used to

**TABLE 7.1 REAL TIME AIR MONITORING ACTION LEVELS**

| AIR MONITORING INSTRUMENT | MONITORING LOCATION     | ACTION LEVEL                         | SITE ACTION  | REASON  |
|---------------------------|-------------------------|--------------------------------------|--|---|
| PID/FID                   | Breathing Zone, Samples | 0.5 ppm to > 10 ppm above background | No action required.  | VOCs and SVOCs are expected to be very low  |
| PID/FID                   | Breathing Zone, Samples | 10 ppm - 25 ppm                      | No action required   | Concentrations are less than 1/2 the PEL for TCE  |
| PID/FID                   | Breathing Zone, Samples | >25 ppm - 250 ppm                    | Upgrade to Level C respiratory protection; initiate vapor suppression control efforts                  | Potential VOC exposure  |
| PID/FID                   | Breathing Zone, Samples | >250 ppm                             | Upgrade to Level B respiratory protection  | Assumes a conservative protection factor for respirators                                |
| CGI                       | Boreholes               | LEL < 10%                            | Investigate possible causes, use caution during procedures   | Increasing potential for ignition of vapors   |
| CGI                       | Boreholes               | LEL > 10%                            | Stop work; withdraw from work area   | Potential for ignition of vapors  |
| Mini-Ram                  | Breathing Zone          | > 2.5 mg/m <sup>3</sup> (total dust) | Upgrade to Level C and apply dust control measures to maintain dust levels below 2.5 mg/m <sup>3</sup> | 1/2 the action level for respirable dust; concentrations of metals in soil are very low |
| Radiation Survey Meters   | Excavation, Boreholes   | < 2x background                      | Continue working   | Conservative response   |
|                           | Breathing Zone          | >1 mr/hr                             | Discontinue work and notify PHSM   |   |

monitor boreholes. A miniRAM will be used to conduct dust monitoring within the work zone or the employee's breathing zone. The radiation survey meter will be utilized to measure potential exposure to employees per the methodology described above.

### 7.1.2 Perimeter Air Monitoring

The following real-time instruments will be used for perimeter monitoring:

- Photo-Ionization Detector (PID) or Flame-Ionization Detector (FID)
- miniRAM (dust meter)

The SHSO will periodically take readings downwind and from the perimeter of the work area to determine if there is a migration of contaminants off-site which might affect the public and the surrounding environment. These readings will be compared to background, and if greater than background, then work procedures will be reviewed.

### 7.1.3 Other

Ionizing radiation monitoring will be performed as stated in 7.1.1 and a gm pancake probe with thin window with an alpha, beta, gamma capability will be utilized and a NaI scintillation monitor. The SHSO shall record and average background outdoor measurements and compare the real-time monitoring results to the average.

## 7.2 **Integrated Air Monitoring**

Assessment and evaluation of field personnel exposures to airborne contaminants through integrated air monitoring shall be performed by the SHSO concurrent with activities which may generate the contaminants in excess of OSHA PELs. Refer to Table 7-2 for personal air sampling contaminants of concern. Badges or TLDs will be worn by employees who work in proximity to soil loading.

### 7.2.1 Work Area Air Monitoring

Table 7.2 summarizes the integrated air monitoring which will be conducted. Air samples will be collected within the exclusion zone and along the site perimeter. Monitoring will be performed to determine the level of respiratory protection within the exclusion zone and to document that off-site migration of contaminants will not occur. Sampling media includes a three-piece filter cassette, tygon tubing and a pump at 2 liters per minute (1 pm) for eight hours. The sampling and analytical protocol will be consistent with NIOSH methods.

Monitoring will continue at the same frequency listed in Table 7.2 if the results are 75% or greater of the PEL. Engineering and administrative controls will also be implemented at this time to reduce exposure. Monitoring will discontinue if the results are less than 75% of the PEL and the real-time air monitoring is less than 2.5 mg/m<sup>3</sup>. If real-time air monitoring is 2.5 mg/m<sup>3</sup> or greater,

**Table 7.2 Frequency and Location of Integrated Air Monitoring**

| LOCATION OR ACTIVITY  | CONTAMINANT                                     | FREQUENCY  |
|---|---|--|
| Operators of drill rig and excavators and any other high risk individuals subject to contaminant exposure | Chromium and lead                               | Two times per week   |
| Perimeter - four locations and one co-location  | Chromium, lead and total suspended particulates | Two times a week during excavation. Blanks will be collected at a rate of one per every ten samples. |

continue monitoring and implement engineering controls. Monitoring will continue and engineering controls implemented if real-time monitoring is 2.5 or greater.

Procedures to be followed include:

- Selection of high-risk individuals who may be subject to contaminant exposure, based on job assignment and observations of the SHSO.
- Air sampling pumps used to collect worker exposure samples shall be calibrated before and after use each day. Calibration shall be accomplished using a primary standard calibration system, e.g., the bubble tube method. Results of the calibrations shall be included in the health and safety field logbook and calibration logs.
- Chemical analysis of samples collected for assessment of employee exposures shall be performed only by analytical laboratories accredited by the American Industrial Hygiene Association.

#### 7.2.2 Perimeter Air Monitoring

Site perimeter air monitoring samples will be collected two times a week from four sampling locations and one co-location. Samples will be analyzed for metals on a 24-hour turnaround period for the first week and one week turnaround period for the second to fourth weeks. Blanks will be collected at a rate of one per every ten environmental samples.

### 7.3 **Data Quality Assurance**

#### 7.3.1 Calibration

Instrument calibration shall be documented and included in a dedicated safety and health log book or on separate calibration pages. All instruments shall be calibrated before and after each shift.

Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

#### 7.3.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SHSO for reference.

#### 7.3.3 Data Review

The SHSO will interpret monitoring data based upon Table 7.1 and his/her professional judgment. The data will be reviewed and evaluated to determine the potential for worker exposure, upgrade/downgrades in levels of protection, comparison to direct reading instrumentation and changes in the integrated air monitoring strategy. The SHSO will immediately report all integrated

sampling results at or above 75% of the PEL/TLV (one half of PEL/TLV where no respirators are worn) to the PHSM. Periodically, personnel exposure results will be tabulated and posted at the site.

## **8.0 ZONES, PROTECTION AND COMMUNICATION**

Work zone set up will be consistent with the provisions required in Section 8.0 of the original SHSP. Pressure washers and/or brushes will be used to clean heavy equipment or trucks which come into contact with site contaminants. No heavy equipment will be permitted to leave site unless it has been decontaminated and visually inspected by the SHSO or his designee.

