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May 2, 1996

VIA MESSENGER DELIVERY

Mr. Edward Hanlon
On-Scene Coordinator
U.S. EPA Region V - SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: **Dutch Boy Site**

Dear Mr. Hanlon:

I am writing with respect to U.S. EPA's CERCLA Section 106 Order issued to NL Industries, Inc. with respect to the above site. Under the Order, and the modified schedule adopted by U.S. EPA, there are several items that NL is obligated to address by May 2, 1996. I am writing to advise you of NL's compliance with the Order with respect to the May 2, 1996 deadline and to provide certain required documentation.

First, enclosed are a draft work plan and draft health and safety plan prepared by Environ. These are the only technical documents required to be submitted by May 2, 1996.

Second, I am writing with respect to NL's efforts to obtain access to the properties surrounding the **Dutch Boy Site**. While NL has not yet obtained the agreement of any property owner to permit NL's contractors access for the purpose of obtaining surface soil samples, NL has undertaking the following efforts to obtain such access:

a. NL immediately requested from U.S. EPA a listing of the property owners surrounding the **Dutch Boy Site**. Several days after the request, NL learned from U.S. EPA that the Agency does not have in its possession the names and addresses of the neighboring property owners. NL had assumed that the Agency would have such information.

b. Immediately upon learning that the Agency did not possess the above information, NL's counsel contacted an investigator and requested that he promptly obtain the names and addresses of the present owners of the properties surrounding the **Dutch Boy Site**.

c. The investigator observed that there would be no method for immediately identifying the property owners in any available publication or on-line. Accordingly, the investigator immediately ordered a real estate search in the relevant area. A title search firm was retained by NL, at considerable expense, and such title search firm has been directed to obtain the necessary information as soon as possible. Unfortunately, while an initial report has been received, the addresses are not yet available due to no fault of NL. Real estate tax records must now be searched to identify the present landowners.

d. NL has prepared an "Access Agreement" and cover letter explaining the need for access, and is prepared to forward these documents to the owners of the relevant properties as soon as the real estate information is received. NL will forward these documents to the landowners via Federal Express and will enclose return envelopes for the return of the executed access agreements.

e. NL reasonably believes it will not be able to obtain access to the relevant properties for several more weeks--despite its due diligence in seeking to obtain such access. Assuming the landowners are cooperative, NL hopes to have signed access agreements by May 20, 1996.

f. If it appears that NL will not be able to obtain access to any property by May 20, 1996, despite NL's best efforts to obtain such access, NL will contact U.S. EPA as soon as this information is known so that U.S. EPA can take steps to secure access under the Order.

NL believes it has complied with the May 2, 1996 deadlines under the Order and looks forward to receiving U.S. EPA's comments on the technical reports.

Very truly yours,

Reed S. Oslan

Encls.
cc: Christine M Liszewski, Esq. (via Messenger Delivery w/encls.)
Marcus Martin, Esq. (w/o encls.)

DRAFT
REMOVAL ACTION WORK PLAN
DUTCH BOY SITE
CHICAGO, ILLINOIS

DRAFT
REMOVAL ACTION WORK PLAN
DUTCH BOY SITE
CHICAGO, ILLINOIS

Prepared for
NL Industries, Inc.

Prepared by
ENVIRON Corporation
Arlington, Virginia

May 1, 1996

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Appendix A: Health and Safety Plan

I. INTRODUCTION

On March 26, 1996, the United States Environmental Protection Agency (USEPA) issued to NL Industries, Inc. (NL) a unilateral Administrative Order (Order) under Section 106 of the Comprehensive Environmental Response Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA). The Order pertains to the property located at 12000 to 12054 South Peoria Street and 901 to 935 West 120th Street in Chicago, Illinois (the "Dutch Boy Site" or the "Site"). The Order requires NL to investigate Site related contamination, and to conduct appropriate removal action activities to abate what USEPA has concluded is an imminent and substantial endangerment to public health, welfare, or the environment that may be presented by the actual or threatened release of hazardous substances at or from the Site. Subsequent to receipt of the Order, NL retained ENVIRON International Corporation (ENVIRON), a division of APBI's Environmental Sciences Group, to implement the removal action requirements specified in the Order.

The scope of work to be performed is specified in Section V.3 of the Order. Section V.3.1 of the Order requires submittal of a draft Work Plan for USEPA approval for performing the removal activities set forth in the Order. Furthermore, Section V.3.2 of the Order requires submittal of a draft Health and Safety Plan for USEPA approval for performing these removal activities. This draft Removal Action Work Plan (RAWP) is submitted by ENVIRON on behalf of NL, consistent with Sections V.3.1 and V.3.2 of the Order. This draft RAWP comprises the following major elements specified in Section V.3 of the Order:

- Site Security Plan
- Sampling and Analysis Plan
- Risk Management Plan.

In addition, requirements for Site health and safety, reporting, recordkeeping, and a preliminary project schedule are included.

The draft RAWP is organized as follows:

- Chapter II. Program Management. This chapter includes an identification and summary of the responsibilities of the Contractor and Project Coordinator as defined in the Order, provides an overview of the Site Health and Safety Plan, and

discusses document retention requirements specified in the Order.

- Chapter III. Scope of Work. This chapter includes a summary of the primary elements of the RAWP as specified in the Order, the intended approach for their implementation, and a summary of reporting requirements.

- Chapter IV. Schedule. This chapter includes a projected schedule for implementation of the RAWP.

II. PROGRAM ADMINISTRATION

A. Contractor/Project Coordinator

ENVIRON will be directly responsible for the overall implementation and timely completion of the RAWP consistent with the requirements of the Order. In this role, ENVIRON will have staff on-site at all times when removal activities are taking place. ENVIRON on-site staff will maintain log books to record general observations, recognition and resolution of problems or unanticipated issues, and subcontractor performance.

Ranjit Machado, P.E. of ENVIRON, the designated Project Coordinator, will manage and coordinate all aspects of the Site evaluation activities, in conjunction with the USEPA On-Scene Coordinator, Edward Hanlon.

B. Health and Safety

Appropriate health and safety procedures will be implemented for all on-site activities described in this work plan. A detailed Health and Safety Plan has been developed by ENVIRON and is provided as Appendix A. The Health and Safety Plan complies with the following regulations:

- U.S. Department of Labor, *Occupational Safety and Health Standards for Construction* (29 CFR 1926).
- U.S. Department of Labor, *Occupational Safety and Health Standards for General Industry* (29 CFR 1910).
- U.S. Department of Labor, *Recording and Reporting Occupational Injuries and Illnesses* (29 CFR 1904).
- U.S. Department of Labor, *OSHA Hazardous Waste Operations and Emergency Response: Final Rules* (29 CFR 1910.120).

- U.S. Department of Labor, *OSHA Hazard Communication Standard* (29 CFR 1910.1200).

- U.S. Department of Labor, *OSHA Lead in Construction Standard* (29 CFR 1926.62).

Applicability of the Health and Safety Plan will extend to all personnel and visitors to the Site. All personnel and visitors to the Site entering designated areas will be responsible for reading and complying with the Health and Safety Plan and will be required to sign an agreement to comply with the Health and Safety Plan. Subcontractors ultimately will be responsible for the health and safety of their own personnel and representatives and will be required to furnish their own health and safety plan. Subcontractors' health and safety plans, at a minimum, will be required to meet the requirements of the Site Health and Safety Plan provided herein. ENVIRON will provide independent oversight to verify compliance with the Health and Safety Plan and will collect and maintain records related to health and safety matters.

C. Monthly Progress Reports

ENVIRON will provide USEPA with monthly progress reports beginning thirty days after USEPA approval of this work plan. These reports will contain a summary of all work performed, any problems encountered, and any analytical data received during the reporting period. In addition the reports will include a summary of developments expected during the next reporting period, a schedule of work to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

D. Document Retention

All project documentation including field logbooks, visitor logs, analytical data packages, health and safety records, monthly progress reports, waste manifests, regulatory correspondence, work plans and reports will be retained for a minimum of six years. Documents and information retained under this section will be provided at the written request of USEPA. At the expiration of the six year period and at least sixty days prior to the destruction of any document or information retained under this section, USEPA will be notified that such documents and information are available for inspection. Originals or copies of such documents and information will be provided to USEPA upon request.

III. SCOPE OF WORK

A. Site Security Plan

As required by the Order, ENVIRON will develop and submit to USEPA a detailed plan for Site security to mitigate trespassing by unauthorized persons. The Site Security Plan (SSP) will include the installation of a perimeter fence with a locking gate. Signs warning that hazardous materials are present at the Site will also be posted. The fence will serve as the primary barrier against Site trespassing during periods of no Site activity. Fencing specifications will be described in the SSP. If necessary, the plan will also include supplemental security measures to be implemented during periods of Site activity. The SSP will also include provision for documentation of all Site visitors and any other perimeter security matters throughout the implementation of removal activities at the Site.

As specified in the RAWP schedule (Chapter IV), the SSP will be developed and submitted to USEPA within one week after receipt of USEPA approval of the RAWP. Implementation of the SSP will be completed within three weeks after receipt of USEPA approval of the SSP.

B. Sampling and Analysis Plan

A detailed sampling and analysis plan (SAP) will be developed in accordance with the requirements outlined in the Order. Specifically, the SAP will be designed to determine the Site related Extent of Contamination (EOC) by delineating the vertical and horizontal extent of on-site and off-site soil contamination exceeding the preliminary cleanup goal of 1,400 ppm.

The SAP will specify the number and location of soil borings to be installed at the Site (and off-site areas), and the analyses to be conducted on samples collected. To design the SAP, ENVIRON will compile and review the following information:

- Reports on previous sampling and analysis conducted at the Site including:

  Ecology & Environment, Inc., *Site Assessment Report for International Harvester/Dutch Boy Site*, August 1995.

  Simon Hydro-Search, Inc., *Environmental Assessment Report, 120th and Peoria Streets, Chicago, Illinois*, November, 1993.

Toxcon Engineering Company, *Analytical Results, Phase III - Supplemental Site Investigation, Dutch Boy Paint*, August 1988.

Toxcon Engineering Company, *Analytical Results, Phase III - Site Investigation, Dutch Boy Paint Plant Site*, September 1987.

Professional Service Industries, Inc., *Subsurface Exploration, 120th Street and Peoria Avenue*, July 1987.

Toxcon Engineering Company, *Investigation of the Former Dutch Boy Site, 120th and Peoria Streets*, 1987.

Envirodyne Engineers, Inc., *Immediate Removal Project for Dutch Boy Paint Co./NL White Lead Plant, Chicago, Illinois*, July 1986

- Historical Site information regarding the nature and configuration of lead emissions sources, location of processing operations, material stockpiles and storage areas, storage tanks and pipelines, and any other potentially useful information available.

- Historical information regarding activities conducted at the Site including lead operations, disposal practices, and previous removal/demolition activities. Historical records and depositional testimony will be the primary source of such information.

- Physical Site characteristics including local windrose data, topography, geology and hydrogeology, and the presence of on-site structures, pavement, and other significant physical characteristics.

The SAP will be developed based on a review of Site information and an evaluation of the likely area of lead impact that may have resulted from Site activities. Ancillary activities (e.g., surveying, management of drill cuttings and other investigation-derived waste) will also be detailed in the SAP.

All sampling and analyses will be conducted in accordance with a detailed Quality Assurance Project Plan (QAPP) that will be submitted as part of the SAP. The QAPP will

describe the policy, organization, and functional activities and the data quality objectives and measures necessary to achieve adequate data for use in development of the Risk Management Plan as described below. The QAPP will be consistent with the guidance provided in "*Interim Final Quality Assurance/Quality Control Guidance for Removal Activities: Sampling, QA/QC Plan and Data Validation Procedures,*" dated April 1990.

ENVIRON anticipates that a comprehensive SAP, incorporating the above components can be developed and submitted to USEPA by June 17, 1996.

Upon receipt of USEPA approval, assuming access to sampling areas is obtained, ENVIRON will implement the SAP and will prepare and submit to USEPA an EOC report summarizing the actions taken during this event. The report will include a detailed description of the review of information described previously and present a summary of relevant Site history, the results of previous Site investigations, and a detailed description of the Site's physical characteristics. The report will describe in detail all field activities and present all sampling results conducted as part of the SAP. The report will include figures showing the horizontal and vertical extent of lead in on-site and off-site soils above the preliminary cleanup goal of 1,400 ppm.

ENVIRON projects that implementation of the SAP and submission of the EOC report can be completed within approximately nine weeks after USEPA issues approval of the SAP. This time frame consists of approximately three weeks to retain subcontractors, schedule and mobilize field crews, complete utility markout, and implement the field sampling program. The schedule assumes a standard 28-day (four week) laboratory turnaround time. Upon receipt of analytical data from the laboratory, at least two weeks will be required for data analysis and validation, and to develop an EOC report consistent with the requirements of the Order.

Due to the urban setting of the Site, it is possible that background lead concentrations in the Site vicinity may be elevated. The available historical data, although limited, do not indicate this to be the case. The SAP will be designed to evaluate whether background lead concentrations may be elevated, which will include a consideration of the spatial distribution of lead around the Site. If the proposed sampling indicates that background lead levels are elevated, a sampling plan will be developed to determine a representative background lead level.

C. Risk Management Plan

Upon USEPA approval of the EOC report, ENVIRON will develop and submit a Risk Management Plan (RMP) to address the risks associated with lead-contaminated soils on-site and off-site. The RMP will include the following major elements:

- Site Description. A detailed description of the Site and surrounding areas will be

included in this section of the RMP. The Site description will include a summary of the surrounding land use, identification of potential receptors, topography, geology and hydrogeology, and climatic data.

- Extent of Contamination Summary. A summary of the findings of the SAP and EOC report will be included in this section. Summary figures identifying areas exceeding cleanup goals will be developed and included.

- Identification and Screening of Appropriate Removal Action Alternatives. Various removal action alternatives will be considered for implementation at the Site. In this section, a set of alternatives that are adequately protective of human health will be identified and screened based on consideration of their feasibility and ease of implementation at the Site. A comparison of the screened feasible alternatives will then be made based on their respective costs. Various alternatives will be evaluated in the RMP that may not include removal of soils exceeding an average of 1,400 ppm, but achieve protection by other means such as limiting access to soils by institutional controls or deed restrictions, consolidation and capping, or paving. Risk-based methodologies will be used to ensure that the recommended alternatives are adequately protective.

- Removal Action Selection. Based on the screening analysis described above, an appropriate alternative will be selected for implementation at the Site that is cost-effective and protective of human health and the environment.

- Implementation Schedule. Implementation of the RMP will be dependent on the results of the EOC, ultimate cleanup objectives, and the approved alternative to be implemented at the Site. A detailed implementation schedule will be developed and submitted as part of the RMP.

ENVIRON anticipates completion of the RMP eight weeks after USEPA approval of the EOC report.