## **9.0 MEDICAL SURVEILLANCE PROCEDURES**

Medical surveillance procedures will be consistent with those previously required as part of Section 9.0 of the original SHSP.

## **10.0 SAFETY CONSIDERATIONS**

### **10.1 General Health and Safety Work Rules**

A list of work rules and general safe work practices has been included in the Foster Wheeler Environmental Health and Safety Program Manual, Section 3-6. These rules have been incorporated into the original SHSP as Appendix G. The work rules will be posted in a conspicuous location at the site.

### **10.2 General Construction Hazards**

The following is a list of applicable safety considerations for the major tasks. Further information is provided in the Activity Hazard Analysis and the Foster Wheeler Environmental Health and Safety Program Manual.

- Heavy Equipment (bucket loader, excavator and drill rig)
- Fire Hazards
- Slips/Trips/Falls
- Lifting/Materials Handling

## **11.0 WASTE DISPOSAL PROCEDURES**

All discarded materials, waste materials or other objects shall be handled in such a way as is consistent with Section 11.0 of the original SHSP. Adequate means shall be provided for the containment of waste water generated during equipment decontamination activities.

## **12.0 EMERGENCY RESPONSE PLAN**

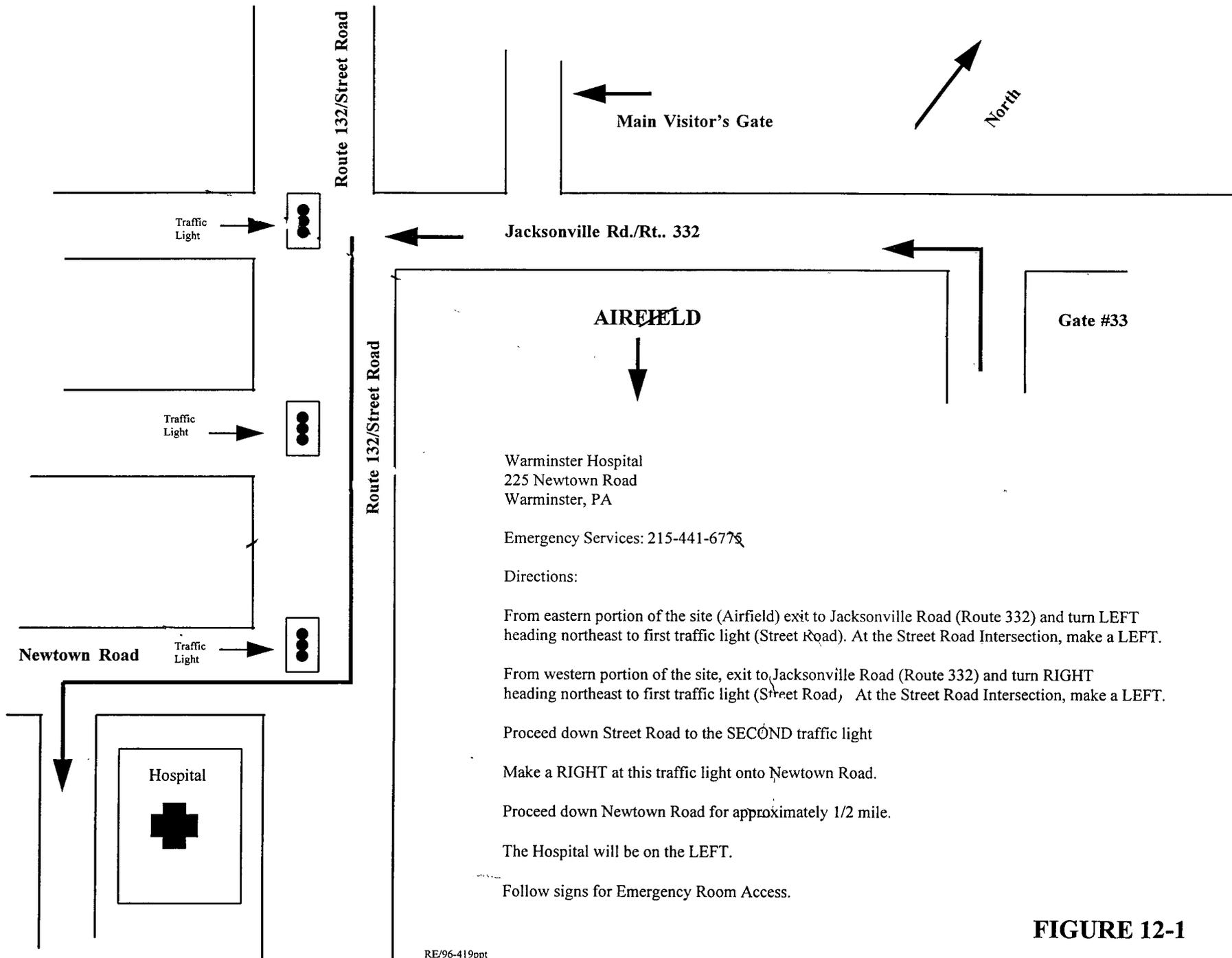
The Emergency Response Plan will be consistent with the plan in Section 12.0 of the original SHSP. A map with the route to the hospital is shown in Figure 12.1. Table 12.2 contains an updated list of emergency telephone numbers.

## **13.0 TRAINING**

Training procedures will be consistent with those described in Section 13.0 of the original SHSP.

## **14.0 LOGS, REPORTS AND RECORD KEEPING**

Site logs, reports and record keeping will be maintained in a consistent manner with those described in Section 14.0 of the original SHSP.



Warminster Hospital  
225 Newtown Road  
Warminster, PA

Emergency Services: 215-441-6775

Directions:

From eastern portion of the site (Airfield) exit to Jacksonville Road (Route 332) and turn LEFT heading northeast to first traffic light (Street Road). At the Street Road Intersection, make a LEFT.

From western portion of the site, exit to Jacksonville Road (Route 332) and turn RIGHT heading northeast to first traffic light (Street Road). At the Street Road Intersection, make a LEFT.

Proceed down Street Road to the SECOND traffic light

Make a RIGHT at this traffic light onto Newtown Road.

Proceed down Newtown Road for approximately 1/2 mile.

The Hospital will be on the LEFT.

Follow signs for Emergency Room Access.

**FIGURE 12-1**

**TABLE 12.2 EMERGENCY TELEPHONE NUMBERS**

| <b>Contact</b>                             | <b>Firm or Agency</b>                                      | <b>Telephone Number</b>         |
|--|--|---------------------------------|
| Police                                     | Local  | 215-674-3333                    |
| Fire                                       | Local  | 215-672-1000                    |
| Hospital                                   | Warminster General Hospital                                | 215-441-6000<br>ER-215-441-6775 |
| Ernie Beatty                               | Navy ROICC   | 215-441-2745                    |
| EPA Region Branch<br>Response Center       | Federal  | 215-597-9800                    |
| PHSM, Grey Coppi                           | Foster Wheeler Environmental                               | 215-702-4079                    |
| Project Superintendent<br>William Dolhancy | Foster Wheeler Environmental                               | 610-446-6172                    |
| SHSO, Dave Dougherty                       | Foster Wheeler Environmental                               | 610-431-2590                    |
| Poison Control Center                      |  | 215-386-2100                    |
| Chemtrec                                   |  | 800-424-9300                    |
| National Response Center                   |  | 800-424-8802                    |
| DO Manager-Ed Leonard                      | Foster Wheeler Environmental                               | 215-702-4074                    |
| Regulatory Affairs-<br>Tom Teeling         | Foster Wheeler Environmental                               | 215-702-4078                    |
| LEPC                                       | John Dougherty<br>Bucks Co. Emergency<br>Management Agency | 215-348-7518                    |
| Base Security                              |  | 441-2097                        |
| NOSC                                       | Fire Chief   | 441-3333                        |



## 16.0 REFERENCES

American Conference of Governmental Industrial Hygienists, Inc., 1992, Documentation of the threshold limit values and biological exposure indices; 6th Ed., ACGIH, Cincinnati, Ohio.

American Conference of Governmental Industrial Hygienists, Inc., 1987, Guidelines for the selection of chemical protective clothing; Third Edition, ACGIH, Cincinnati, Ohio, February 1987.

American Conference of Governmental Industrial Hygienists, Inc., 1994-1995, Threshold limit values for chemical substances and physical agents in the work environment and biological exposure indices; ACGIH, Cincinnati, Ohio.

Federal Acquisition Regulation, F.A.R. Clause 52.236-13: Accident Prevention.

Foster Wheeler Environmental Corporation, Foster Wheeler Environmental Corporation Health and Safety Manual, 1995.

NIOSH/OSHA/USCG/EPA, 1985, Occupational safety and health, guidance manual for hazardous waste site activities; October 1985.

Sax, N. Irving, 1992, Dangerous properties of industrial materials, 8th Ed; Van Nostrand Reinhold Co. Inc., New York, NY.

U.S. Army Corps of Engineers, 1987, Safety and health requirements manual; EM 385-1-1, revised October 1992.

U.S. Department of Labor, Occupational Safety and Health Administration, 1989, 29 CFR Part 1910 Hazardous waste operations and emergency response, final rule, March 6, 1989; Construction industry standards, 29 CFR 1926; and General industry standards, 29 CFR 1910.

U.S. Environmental Protection Agency, 1988, Standard operating safety guides; July, 1988.

U.S. Environmental Protection Agency, no date, Response safety decision-making; Course manual, Office of Emergency and Remedial Response, Hazardous Response Support Division.

**APPENDIX A**

**FIELD CHANGE REQUEST FORM**

HASP FIELD CHANGE

Field Change Number: \_\_\_\_\_ Date Effective: \_\_\_\_\_

Pen and Ink changes to be made in the HASP to alert the reader of this change:

Reason for the change to be incorporated into the HASP:

**TEXT OF CHANGE TO BE INCORPORATED:**

FOSTER WHEELER ENVIRONMENTAL  
FIELD CHANGE REQUEST FORM

PROJECT:

CHARGE NUMBER:

PROJECT LOCATION:

DESCRIPTION OF CHANGE:

REASON FOR CHANGE:

RECOMMENDED DISPOSITION:

SITE MANAGER:

Signature

Date

PROJECT SAFETY AND HEALTH MANAGER:

Signature

Date

DISTRIBUTION: Project Health and Safety Manager  
Site Health and Safety Officer  
Quality Assurance Representative  
Field Operation Leader

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**APPENDIX B**  
**ANALYTICAL RESULTS**

TABLE C-1  
 OCCURRENCE AND DISTRIBUTION OF INORGANICS IN SURFACE SOIL AT SITE 06  
 WARMINSTER, PENNSYLVANIA  
 (mg/kg)

| SUBSTANCE | BACKGROUND                   |                        | SITE-RELATED                 |                          |                              |                          |
|-----------|------------------------------|------------------------|------------------------------|--------------------------|------------------------------|--------------------------|
|           | REPRESENTATIVE CONCENTRATION | FREQUENCY OF DETECTION | RANGE OF POSITIVE DETECTION* | STATISTICAL DISTRIBUTION | REPRESENTATIVE CONCENTRATION | POPULATION COMPARISONS** |
| ALUMINUM  | 16481.16                     | 20 / 20                | 11500 - 22100                | NORMAL                   | 15895.78                     | NOT DIFFERENT            |
| ARSENIC   | 12.1                         | 20 / 20                | 4.2 - 7.5                    | NORMAL                   | 5.80                         | NOT DIFFERENT            |
| BARIUM    | 81.71                        | 20 / 20                | 32 - 161                     | NORMAL                   | 84.87                        | NOT DIFFERENT            |
| BERYLLIUM | 0.88                         | 20 / 20                | 0.47 - 1.9                   | NONPARAMETRIC DIST       | 1.08                         | NOT DIFFERENT            |
| CADMIUM   | -                            | 2 / 20                 | 5.9 - 8.8                    | NORMAL OVER LOGNORMAL    | 2.10                         | NOT DIFFERENT            |
| CHROMIUM  | 24.66                        | 20 / 20                | 14.05 - 414                  | NORMAL OVER LOGNORMAL    | 105.46                       | NOT DIFFERENT            |
| COBALT    | 10.34                        | 20 / 20                | 5.1 - 15.95                  | NONPARAMETRIC DIST       | 10.88                        | NOT DIFFERENT            |
| COPPER    | 12.51                        | 20 / 20                | 7.3 - 316                    | NORMAL OVER LOGNORMAL    | 64.97                        | SITE > BACKGROUND        |
| CYANIDE   | -                            | 3 / 20                 | 3.9 - 4.7                    | NORMAL OVER LOGNORMAL    | 1.65                         | NOT DIFFERENT            |
| IRON      | 25442.54                     | 20 / 20                | 16400 - 31700                | NONPARAMETRIC DIST       | 22951.34                     | NOT DIFFERENT            |
| LEAD      | 26.47                        | 20 / 20                | 8.3 - 634                    | NORMAL OVER LOGNORMAL    | 124.58                       | SITE > BACKGROUND        |
| MANGANESE | 495.07                       | 20 / 20                | 123 - 3040                   | NORMAL                   | 818.34                       | NOT DIFFERENT            |
| MERCURY   | -                            | 9 / 20                 | 0.05 - 0.57                  | NORMAL OVER LOGNORMAL    | 0.13                         | NOT DIFFERENT            |
| NICKEL    | 13.42                        | 9 / 20                 | 12.1 - 19.6                  | NORMAL OVER LOGNORMAL    | 11.31                        | NOT DIFFERENT            |
| SILVER    | -                            | 7 / 20                 | 0.77 - 22.3                  | NORMAL OVER LOGNORMAL    | 4.93                         | NOT DIFFERENT            |
| VANADIUM  | 37.58                        | 20 / 20                | 23.2 - 41.7                  | NONPARAMETRIC DIST       | 33.38                        | NOT DIFFERENT            |
| ZINC      | 37.86                        | 20 / 20                | 25 - 360                     | NORMAL OVER LOGNORMAL    | 106.17                       | SITE > BACKGROUND        |