D. Final Report

At the conclusion of Site activities undertaken pursuant to Sections A-C above, ENVIRON will prepare a final report summarizing the actions taken to comply with the Order.

The report will identify the Site, summarize the findings of the SAP, and discuss the selection of an appropriate remedy for the Site as detailed in the RMP. The report will also present a chronology of events, and description of all actions performed under the Order; provide a listing of the resources committed to perform the work; identify all items that affected actions undertaken to comply with the Order; and include a discussion of problem resolution. In addition, a list of quantities and types of materials removed from the Site will be provided along with a discussion of the removal and disposal options considered, and ultimate destination of the materials. Analytical results from all sampling and analyses performed, and all relevant paperwork accrued during the action (manifests, contracts, permits, bills, and invoices) will be included.

The final report will include an affidavit from the person who directed the report preparation. The affidavit will certify under penalty of law that, based on personal knowledge and appropriate inquiries of all other persons involved in the preparation of the report, the information submitted is true, accurate, and complete to the best of the affiant's knowledge and belief. The report will be submitted to USEPA within sixty calendar days of completion of the work required under the Order.

IV. SCHEDULE

A schedule for implementation of the removal activities to be carried out under the Order is provided in Table 1. Because implementation of the removal activities described herein is dependent on USEPA approval of the RAWP, the schedule has been developed using such approval date as a starting point. At various points in the RAWP process, USEPA approval of submittals (viz., Site Security Plan, Sampling and Analysis Plan, Extent of Contamination Report, and Risk Management Plan) will also be required. Where appropriate, the schedule projects the anticipated time frames that will be required for such approvals to be issued. Monthly progress reports will be issued on the last business day of each month following USEPA approval of the RAWP.

It should be noted that the available historical data indicate a very limited area of lead impact as a result of Site activities. The actual extent of contamination and need for further sampling can only be determined following implementation of the SAP. Thus, no provision has been made for further sampling beyond the initial sampling to be prescribed in the SAP. Additionally, the proposed schedule does not account for any delays caused by demolition activities to be undertaken at the Site by the City of Chicago. Because of Site access issues and logistics, such activities should be undertaken prior to implementation of Site activities included in this RAWP. Finally, the schedule is contingent on obtaining the necessary access agreements from appropriate land owners in implementing the SAP.

TABLE 1 **Preliminary Schedule of Events** **Dutch Boy Site** **Chicago, Illinois**	
Task/Event	Date
Develop and Submit Draft Removal Action Work Plan (RAWP)	5/2/96
USEPA Issues Comments on Draft RAWP	5/9/96
Revise and Resubmit RAWP (One Week from Receipt of USEPA Comments)	5/16/96
USEPA Issues Approval of RAWP	5/23/96
Develop and Submit Site Security Plan (SSP) (One Week from Receipt of RAWP Approval)	5/30/96
USEPA Issues Approval of SSP*	6/6/96
Complete Implementation of SSP (Three Weeks from Receipt of SSP Approval)	6/27/96
Develop and Submit Site Sampling and Analysis Plan (SAP)	6/17/96
USEPA Issues Comments on SAP	7/1/96
Revise and Resubmit SAP (Two Weeks from Receipt of USEPA Comments)	7/15/96
USEPA Approves Revised SAP	7/22/96
Complete Implementation of SAP and Submit Report on Extent of Contamination (EOC) (Nine Weeks from Receipt of SAP Approval)	9/23/96
USEPA Issues Comments on EOC Report	10/7/96
Revise and Resubmit EOC Report (Two Weeks from Receipt of USEPA Comments)	10/21/96
USEPA Approves Revised EOC Report	10/28/96
Develop and Submit Risk Management Plan (RMP) (Eight Weeks from Receipt of EOC Report Approval)	12/23/96
USEPA Issues Comments on RMP	1/13/97

TABLE 1 Preliminary Schedule of Events Dutch Boy Site Chicago, Illinois	
Task/Event	Date
Revise and Resubmit RMP (Two Weeks from Receipt of USEPA Comments)	1/27/97
USEPA Approves Revised RMP	2/2/97
* All subsequent dates are contingent upon obtaining appropriate access agreements.	

APPENDIX A
HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN
DUTCH BOY SITE
CHICAGO, ILLINOIS

Prepared for

NL Industries, Inc.

Prepared by

ENVIRON Corporation
Arlington, Virginia

May 1, 1996

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1.0 INTRODUCTION

1.1 Site Description

The Dutch Boy Site ("the Site") is located at 12042 South Peoria Street in Chicago, Illinois (Cook County) (Figure 1-1). The Site occupies an abandoned parcel of land approximately 5.2 acres in size, and is surrounded by industrial and warehouse buildings to the north and south, and vacant or abandoned lots to the east and west. The Illinois Central Gulf Railroad borders the Site to the south, and the Site is bounded on the north and east by 120th and Peoria Streets, respectively (Figure 1-2). The Little Calumet River is located approximately 1.2 miles south of the Site, flows east, and eventually drains into Lake Michigan, located approximately 7.5 miles northeast of the Site. Land surface appears to slope gently to the south/southeast at the Site toward the Little Calumet River.

1.2 Site History

The Site was owned and operated by NL Industries, Inc. (NL), and was used as a lead-based paint manufacturing facility from 1937 until 1976. Ownership of the facility has been transferred several times in the last twenty years with ELT, Inc., Goodwill Industries of Chicago, ARTRA Group, Inc., John Heckens, and M & T Enterprises, Inc. (M&T) being past owners, and LaVon Tarr Enterprises being the present owner.

The last owner to continue lead-based paint operations at the Site was ARTRA Group, Inc. in 1980; the Site has been inactive since that time. In 1983, wrecking and salvaging operations began at the Site by the Illinois Department of Public Health (IDPH). In 1986, the Illinois Environmental Protection Agency ("IEPA") initiated an immediate removal at the Site, which included the removal of surficial solids that were either suspected or known to contain lead and/or asbestos. IEPA also removed the production equipment and debris associated with the manufacturing processes. IEPA also sampled and analyzed Site soils for lead contamination. Several other investigations have been conducted at the Site since 1986. Table 1-1 lists selected documents that provide additional information about Site conditions

In March of 1996, USEPA issued a unilateral Administrative Order (Order) under Section 106 of CERCLA. The order mandates various removal action activities to be implemented at the Site.

1.3 Scope and Organization of the Health and Safety Plan

1.3.1 Scope and Applicability

ENVIRON has been retained by NL Industries (NL) to serve as Contractor for the Site as defined in the Order. This Health and Safety Plan (HASP) has been prepared to address future anticipated Site activities to be conducted by ENVIRON and its subcontractors on behalf of NL at the Site. ENVIRON views the implementation of a site-specific HASP as a critical management element necessary to the success of the future activities at the Site. The safety, health, and well-being of Site personnel and the community are the prime objectives of the program. Site operations will be performed in such a manner as to minimize the possibility of fire, explosion, or any unplanned or sudden release of contaminants into the environment which could adversely affect local receptors. The Dutch Boy Site HASP is intended to be in compliance with all applicable state, federal and local regulations and is consistent with ENVIRON's commitment to personnel health and safety.

The HASP identifies potential hazards associated with the activities at the Site, establishes the minimum procedural and equipment requirements to protect on-site personnel from potential hazards, and requires that on-site activities are conducted in a manner consistent with both accepted professional practice and applicable regulations listed in Section 3.0. It describes measures to minimize accidents and injuries that may occur during normal daily activities or during adverse conditions.