\* = QUALIFIERS FOR DATA ARE PRESENTED IN DATA PRESENTATION TABLES

\*\* = STATISTICAL COMPARISON OF SITE TO BACKGROUND DISTRIBUTIONS TO DETERMINE WHETHER THE SITE-RELATED POOL OF CONCENTRATIONS IS ELEVATED RELATIVE TO BACKGROUND  
 NOT DIFFERENT - THE CHEMICAL IS EXCLUDED FROM CONSIDERATION AS HAVING SITE-RELATED CONCENTRATIONS

(i.e. USING NON-NORMAL STATISTICS, THE SITE-RELATED POPULATION IS STATISTICALLY INDISTINGUISHABLE FROM BACKGROUND)

SITE > BACKGROUND = THE POPULATION OF THE SITE IS STATISTICALLY HIGHER THAN THE POPULATION OF BACKGROUND

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TABLE C-3  
 OCCURRENCE AND DISTRIBUTION OF INORGANICS IN SUBSURFACE SOIL AT SITE 06  
 WARMINSTER, PENNSYLVANIA  
 (mg/kg)

| SUBSTANCE | BACKGROUND                   | SITE-RELATED           |                              |                          |                              |                          |
|-----------|------------------------------|------------------------|------------------------------|--------------------------|------------------------------|--------------------------|
|           | REPRESENTATIVE CONCENTRATION | FREQUENCY OF DETECTION | RANGE OF POSITIVE DETECTION* | STATISTICAL DISTRIBUTION | REPRESENTATIVE CONCENTRATION | POPULATION COMPARISONS** |
| ALUMINUM  | 16481.16                     | 35 / 35                | 2080 - 251000                | NORMAL OVER LOGNORMAL    | 40451.67                     | NOT DIFFERENT            |
| ANTIMONY  | 8.510291                     | 15 / 35                | 9.4 - 731                    | NORMAL OVER LOGNORMAL    | 79.08                        | SITE > BACKGROUND        |
| ARSENIC   | 12.1                         | 32 / 35                | 0.86 - 80.7                  | NORMAL OVER LOGNORMAL    | 10.63                        | NOT DIFFERENT            |
| BARIUM    | 81.71                        | 32 / 35                | 6 - 922                      | NORMAL                   | 244.95                       | SITE > BACKGROUND        |
| BERYLLIUM | 0.88                         | 28 / 35                | 0.46 - 2.3                   | NORMAL OVER LOGNORMAL    | 0.99                         | NOT DIFFERENT            |
| CADMIUM   | -                            | 18 / 35                | 0.41 - 78.2                  | NORMAL OVER LOGNORMAL    | 17.20                        | NOT DIFFERENT            |
| CALCIUM   | 898                          | 32 / 35                | 165 - 116000                 | NORMAL OVER LOGNORMAL    | 17862.31                     | NOT DIFFERENT            |
| CHROMIUM  | 24.66                        | 29 / 31                | 17.1 - 10100                 | NORMAL OVER LOGNORMAL    | 1725.81                      | SITE > BACKGROUND        |
| COBALT    | 10.34                        | 29 / 35                | 4.2 - 92.5                   | NORMAL OVER LOGNORMAL    | 18.92                        | NOT DIFFERENT            |
| COPPER    | 12.51                        | 32 / 35                | 4.6 - 14300                  | NORMAL OVER LOGNORMAL    | 1372                         | SITE > BACKGROUND        |
| IRON      | 25442.54                     | 35 / 35                | 4120 - 246000                | NORMAL OVER LOGNORMAL    | 52946.91                     | NOT DIFFERENT            |
| LEAD      | 26.47                        | 33 / 33                | 3.8 - 39300                  | NORMAL OVER LOGNORMAL    | 3585.02                      | SITE > BACKGROUND        |
| MAGNESIUM | 2722.56                      | 33 / 35                | 230 - 23700                  | NORMAL OVER LOGNORMAL    | 4329.48                      | NOT DIFFERENT            |
| MANGANESE | 495.07                       | 33 / 33                | 25.4 - 1210                  | LOGNORMAL                | 755.38                       | SITE > BACKGROUND        |
| MERCURY   | -                            | 18 / 33                | 0.06 - 9.9                   | NORMAL OVER LOGNORMAL    | 1.83                         | SITE > BACKGROUND        |
| NICKEL    | 13.42                        | 34 / 35                | 4.6 - 345                    | NORMAL OVER LOGNORMAL    | 56.68                        | SITE > BACKGROUND        |
| POTASSIUM | 1050.17                      | 35 / 35                | 84.5 - 1690                  | LOGNORMAL                | 1280.46                      | NOT DIFFERENT            |
| SELENIUM  | -                            | 6 / 35                 | 0.83 - 5                     | NORMAL OVER LOGNORMAL    | 0.93                         | NOT DIFFERENT            |
| SILVER    | -                            | 14 / 35                | 1.8 - 330                    | NORMAL OVER LOGNORMAL    | 59.89                        | NOT DIFFERENT            |
| SODIUM    | 73.2                         | 20 / 35                | 29.1 - 2200                  | NORMAL OVER LOGNORMAL    | 289.58                       | NOT DIFFERENT            |
| VANADIUM  | 37.58                        | 32 / 35                | 2.7 - 154                    | LOGNORMAL OVER NORMAL    | 110.92                       | NOT DIFFERENT            |
| ZINC      | 37.86                        | 32 / 35                | 11.4 - 5320                  | NORMAL OVER LOGNORMAL    | 1041.67                      | SITE > BACKGROUND        |