The HASP is based upon currently available information regarding Site conditions. Operating conditions can be expected to change as the work progresses, requiring some modification of the HASP. Any permanent modifications to the HASP, including changes necessary to correct any health and safety problems at the Site, will be made only with the approval of the Site Coordinator (SC) and Chairperson of ENVIRON's Health and Safety Technical Committee (HSTC), after an opportunity for review by USEPA.

Applicability of this HASP extends to all personnel and visitors to the Site. However, ENVIRON's subcontractors are ultimately responsible for the health and safety of their personnel and representatives, and are required to furnish their own HASP. All personnel and visitors entering on-site areas other than the Support Zone are responsible for reading and complying with the HASP, and must sign an agreement to comply with the requirements of the HASP.

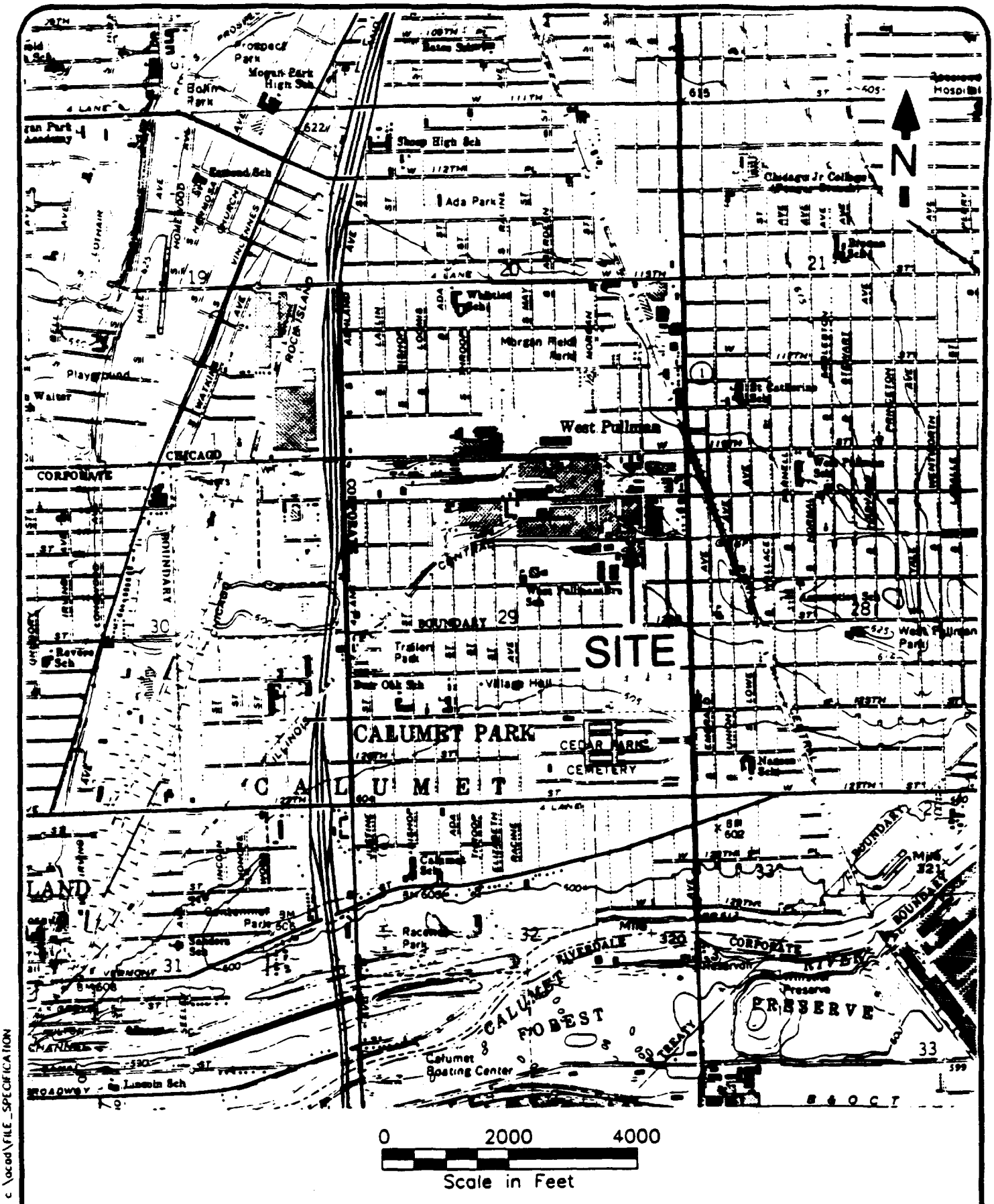
1.3.2 Organization

This HASP contains information applicable to the entire Site, and is organized into the following Sections:

Section 1:	Introduction
Section 2:	Identification of key health and safety personnel
Section 3:	Applicable standards
Section 4:	Hazard assessment
Section 5:	Site control measures
Section 6:	Personnel training requirements
Section 7:	Medical surveillance
Section 8:	Personal protective equipment
Section 9:	Work activity air monitoring/sampling procedures;
Section 10:	Equipment and personnel decontamination;
Section 11:	On-site emergency response plan; and
Section 12:	Health and Safety Plan Field Team Signatures.

TABLE 1-1
Selected Reports Containing Information Relevant to Site Environmental Conditions

Date	Report Title	Author
August, 1995	Site Assessment for International Harvester/Dutch Boy Site	Ecology and Environment, Inc.
January, 1994	Cost Estimate Summary with Supporting Data Former Dutch Boy Paint Plant Site	Simon Hydro-Search, Inc.
November, 1993	Environmental Assessment Report, 120th and Peoria Streets, Chicago, Illinois	Simon Hydro-Search, Inc.
August, 1988	Analytical Results, Phase III - Supplemental Site Investigation, Dutch Boy Paint	Toxcon Engineering Company
June, 1988	Possible Remedial Action Plans, Former Dutch Boy Paint Plant Site, 120th and Peoria Streets	Toxcon Engineering Company
September, 1987	Analytical Results, Phase III - Site Investigation Dutch Boy Paint Plant Site	Toxcon Engineering Company
July, 1987	Subsurface Exploration, 120th Street and Peoria Avenue	Professional Services Industries, Inc.
June, 1987	Phase III Site Investigation Plan for the Dutch Boy Paint Plant Site Located at 120th and Peoria Streets	Toxcon Engineering Company
1987	Investigation of the Former Dutch Boy Site 120th and Peoria Streets	Toxcon Engineering Company
September, 1986	An Alternative Remedial Investigation/Remedial Action Plan for the Plant Site at 120th and Peoria Streets	Toxcon Engineering Company
July, 1986	Immediate Removal Project for Dutch Boy Paint Co./NL White Lead Plant	Envirodyne Engineers, Inc.



SOURCE: USGS 7.5 MINUTE (TOPOGRAPHIC) SERIES; BLUE ISLAND, ILLINOIS QUADRANGLE

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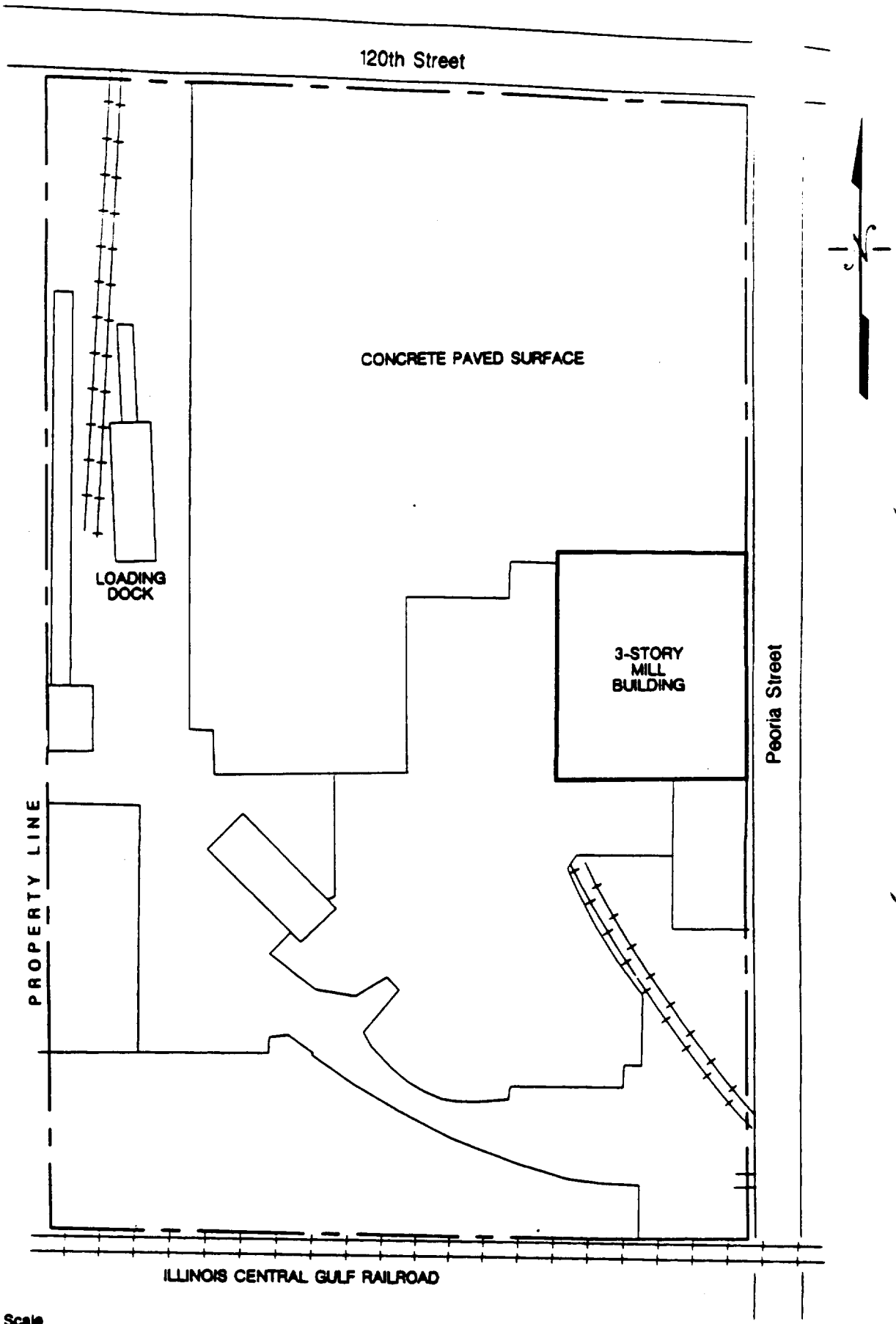
ENVIRON A Division of APSI Environmental Sciences Group, Inc.	SITE LOCATION MAP DUTCH BOY SITE CHICAGO, ILLINOIS	Figure 1-1



NOTE: Not to Scale

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ENVIRON
A Division of APSI
Environmental Sciences Group, Inc.

DUTCH BOY SITE LAYOUT
CHICAGO, ILLINOIS

Figure
1-2

2.0 IDENTIFICATION OF KEY HEALTH AND SAFETY PERSONNEL

2.1 Project Organization

NL has retained ENVIRON Corporation (ENVIRON) to serve as the Project Coordinator for the Site. ENVIRON is responsible for overseeing activities conducted by ENVIRON personnel and ENVIRON's subcontractors at the Site. ENVIRON is also responsible for oversight of compliance with this HASP in the field by ENVIRON personnel. ENVIRON subcontractors may plan, manage, and carry out activities at the Site, including environmental investigation and remediation tasks, and will provide their own health and safety officers. As part of ENVIRON's role as Site Coordinator, ENVIRON will ensure that all subcontractors and Site workers comply with this HASP.

2.2 ENVIRON Personnel

Responsibilities and assigned functions of key project team members are described below.

2.2.1 Program Coordinator

The ENVIRON Program Coordinator (PC), assisted by a supervisory staff, will oversee project activities. ENVIRON's PC is responsible for monitoring the work effort, schedule, costs and communication. The PC will also provide the focal point for communications between NL, the USEPA, the IEPA, and the project staff. This liaison activity will provide a clear line of communication between all parties to minimize the chance for misconceptions concerning any aspect of the project. The ENVIRON PC will report to NL, and will coordinate any support required from ENVIRON and its subcontractors. He/she will ensure that the activities of all Site personnel comply with the approved work plans and will recommend or provide disciplinary action, as appropriate, if noncompliances occur.

The ENVIRON PC is Allan DeLorme.

2.2.2 Corporate Health and Safety Officer

The ENVIRON Health and Safety Technical Committee (HSTC) will oversee all issues related to health and safety at the Site. Any and all recommended revisions or changes in the HASP will be reviewed and approved by the Chairperson of the HSTC.

The Chairperson of the ENVIRON HSTC is Mark Katchen.

2.2.3 Site Coordinator

The ENVIRON Site Coordinator (SC) is responsible for overseeing day-to-day Site activities performed by ENVIRON and its subcontractors. The ENVIRON SC's principal charge will be to coordinate and document all on-site work necessary to fulfill approved work plans. The ENVIRON SC, with the ENVIRON Site Health and Safety Officer (SHSO), will conduct daily briefing meetings as necessary to review work progress or activities planned for the day.

In the event of an emergency, the ENVIRON SC will also function as the Site Emergency Response Coordinator (SERC). The SC/SERC will be available for counsel and will implement and coordinate emergency response procedures described in Section 11 of the HASP. The ENVIRON SC/SERC is also responsible for notifying and assisting the SHSO in the event of an emergency. In the event of a chemical release or spill, the ENVIRON SC/SERC will act as the Spill Coordinator and will oversee implementation of the spill response activities described in Section 11.7.2.

Prior to the initiation of new Site activities, the ENVIRON SC will coordinate communications with off-site emergency response officials as necessary to provide new information on site-specific hazards and potential types of emergencies that could occur during Site activities.

The ENVIRON SC is Steve Dielman.

2.2.4 Site Health and Safety Officer

The ENVIRON Site Health and Safety Officer (SHSO) reports to the PC and CHSO. ENVIRON subcontractors will provide their own SHSOs. One or more SHSOs will be on-site whenever operations within the Exclusion Zone are in progress. The SHSOs are responsible for ensuring compliance with all aspects of the health and safety plans which include, but are not limited to, safe work practices, site access controls, work safety zones, proper personal protective equipment, and daily safety briefings. The SHSOs will report all Site-related injuries to the Chairperson of the HSTC and to any other necessary authorities, review planned Site activities and implement safety procedures necessary to complete work safely, assist in on-site emergencies, and act as technical liaison to regulatory agency personnel on matters related to occupational safety and health.

The SHSOs will ensure that all Site personnel understand their respective emergency response duties. In the instance of any emergency or non-emergency incidents concerning Site personnel, the SHSO will be contacted and will be responsible for communicating any information regarding Site safety conditions to rescue or emergency personnel. The SHSO will ensure that all activities at the Site comply with the approved HASP.