\* = QUALIFIERS FOR DATA ARE PRESENTED IN DATA PRESENTATION TABLES

\*\* = STATISTICAL COMPARISON OF SITE TO BACKGROUND DISTRIBUTIONS TO DETERMINE WHETHER THE SITE-RELATED POOL OF CONCENTRATIONS IS ELEVATED RELATIVE TO BACKGROUND  
 NOT DIFFERENT - THE CHEMICAL IS EXCLUDED FROM CONSIDERATION AS HAVING SITE-RELATED CONCENTRATIONS

(i.e. USING NON-NORMAL STATISTICS, THE SITE-RELATED POPULATION IS STATISTICALLY INDISTINGUISHABLE FROM BACKGROUND)

SITE > BACKGROUND = THE POPULATION OF THE SITE IS STATISTICALLY HIGHER THAN THE POPULATION OF BACKGROUND

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TABLE C-4  
 OCCURRENCE AND DISTRIBUTION OF ORGANICS IN SUBSURFACE SOIL AT SITE 06  
 WARMINSTER, PENNSYLVANIA  
 (ug/kg)

| SUBSTANCE                 | BACKGROUND                   | SITE-RELATED           |                              |                          |                              |
|---------------------------|------------------------------|------------------------|------------------------------|--------------------------|------------------------------|
|                           | REPRESENTATIVE CONCENTRATION | FREQUENCY OF DETECTION | RANGE OF POSITIVE DETECTION* | STATISTICAL DISTRIBUTION | REPRESENTATIVE CONCENTRATION |
| 1,1,1-TRICHLOROETHANE     | -                            | 1 / 34                 | 4                            | NORMAL OVER LOGNORMAL    | 4                            |
| 1,2-DICHLOROETHENE (TOTAL | -                            | 3 / 34                 | 92 - 200                     | NORMAL OVER LOGNORMAL    | 200                          |
| 2-BUTANONE                | -                            | 1 / 34                 | 79                           | NORMAL OVER LOGNORMAL    | 79                           |
| 2-METHYLNAPHTHALENE       | -                            | 2 / 14                 | 50 - 6700                    | NORMAL OVER LOGNORMAL    | 6700                         |
| 4,4'-DDD                  | 4.771006                     | 2 / 18                 | 23 - 530                     | NORMAL OVER LOGNORMAL    | 94.84                        |
| 4,4'-DDE                  | 163.901658                   | 2 / 18                 | 5.5 - 101.5                  | NORMAL OVER LOGNORMAL    | 32.91                        |
| 4,4'-DDT                  | 286.61                       | 6 / 18                 | 4.8 - 94.5                   | NORMAL OVER LOGNORMAL    | 39.42                        |
| ACENAPHTHYLENE            | -                            | 1 / 14                 | 61                           | NORMAL OVER LOGNORMAL    | 61                           |
| ACETONE                   | 2                            | 3 / 34                 | 380 - 10000                  | NORMAL OVER LOGNORMAL    | 896.51                       |
| ALPHA-CHLORDANE           | -                            | 3 / 18                 | 5.9 - 170                    | NORMAL OVER LOGNORMAL    | 33.48                        |
| ANTHRACENE                | -                            | 1 / 14                 | 311.5                        | NORMAL OVER LOGNORMAL    | 311.50                       |
| AROCLOR-1242              | -                            | 1 / 18                 | 21                           | NORMAL OVER LOGNORMAL    | 21                           |
| AROCLOR-1254              | 51                           | 10 / 18                | 7.2 - 1200                   | NORMAL OVER LOGNORMAL    | 379.47                       |
| AROCLOR-1260              | -                            | 1 / 18                 | 5000                         | NORMAL OVER LOGNORMAL    | 893.16                       |
| BENZO(A)ANTHRACENE        | -                            | 4 / 14                 | 48 - 1470                    | NORMAL OVER LOGNORMAL    | 1470                         |
| BENZO(A)PYRENE            | -                            | 4 / 14                 | 68 - 1385                    | NORMAL OVER LOGNORMAL    | 1385                         |
| BENZO(B)FLUORANTHENE      | 58.00                        | 4 / 14                 | 82 - 2000                    | NORMAL OVER LOGNORMAL    | 2000                         |
| BENZO(G,H,I)PERYLENE      | -                            | 4 / 14                 | 53 - 2000                    | NORMAL OVER LOGNORMAL    | 2000                         |
| BENZO(K)FLUORANTHENE      | 46                           | 2 / 14                 | 180 - 730                    | NORMAL OVER LOGNORMAL    | 730                          |
| BIS(2-ETHYLHEXYL)PHTHAL   | 50                           | 4 / 14                 | 67 - 1900                    | NORMAL OVER LOGNORMAL    | 1900                         |
| BUTYLBENZYL PHTHALATE     | -                            | 1 / 14                 | 5100                         | NORMAL OVER LOGNORMAL    | 5100                         |
| CARBAZOLE                 | -                            | 1 / 14                 | 74                           | NORMAL OVER LOGNORMAL    | 74                           |
| CARBON DISULFIDE          | -                            | 1 / 34                 | 2                            | NORMAL OVER LOGNORMAL    | 2                            |
| CHRYSENE                  | 51                           | 5 / 14                 | 59 - 3300                    | NORMAL OVER LOGNORMAL    | 3300                         |
| DI-N-BUTYL PHTHALATE      | -                            | 1 / 14                 | 44                           | NORMAL OVER LOGNORMAL    | 44                           |
| DIELDRIN                  | -                            | 2 / 16                 | 4.8 - 6.1                    | NORMAL OVER LOGNORMAL    | 6.10                         |
| ENDOSULFAN I              | -                            | 1 / 18                 | 2.2                          | NORMAL OVER LOGNORMAL    | 2.2                          |
| ENDOSULFAN II             | -                            | 1 / 18                 | 17                           | NORMAL OVER LOGNORMAL    | 17                           |
| ENDRIN                    | -                            | 1 / 15                 | 21                           | NORMAL OVER LOGNORMAL    | 21                           |
| ENDRIN KETONE             | -                            | 1 / 18                 | 8.2                          | NORMAL OVER LOGNORMAL    | 8.2                          |
| ETHYLBENZENE              | -                            | 3 / 34                 | 7 - 140000                   | NORMAL OVER LOGNORMAL    | 11159.31                     |
| FLUORANTHENE              | 92                           | 5 / 14                 | 54 - 3285                    | NORMAL OVER LOGNORMAL    | 3285                         |
| GAMMA-CHLORDANE           | -                            | 5 / 18                 | 4.8 - 210                    | NORMAL OVER LOGNORMAL    | 41.36                        |
| HEPTACHLOR                | -                            | 1 / 18                 | 11                           | NORMAL OVER LOGNORMAL    | 11                           |
| INDENO(1,2,3-CD)PYRENE    | -                            | 3 / 14                 | 46 - 830                     | NORMAL OVER LOGNORMAL    | 830                          |
| METHOXYCHLOR              | -                            | 1 / 18                 | 18                           | NORMAL OVER LOGNORMAL    | 18                           |
| NAPHTHALENE               | -                            | 1 / 14                 | 76                           | NORMAL OVER LOGNORMAL    | 76                           |
| PYRENE                    | 100                          | 6 / 14                 | 50 - 3000                    | NORMAL OVER LOGNORMAL    | 3000                         |
| TETRACHLOROETHENE         | -                            | 4 / 34                 | 4 - 450                      | NORMAL OVER LOGNORMAL    | 450                          |
| TOLUENE                   | -                            | 2 / 34                 | 690 - 50000                  | NORMAL OVER LOGNORMAL    | 3989.72                      |
| TOTAL XYLENES             | -                            | 4 / 34                 | 3 - 180000                   | NORMAL OVER LOGNORMAL    | 14912.30                     |
| TRICHLOROETHENE           | -                            | 3 / 34                 | 690 - 2500                   | NORMAL OVER LOGNORMAL    | 849.38                       |