Any person working on-site has the authority to stop work if any operation threatens the health and safety of on-site workers or the off-site community. In the event that such a situation occurs, the SHSO shall be notified immediately. ENVIRON's SHSO will update the ENVIRON SC on all project-related health and safety issues as they arise.

Each SHSO will be certified in first aid and cardiopulmonary resuscitation (CPR) by the American Red Cross, or equivalent. Typically, the role of SHSO will be filled by the ENVIRON SC.

2.3 Other Personnel

2.3.1 ENVIRON Subcontractor Personnel

ENVIRON's subcontractors, if needed, will plan, manage and carry out activities at the Site, including environmental sampling and remediation tasks. Subcontractors will provide their own HASP which must comply with ENVIRON's HASP. All Subcontractors will also provide a Health and Safety Officer who will assist ENVIRON's SC. The subcontractor Health and Safety Manager will have the opportunity to review and comment on proposed changes to the ENVIRON HASP. The subcontractor Health and Safety Manager will ensure that subcontractor personnel have received appropriate health and safety training and are participating in a medical surveillance program. ENVIRON subcontractors will also provide an SHSO. The subcontractor SHSO will monitor the health and safety practices of subcontractor personnel and will interface with the ENVIRON SHSO.

3.0 APPLICABLE STANDARDS

The methods and procedures prescribed in this HASP are intended to conform with established professional practices and applicable federal, state, and local occupational safety and health protection standards. Regulations which serve as the technical compliance basis for this document are provided as follows:

- U.S. Department of Labor, *Occupational Safety and Health Standards for Construction* (29 CFR 1926).
- U.S. Department of Labor, *Occupational Safety and Health Standards for General Industry* (29 CFR 1910).
- U.S. Department of Labor, *Recording and Reporting Occupational Injuries and Illnesses*, (29 CFR 1904).
- U.S. Department of Labor, *OSHA Hazardous Waste Operations and Emergency Response: Final Rules* (29 CFR 1910.120).
- U.S. Department of Labor, *OSHA Hazard Communication Standard*, (29 CFR 1910.1200).
- U.S. Department of Labor, *OSHA Lead in Construction Standard*, (29 CFR 1926.62).

In addition, certain technical documents were utilized as references in the preparation of this HASP. The citation of these technical documents does not imply compliance with all aspects of the documents. The purpose of these citations is to aid in the interpretation of conflicting issues that may arise during the performance of Site activities. The following documents were referenced in the preparation of this HASP:

- NIOSH/OSHA/USCG/USEPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, (October, 1985).

- U.S. Department of Health and Human Services (DHHS), *NIOSH Sampling and Analytical Methods*, DHHS (NIOSH) Publication 84-100.

- American National Standards Institute (ANSI), *Practices for Respiratory Protection*, Z88.2 (1980).

- ANSI, *Emergency Eyewash and Shower Equipment*, Z358.1 (1981).

- ANSI, *Protective Footwear*, Z41.1 (1983).

- ANSI, *Physical Qualifications for Respiratory Use*, Z88.6 (1984).

- ANSI, *Practice for Occupational and Educational Eye and Face Protection*, Z87.1 (1979).

- ANSI, *Protective Headgear for Industrial Workers - Requirements*, Z89.1 (1986).

4.0 HAZARD ASSESSMENT

4.1 Physical Hazards

This section describes general physical hazards associated with the Site. Specific physical hazards are also associated with each task and area of the Site.

- Noise: Hearing protection will be worn by all personnel operating on or working within the vicinity of heavy equipment and/or when noise is sufficient to interfere with general conversation. This measure will ensure that personnel are not exposed to noise levels approaching or in excess of 90 decibels on the A scale, as provided in 29 CFR 1910.95.

- Confined spaces: ENVIRON personnel will not enter confined spaces, including excavations or trenches.

- Excavations: Entry into excavations will be performed in accordance with 29 CFR 1926.650 through 1926.652.

- Heavy equipment: Personnel in the Exclusion Zone (EZ) will wear high visibility clothing and maintain a constant line of sight with the equipment operators.

- Buried product lines/underground utilities: These will be located to the extent possible prior to initiation of excavation or intrusive work activities.

- Impact hazard (feet): Personnel will wear steel toe/steel shank safety boots meeting the specifications of 29 CFR 1910.136 and ANSI Z41.1. If miscellaneous debris (nails, metal shards, etc.) presents a puncture hazard, metal inserts will be worn inside safety boots.

- Impact hazard (head): Personnel will wear hard hats meeting the specifications of 29 CFR 1910.135 and ANSI Z89.1 whenever in the EZ and when their use is required while in the Contamination Reduction Zone (CRZ) or Support Zone.

- Impact hazard (eye): Personnel will wear safety glasses or safety goggles when not in Level C personal protective equipment (PPE) whenever in the EZ and when their use is required while in the CRZ or Support Zone. Eye protection equipment will meet the requirements of 29 CFR 1910.133 and ANSI Z87.1

- Rough terrain: Personnel will wear safety boots with skid-resistant soles.

- Tripping/falling/slipping: Good housekeeping practices will be maintained. Debris and other items posing a tripping hazard will be removed from work areas, when practicable. Personnel will avoid contact with free standing waters, when practicable.

- Hypothermia/frostbite: Work during cold weather will be performed in accordance with Appendix 1 to the HASP (Hypothermia and Frostbite).

- Heat stress: The Heat Stress Prevention Program, provided in Appendix 2 to this HASP, will be implemented whenever any of the conditions in Section 4 of that Appendix are met.

4.2 Chemical Hazards

The major contaminant to which personnel may be exposed during on-site activities at the Site is lead. Lead has been detected at the Site in surface soils, subsurface soils, and on exposed surfaces of Site buildings. Arsenic has also been detected in Site soils at slightly elevated concentrations.

Asbestos has been detected at low concentrations in Site soils. However, recent removal activities have effectively decreased the asbestos concentrations to less than 1%, the threshold level for asbestos-containing materials (Simon Hydro-Search, 1993). Therefore, it is not expected that ENVIRON personnel will contact any asbestos-containing materials.

In addition to lead, other inorganic and organic compounds have been detected in Site soils, including metals (e.g., chromium, zinc), aromatic hydrocarbons (e.g., pyrene, phenanthrene), and phthalates (e.g., di-n-butyl-phthalate). However, because of their relatively low concentrations, these constituents do not likely represent a significant threat to the

environment or to the health and safety of Site workers. Table 4-1 summarizes the constituents previously detected in Site soils and their maxiumum concentrations.

Toxicological information for selected chemical constituents detected at the Site are provided below:

Lead

Absorption can occur via inhalation or ingestion. It is not well absorbed via skin contact, with the exception of tetraethyl lead. Overexposure can cause central nervous system effects with headache or personality change. High levels can cause acute lead poisoning with abdominal pain, anemia, and in severe cases, encephalopathy. Chronic exposure can cause joint pain, headache, weakness, impotence, depression, and gastrointestinal symptoms. Repeated exposure can cause gout, kidney damage, and brain damage. USEPA has designated lead to be a probable human carcinogen (Group B2). The OSHA-PEL for lead is 0.05 mg/m^3 (TWA). The OSHA-PEL for tetraethyl lead is 0.075 mg/m^3 (TWA).

Arsenic

A metalloid found extensively on the surface of the earth in rocks and ores. It can exist in several valence states, and in both organic and inorganic forms. The various forms differ greatly in their toxic potential. Listed in decreasing order of toxicity they are as follows: arsine > arsenites (+3) > arsenates (+5) > pentavalent organic compounds > arsonium metals (+1) > metallic arsenic (0). Exposure can occur via inhalation, ingestion, or dermal absorption. Overexposure can affect the skin, nervous system, liver, kidney, cardiovascular, and respiratory functions. USEPA has designated arsenic to be a human carcinogen (Group A). The OSHA-PEL is 10 ug/m^3.

Asbestos

Fine, slender, flaxy fibers resistant to fire and most solvents. Absorption can occur via inhalation and ingestion. Exposure to asbestos dust may lead to chronic cough, lung cancer, gastrointestinal cancer of laryngeal cancer. Chronic high exposures may cause asbestosis, asbestos induced fibrosis of the lung tissue. Signs and symptoms of asbestosis include breathlessness, chest pain, cough, finger clubbing and heart problems. Exposure

may also cause malignant mesotheliomas of the lung mesothelium or gastrointestinal mesothelium. Asbestos has been designated by the USEPA to be a human carcinogen (Group A) based on evidence in humans. The OSHA-PEL is 0.2 fibers/cm^3.

4.3 Biological Hazards

Biological hazards, that may be encountered during activities at the Site, include potential exposure to deer ticks, spiders, snakes, bees and small animals, and possible dermal contact with poison oak or poison ivy.

The deer tick is responsible for the transfer of the bacterium that causes Lyme disease in humans. Personnel are encouraged to use a tick repellent (e.g., Skintastic), when not suited out in Level C PPE.

Personnel should avoid contact with rodents and small animals, such as skunks, raccoons and bats, because they may carry the rabies virus.

Several species of spiders may be encountered during on-site activities, including the brown recluse and female black widow spider, which are both known to be poisonous. However, while most spiders are not poisonous, possible allergic reactions to spider bites require the use of appropriate personal protective clothing and avoidance of areas of high spider populations.

To help reduce the possibility of tick and/or spider bites, employees should wear light-colored long-sleeved shirts and long pants that are tucked into boots when not suited out in Level C PPE. This clothing will allow early detection of the presence of ticks and spiders and will reduce direct dermal contact with poison oak. Unnecessary entry into high grasses and shrub areas should be avoided because these areas are more likely to harbor tick, spider and rodent populations, and could contain poison oak or poison ivy.

TABLE 4-1
Summary of Detected Constituents in Site Soils

Constituent	Maximum Concentration (mg/kg)	Author and Year of Report
Metals		
Antimony	53	Ecology and Environment, 1995
Arsenic	27	Ecology and Environment, 1995
Beryllium	1.5	Ecology and Environment, 1995
Chromium	185	Ecology and Environment, 1995
Copper	141	Ecology and Environment, 1995
Lead	50,000	Toxcon Engineering Company, 1987
Mercury	1.3	Ecology and Environment, 1995
Nickel	31	Ecology and Environment, 1995
Selenium	17	Ecology and Environment, 1995
Zinc	692	Ecology and Environment, 1995
Volatile Organic Compounds (VOCs)		
Chloroform	0.0011	Toxcon Engineering Company, 1987
Ethyl Benzene	23	Simon Hydro-Search, 1993
Hexane	0.022	Toxcon Engineering Company, 1987
Methylene Chloride	3	Simon Hydro-Search, 1993
Toluene	0.009	Toxcon Engineering Company, 1987
Total Xylenes	31	Simon Hydro-Search, 1993
Trichlorofluoromethane	0.013	Toxcon Engineering Company, 1987
1,1,2-trichloro-1,2,2-trifluoroethane	0.14	Toxcon Engineering Company, 1987
2,4-dimethyl-3-pentanone	0.34	Toxcon Engineering Company, 1987
2,4-dimethyl-3-pentanol	0.038	Toxcon Engineering Company, 1987
Total TICs[1]	0.099	Toxcon Engineering Company, 1987
Semi-Volatile Organic Compounds (SVOCs)		
Phenanthrene	2.3	Ecology and Environment, 1995
Fluoranthene	3.3	Ecology and Environment, 1995
Pyrene	3.7	Ecology and Environment, 1995
Benzo(a)anthracene	2	Ecology and Environment, 1995
Chrysene	2.1	Ecology and Environment, 1995
Benzo(b)fluoranthene	2.7	Ecology and Environment, 1995
Benzo(k)fluoranthene	1	Ecology and Environment, 1995
Indeno(1,2,3-cd)pyrene	1.4	Ecology and Environment, 1995
Benzo(g,h,i)perylene	1.2	Ecology and Environment, 1995
Benzo(a)pyrene	2.1	Ecology and Environment, 1995
Anthracene	0.6	Ecology and Environment, 1995
Di-n-butyl-phthalate	0.4	Ecology and Environment, 1995
Poly-Chlorinated Biphenyls (PCBs)		
Aroclor-1260	0.52	Ecology and Environment, 1995

Notes:
1: TICs = Tentatively Identified Compounds
Indications of potentially higher concentrations of some constituents may be found in laboratory reports produced for the Illinois EPA. However, the documents detailing the locations and matrices of these samples were unavailable at the time of this report.

5.0 SITE CONTROL MEASURES

5.1 Work Zone Definition

Site work zones will be established to reduce the accidental spread of hazardous substances from contaminated areas to clean areas, to prevent access or exposure to site hazards by unauthorized persons, to protect Site personnel against the hazards present, and to confine work activities and contamination to appropriate areas. Work zones will be delineated for each task based on sampling and monitoring results and potential routes and amount of dispersion in the event of a release. The three general work zones are the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ), and the Support Zone. Within these zones, work activities will occur using appropriate personal protective equipment (PPE) as designated in Section 8 of the HASP.

It is expected that the Support Zone will be located directly within the Site access point located on 120th Street. The boundaries of the Support Zone and other zones may be altered to accomodate Site activities but will at all times be clearly marked. The CRZ will be located between the Support Zone and the EZ. The EZ will include all areas within Site boundaries outside of the CRZ and Support Zone (see Figure 5-1).

5.1.1 Exclusion Zone (EZ)

The EZ is defined as the area where contamination is either known or likely to be present, or where activities will have the potential to cause harm to personnel. The EZ will include any areas designated for material excavation and processing, and the immediate area around remediation activities. During sampling and other activities conducted outside the EZ boundaries, a temporary EZ will be defined for each specific task based upon the presence of contaminants within the area. EZ boundaries may subsequently be altered by the Site Health and Safety Officer (SHSO) based upon new data or observations. The outer boundary of the EZ, known as the Hotline, will be clearly delineated. Access Control Point(s) will be established at the periphery of the EZ to regulate the flow of personnel and equipment into and out of the EZ, and to verify that relevant procedures for entry and exit are followed. Access to the EZ may be restricted to personnel with appropriate documented training (as defined in Section 6 of the HASP) and personal protective equipment (as defined in Section 8 of the HASP). Eating, drinking,

and smoking are prohibited in the EZ, with the exception of drinking for heat stress relief in the Break Areas (Section 5.1.4).

5.1.2 Contamination Reduction Zone (CRZ)

The CRZ is the area where personnel conduct personal and equipment decontamination. The CRZ serves as a transition area between contaminated areas and clean areas, and provides an area to prevent or reduce the transfer of contaminants that may be present on personnel or equipment returning from the EZ.

Emergency and first aid equipment (eye washes, etc.), will be available at the decontamination CRZ. Equipment resupply and temporary rest facilities (chairs, shade, liquids, etc.) will be available in all CRZs established.