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**APPENDIX C**  
**ACTIVITY HAZARD ANALYSIS**

## ACTIVITY HAZARD ANALYSIS

| Project: <u>SITE 6 NAWC WARMINSTER</u><br>Activity: <u>TASK 2 - MOBILIZATION</u>   |   | Location: <u>WARMINSTER, PA</u>  |
|--|---|--|
| MAJOR STEPS  | POTENTIAL HAZARDS   | PROTECTIVE MEASURES/CONTROLS   |
| 1. Preparation of work area. (Hazards and Controls 1-3 apply)  | 1. Back Injuries  | 1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.   |
| 2. Transportation of equipment and delivery of materials (Hazards and Controls 1-5 apply)  | 2. Slips/Trips/Falls  | 2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.  |
| 3. Construction of decontamination pad (Hazards and Controls 1-8 apply)  | 3. Pinch/Cut/Smash  | 3. Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools  |
| 4. Construction of a clean gravel road (Hazards and Controls 1-8 apply)  | 4. Vehicular Traffic  | 4. Spotters will be used when backing up trucks and moving equipment   |
| 5. Construction of stockpile areas (Hazards and Controls 1-8 apply)  | 5. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)  | 5. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms |
| 6. Installation of temporary site support facilities (Hazards and Controls 1-3 and 5-8 apply)  | 6. Noise  | 6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers   |
|  | 7. Electrocutation  | 7. Ground fault circuit interrupters will be used; cords will be kept off and out of wet areas unless they are approved submersible type; cords will be inspected prior to use; damaged equipment will be tagged and taken out of service  |
|  | 8. Fire   | 8. Smoking will not be allowed in work area; 10-lb. ABC type fire extinguishers shall be readily available   |
| EQUIPMENT USED   | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS  |
| <ol style="list-style-type: none"> <li>1. Hand and Power Tools</li> <li>2. Level D PPE</li> <li>3. First Aid Kits</li> <li>4. GFCIs and Extension Cords</li> <li>5. Portable Eyewash</li> <li>6. Fire Extinguishers</li> <li>7. Heavy Equipment</li> </ol> | <ol style="list-style-type: none"> <li>1. Initial inspections will be required prior to use of hand and power tools</li> <li>2. Monthly inspections will be performed on fire extinguishers.</li> <li>3. Daily safety and weekly inspections will be performed on first aid kits.</li> <li>4. Extension cords will be inspected prior to each use.</li> <li>5. Heavy equipment will be inspected prior to each use.</li> <li>6. Portable eye wash will be inspected monthly.</li> <li>7. GFCIs will be inspected monthly</li> </ol> | <ol style="list-style-type: none"> <li>1. Personnel have read and comply with SHSP</li> <li>2. Site specific training</li> <li>3. Qualified operators will be used for heavy equipment operation</li> <li>4. Instruct personnel on proper use of fire extinguishers</li> <li>5. At least 2 individuals on-site will have current CPR and First aid training</li> <li>6. Personnel will be trained to use power tools safely</li> <li>7. Personnel will be trained on proper use of extension cords</li> </ol>  |

## ACTIVITY HAZARD ANALYSIS

| Project: <u>SITE 6 NAWC WARMINSTER</u><br>Activity: <u>TASK 1 - PRE-MOBILIZATION SAMPLING/SURVEYING</u>   |   | Location: <u>WARMINSTER, PA</u>   |
|---|---|---|
| MAJOR STEPS   | POTENTIAL HAZARDS   | PROTECTIVE MEASURES/CONTROLS  |
| 1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)                                | 1. Back Injuries  | 1. Lift work structures to 30-36 inches above ground; site personnel will be instructed on proper lifting techniques; Mechanical devices (wheel barrow) should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.  |
| 2. Survey trench layouts (Hazard and Control 2 applies)   | 2. Slips/Trips/Falls  | 2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.   |
| 3. Conduct drilling and collection of soil samples (Hazards and Controls 1 and 2-13 apply)                | 3. Vehicular Traffic  | 3. Spotters will be used when backing up trucks, heavy equipment and moving equipment   |
| 4. Decontaminate drill rig and sampling equipment (Hazards and Controls 2, 6, 7, 10, 13, 15 and 16 apply) | 4. Overhead Hazards   | 4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1.  |
|   | 5. Dropped Objects  | 5. Steel toe boots meeting ANSI Standard Z41 will be worn.  |
|   | 6. Noise  | 6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers.   |
|   | 7. Eye Injuries   | 7. Safety glasses meeting ANSI Standard Z87 will be worn during drilling and sampling operations; Pressure washing requires chemical goggles and a full-faced shield.   |
|   | 8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)    | 8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms. |
|   | 9. Fire   | 9. ABC type fire extinguishers shall be readily available; no smoking in work area; monitor with a CGI.   |
|   | 10. Chemical Exposure to metals/VOs<br>Chemical Exposure to alcohol and/or hexane | 10. Protective clothing (i.e., Level C PPE: Tyvek, chemical gloves and chemical resistant boots) will be worn during drilling and sampling operations; skin will be rinsed with water if contact with hazardous material occurs; a portable eye wash station will be located by work area; Pressure washing requires the use of chemical goggles, tyvek and full-faced shield; perform PID air monitoring for decon chemicals, consult with PHSM if any readings greater than 5 ppm.  |
|   | 11. Spills  | 11. Spill and absorbent materials will be readily available.  |
|   | 12. Underground Hazards   | 12. All underground utilities will be identified prior to drilling and excavation; dig safe number(s) will be logged and documented.  |

Project: SITE 6 NAWC WARMINSTER  
 Activity: TASK 1 - PRE-MOBILIZATION SAMPLING/SURVEYING

Location: WARMINSTER, PA

| MAJOR STEPS   | POTENTIAL HAZARDS   | PROTECTIVE MEASURES/CONTROLS   |
|---|---|--|
|   | 13. Inhalation Exposure to metals/VOs<br>Chemical Exposure to alcohol and/or hexane   | 13. Drilling activities will be conducted in Modified Level D respiratory protection; air monitoring will be performed as required by SHSP.  |
|   | 14. Pinch/Cut/Smash   | 14. Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools.  |
|   | 15. Struck by (pressurized water stream)  | 15. Proper instruction of safe use of pressure washers will be conducted; operators will not fix the hand trigger in the open position such that if the wand were left unattended, water would spray from the tip; all pressure washers will be equipped with a deadman switch.        |
|   | 16. Repetitive trauma injury during deconning spoons  | 16. Use lab-type squirt bottles, not trigger sprayers, to decon spoons; rotate job assignments; lift work surfaces to 30-36 inches aboveground.  |
| EQUIPMENT USED  | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS  |
| 1. Drill Rig<br>2. Level C and Modified Level D PPE<br>3. First Aid Kits<br>4. Portable Eyewash<br>5. Fire Extinguishers<br>6. Pressure Washer<br>7. Monitoring Equipment (CGI, PID/FID, miniRAM) | 1. Monthly inspections will be performed on fire extinguishers.<br>2. Daily safety and weekly inspections will be performed on first aid kits.<br>3. Portable eye wash will be inspected monthly.<br>4. Pressure washers will be inspected prior to each use.<br>5. Drill rig will be inspected prior to each use.<br>6. Monitoring equipment will be calibrated daily (Pre and Post) | 1. Personnel have read and comply with SHSP<br>2. Site specific training<br>3. Qualified operators will be used for drill rig operation<br>4. Instruct personnel on proper use of fire extinguishers<br>5. At least 2 individuals on-site will have current CPR and First aid training |

## ACTIVITY HAZARD ANALYSIS

| Project: <u>Site 6 NAWC WARMINSTER</u>   |  | Location: <u>WARMINSTER, PA</u>   |
|--|--|---|
| Activity: <u>TASK 3 - EXCAVATION/CONFIRMATORY SAMPLING/REMOVAL OF SURFACE DEBRIS</u> |  |   |
| MAJOR STEPS  | POTENTIAL HAZARDS  | PROTECTIVE MEASURES/CONTROLS  |
| 1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)           | 1. Back Injuries   | 1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available; Instruct personnel on proper lifting techniques.  |
| 2. Excavate soil (Hazards and Controls 1-14 and 16 apply)                            | 2. Slips/Trips/Falls   | 2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.   |
| 3. Removal of surface debris (Hazards and Controls 1-14 and 16 apply)                | 3. Vehicular Traffic   | 3. Spotters will be used when backing up trucks, heavy equipment and moving equipment.  |
| 4. Collect soil samples (Hazards and Controls 1, 2, 7, 10, and 13 apply)             | 4. Overhead Hazards  | 4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1.  |
| 5. Pressure wash heavy equipment (Hazards and Controls 2, 6, 7, 10, 13 and 15 apply) | 5. Dropped Objects   | 5. Steel toe boots meeting ANSI Standard Z41 will be worn.  |
|  | 6. Noise   | 6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers  |
|  | 7. Eye Injuries  | 7. A full-face respirator will be worn during excavation/removal and soil sampling operations, pressure washing requires chemical goggles and a full-face shield  |
|  | 8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against) | 8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms. |
|  | 9. Fire  | 9. ABC type fire extinguishers shall be readily available; No smoking in work area  |
|  | 10. Chemical Exposure to metals, VOs   | 10. Excavation/removal operations and soil sampling will require Level C PPE to begin with; pressure washing requires the use of tyvek, chemical resistant gloves.  |
|  | 11. Spills   | 11. Spill and absorbent materials will be readily available.  |
|  | 12. Underground Hazards  | 12. All underground utilities will be identified prior to Excavation/removal; dig safe number(s) will be logged and documented.   |
|  | 13. Inhalation Exposure to metals, VOs   | 13. Excavation/removal activities will be conducted in Level C PPE to begin with; air monitoring will be performed as required by SHSP.   |
|  | 14. Pinch/Cut/Smash  | 14. Cut resistant work gloves will be worn when dealing with sharp objects; all hand and power tools will be maintained in safe condition; guards will be kept in place while using hand and power tools.   |

Project: Site 6 NAWC WARMINSTER  
 Activity: TASK 3 - EXCAVATION/CONFIRMATORY SAMPLING/REMOVAL OF SURFACE DEBRIS

Location: WARMINSTER, PA

| MAJOR STEPS   | POTENTIAL HAZARDS  | PROTECTIVE MEASURES/CONTROLS  |
|---|--|---|
|   | 15. Struck by (pressurized water stream)   | 15. Proper instruction on safe use of pressure washers will be conducted; operators will not fix the hand trigger in the open position such that if the wand were left unattended, water would spray from the tip; all pressure washers will be equipped with a deadman switch.   |
|   | 16. Excavation   | 16. All underground utilities will be identified and dig safe numbers will be logged; any excavation four feet and deeper will be monitored for oxygen, combustible gases, and toxic atmospheres prior to personnel entry. Foster Wheeler and USACE excavation procedures will be followed; excavated areas will be barricaded to prevent field personnel from falling into the open area; protective systems (sloping, benching or shoring) to prevent trench/excavation cave-in will be affected in excavations greater than five feet in depth, or if deemed necessary by a competent person; all trenching/excavation will be in accordance with the provisions of 29 CFR 1926 Subpart P; smoking or open flames will not be allowed near work areas, if open flames must be used, procedures outlined in the SHSP for hot work will be followed. |
| EQUIPMENT USED  | INSPECTION REQUIREMENTS  | TRAINING REQUIREMENTS   |
| <ol style="list-style-type: none"> <li>1. Backhoe, Excavator</li> <li>2. Level C PPE</li> <li>3. First Aid Kits</li> <li>4. Portable Eyewash</li> <li>5. Fire Extinguishers</li> <li>6. Pressure Washer</li> <li>7. Monitoring Equipment (CGI, PID/FID, miniRAM)</li> </ol> | <ol style="list-style-type: none"> <li>1. Monthly inspections will be performed on fire extinguishers.</li> <li>2. Daily safety and weekly inspections will be performed on first aid kits.</li> <li>3. Initial inspections will be performed on heavy equipment prior to each use.</li> <li>4. Portable eye wash will be inspected monthly.</li> <li>5. Pressure washers will be inspected prior to each use.</li> <li>6. Monitoring equipment will be calibrated daily (Pre and Post)</li> </ol> | <ol style="list-style-type: none"> <li>1. Personnel have read and comply with SHSP</li> <li>2. Site specific training</li> <li>3. Qualified operators will be used for heavy equipment operation</li> <li>4. Instruct personnel on proper use of fire extinguishers</li> <li>5. At least 2 individuals on-site will have current CPR and First aid training</li> </ol>  |

## ACTIVITY HAZARD ANALYSIS

Project: SITE 6 NAWC WARMINSTER  
 Activity: TASK 4 - BACKFILL/TOPSOIL/SEED

Location: WARMINSTER, PA

| MAJOR STEPS  | POTENTIAL HAZARDS   | PROTECTIVE MEASURES/CONTROLS   |
|--|---|--|
| 1. Mobilization of equipment and supplies (Hazards and Controls 1-8 apply)   | 1. Back Injuries  | 1. Site personnel will be instructed on proper lifting techniques; Mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available, Instruct personnel on proper lifting techniques.   |
| 2. Backfill Excavation (Hazards and Controls 3, 6, 7 and 8 apply)  | 2. Slips/Trips/Falls  | 2. Maintain work areas safe and orderly; unloading areas should be on even terrain; mark and repair if possible tripping hazards.  |
| 3. Replace topsoil and seed (Hazards and Controls 1, 2, 3, 6, 7 and 8 apply)                                       | 3. Vehicular Traffic  | 3. Spotters will be used when backing up trucks, heavy equipment and when moving equipment   |
|  | 4. Overhead Hazards   | 4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1  |
|  | 5. Dropped Objects  | 5. Steel toe boots meeting ANSI Standard Z41 will be worn  |
|  | 6. Noise  | 6. Hearing protection will be worn with a noise reduction rating capable of maintaining personal exposure below 85 dBA (ear muffs or plugs); SHSO will determine the need for hearing protection; all equipment will be equipped with manufacturer's required mufflers   |
|  | 7. Eye Injuries   | 7. Safety glasses meeting ANSI Standard Z87 will be worn during backfilling operation  |
|  | 8. Heavy Equipment (rollovers, overhead hazards, spills, struck by or against)  | 8. Equipment will have rollover protective structures and seat belts; operators shall wear seat belts when operating equipment; do not operate equipment on grades which exceed manufacturer's recommendations; equipment will have guards, canopies or grills to protect from flying objects; ground personnel will stay clear of all suspended loads; all slings chains and ropes will be rated for the load in which it is expected to lift; spills and absorbent materials will be readily available; drip pans, polyethylene sheeting or other means will be used for secondary containment; eye contact with operators will be made before approaching equipment; equipment will not be approached on blind sides; avoid equipment swing areas; know hand signals; all equipment will be equipped with backup alarms |
|  | 9. Fire   | 9. ABC type fire extinguishers shall be readily available; No smoking in work area   |
|  | 10. Spills  | 10. Spill and absorbent materials will be readily available  |
| EQUIPMENT USED   | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS  |
| 1. Backhoe/Front-end Loader<br>2. Level D PPE<br>3. First Aid Kits<br>4. Portable Eyewash<br>5. Fire Extinguishers | 1. Monthly inspections will be performed on fire extinguishers.<br>2. Daily safety and weekly inspections will be performed on first aid kits.<br>3. Initial inspections will be performed on heavy equipment prior to each use<br>4. Portable eye wash will be inspected monthly | 1. Personnel have read and comply with SHSP<br>2. Site specific training<br>3. Qualified operators will be used for heavy equipment operation<br>4. Instruct personnel on proper use of fire extinguishers<br>5. At least 2 individuals on-site will have current CPR and First aid training   |

## ACTIVITY HAZARD ANALYSIS

| Project: <u>SITE 6 NAWC WARMINSTER</u><br>Activity: <u>TASK 5 - TREE CUTTING AND CHIPPING</u>                               |   | Location: <u>WARMINSTER, PA</u>  |
|---|---|--|
| MAJOR STEPS   | POTENTIAL HAZARDS   | PROTECTIVE MEASURES/CONTROLS   |
| 1. Tree cutting with chain saw (Hazards 1-8 apply)  | 1 Eye Injury  | 1. Wear ANSI Z87 safety glasses and a metal window guard on hard hat for chainsaw operation  |
| 2. Chipping wood from trees (Hazards 1-7 and 9 apply)   | 2. Slips/Trips/falls  | 2. Maintain work area safe and orderly; mark or repair any known hazards.  |
|   | 3 Overhead Hazards  | 3. ANSI approved hard hats must be worn.   |
|   | 4. Dropped Objects  | 4. Steel-toe boots meeting ANSI Standard Z41 will be worn.   |
|   | 5. Noise  | 5. Hearing protection will be worn to keep personal exposure below 85 dBA.   |
|   | 6. Fire   | 6. ABC type extinguisher will be readily available, no smoking in work area, shut off engine while fueling equipment.  |
|   | 7. Spills   | 7. Spill and absorbent material will be readily available.   |
|   | 8 Trauma injury from contacting chainsaw  | 8. Chaps and leather gloves will be worn, no cutting above shoulder height, ensure 360° safe working radius, ensure proper chain brake operation.                                  |
|   | 9 Caught by feeder/cutting blades   | 9 Ensure all safety devices are working properly, keep body/extremities out of feeder area, feed trunk first into feeder.  |
| EQUIPMENT USED  | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS  |
| 1. Chainsaws<br>2. Chipper<br>3. First aid kit<br>4. Portable eyewash<br>5. Fire extinguisher<br>6. Level D with proper PPE | 1. Monthly inspections will be performed on fire extinguishers and eyewash<br>2. Weekly inspections of first aid kits.<br>3. Inspect tools and equipment prior to use | 1 Personnel have read and comply with HASP<br>2 Site specific training<br>3. Qualified operators for chainsaw/chipper<br>4. Instruct personnel on proper use of fire extinguishers |

**APPENDIX D**  
**PPE SELECTION FORM**