Routine (i.e., non-emergency) access into and out of the CRZ from the EZ is controlled through Access Control Points (one each for personnel and equipment entrance and one each for personnel and equipment exit, if feasible). The boundary between the CRZ and the Support Zone (the Contamination Control Line) separates the low contamination area from the Support Zone. Entry into the CRZ from the Support Zone will be controlled through Access Control Point(s). Activities to be conducted in the CRZ will require PPE as defined in the decontamination procedures. Exit from the CRZ to the Support Zone requires the removal of any suspected or known contaminated PPE and compliance with decontamination procedures.

5.1.3 Support Zone

The Support Zone is a clean area where the chance of encountering hazardous materials or conditions is minimal. Emergency telephone numbers, hospital route maps and vehicle keys will be kept here. Health and safety records and up-to-date copies of the HASP will be on file in the Support Zone. Break/conference, lunch, storage/supply, security, office, sanitation and emergency medical facilities and telephones will be established in this area. Personnel may wear street clothes within this area. Eating and drinking are permitted in the Support Zone.

5.1.4 Break Areas

Break Areas will be provided in the EZ to provide locations for fluid replenishment, worker cool down and rest.

5.2 Buddy System

The buddy system, requiring at least two people who are in constant communication or work as a team, will be in effect for all work involving potential injury or exposure in the EZ. It will be enforced by the SHSO or his/her designee.

Buddies will be responsible for providing his/her partner with assistance, observing his/her partner for signs of injury or chemical or heat exposure, periodically checking the integrity of his/her partner's protective clothing, and notifying the SHSO or others if emergency help is needed.

5.3 Site Security/Site Access

The perimeter of the Site is not currently enclosed by a fence with gates that can be locked. ENVIRON will immediately construct a locked fence with access control upon receiving approval of the proposed work plan and HASP.

Only personnel meeting the requirements of the HASP will be allowed access to the Site. The SHSO will ensure that all visitors entering any on-site areas other than the Support Zone have the appropriate training, and have read and signed the Site HASP. Visitors must be accompanied at all times by trained Site personnel.

5.4 Site Communications

Successful communication between field teams and Support Zone personnel is essential. An internal communication system among on-site personnel and an external communication system between on-site and off-site personnel will be established.

5.4.1 Internal Communication System

The internal communication system will be used to relay health and safety information, communicate changes in the work, maintain Site control and alert personnel in the event of emergencies. Verbal communication will be the primary method of routine communications. Internal emergency communication systems will consist of compressed air horns and hand signals. All communications devices used in the EZ or CRZ must be certified as intrinsically safe and not capable of sparking in areas with potentially flammable atmospheres.

Compressed air horns will be the primary alarm system used to signify an emergency. If air horns fail, vehicle horns will be used as a substitute. The horn blasts

will be of a five to ten second duration. The signals will be repeated after five minutes to ensure that all Site personnel are alerted.

The following signals will be posted in the CRZ and Support Zone trailers and will be used to signify an emergency:

Number of Horn Blasts	Response
1	Power equipment shutdown
2	Injured person/Power Equipment Shutdown
3 (followed by a continuous long blast)	Power equipment shutdown/evacuate work area

The following hand signals may also be used to indicate an emergency situation:

Signal	Definition
Hands on top of head	Need assistance
Thumbs up	OK/I'm all right/I understand
Thumbs down	No/Negative
Grip partner's wrists	Leave area immediately

5.4.2 External Communication System

The external communication system between on-site and off-site personnel is necessary to report to management, maintain contact with essential off-site personnel and coordinate emergency response. Cellular telephones maintained in the Support Zone will be the primary means of external communication, and will be used to notify off-site emergency response agencies of incidents and to request assistance.

5.5 Personnel Hygiene and Site Safety Rules

All personnel working in on-site areas other than the Support Zone will follow the rules outlined below. These rules will be reviewed with new Site personnel during the Site orientation, and available within the Support Zone. Revisions and changes will be reviewed at the daily Site safety briefings. Personnel found to be disregarding the rules will be barred from the Site.

The following are the more important rules that will be observed throughout Site operations:

5.5.1 Personnel Hygiene and Prevention of Contamination

- Smoking, eating, chewing gum or tobacco, and hand to mouth contact are not allowed within the EZs or CRZs, or during personal decontamination or equipment decontamination. Drinking is not permitted in the EZ or CRZ, except under certain conditions in designated Break Areas to prevent heat stress. Hands, face and forearms must be thoroughly washed upon leaving the EZ or CRZ before eating, drinking or performing any other hand to mouth contact.

- Personnel expected to wear respiratory protective equipment are not permitted to wear contact lenses. However, if an emergency situation requires the use of respiratory protective equipment by personnel wearing contact lenses, they are permitted to wear full-facepiece respirators. Contact lenses prevent proper flushing in the event of irritating or corrosive material entering the eyes.

- Site personnel who grow facial hair in the vicinity of a respirator seal are required to be clean-shaven prior to the initiation of each day's work activities.

- Personnel who have entered the EZ or CRZ and who have the potential for significant exposure will be required to shower, including washing of hair, at the end of each shift.

- Potentially contaminated work clothes and towels will be collected in the CRZ for disposal.

- Contaminated non-disposable (e.g., respirator) protective equipment will not be removed from the CRZ until it has been cleaned or properly packaged and labeled.

- Personnel will attempt to minimize the potential for contamination by minimizing contact with hazardous substances. Contact with hazardous substances will be minimized by avoiding walking through areas of obvious contamination, avoiding direct contact with potentially hazardous substances, and using remote sampling, handling and container-opening techniques, when possible.

- Monitoring and sampling instruments will be protected when possible by placing the instrument in a clear plastic bag and securing it with tape. All equipment will be properly decontaminated before removal from the CRZ.

- Establish proper procedures for dressing prior to entering the EZ and for removing PPE during decontamination. All junctures should be taped to prevent Site contaminants from getting into gloves, boots, jackets or suits.

- Check PPE prior to each use to ensure that no cuts or punctures could expose workers to Site contaminants.

- Workers with skin surface injuries should avoid participating in activities within grossly contaminated portions of the EZ until the surface injuries have healed or unless otherwise allowed by the SHSO.

- Any skin contact with surface and ground water will be avoided, splash protection will be worn under any circumstance whereby contact with contaminated waters is possible.

- When possible, avoid high grasses and shrub areas, as these areas are more likely to harbor appreciable deer tick populations. This tick is responsible for the transfer of the spirochete bacterium that causes Lyme disease in humans. Wearing long-sleeved shirts and long pants that are tucked into boots when not suited out in Level C PPE will help to avoid dermal exposure to the ticks, and reduce the possibility of tick bites, as well as dermal exposure to contaminants.

5.5.2 General Safety

- All work, especially within the EZ, will be planned and supervised by the appropriate personnel to prevent injuries.

- Equipment operators will be thoroughly trained on the safe operations of their equipment prior to beginning work on the site.

- All injuries and accidents will be reported to the SHSO who will in turn report them to the SC.

- Supervisors will ensure that their employees observe and obey all safety rules and regulations required for the safe conduct of work.

- An employee reporting for work who, in the opinion of his supervisor, is unable to perform his assigned duties in a safe and reasonable manner will not be allowed on the job.

- Alcoholic beverages and illegal drugs will not be allowed on-site. Possession of either may be grounds for dismissal. The SHSO must be notified by any personnel taking prescription medication which may impair or effect an individuals ability to perform work activities.

- No employee will be assigned to a task without first having been instructed on proper methods of carrying out the task.

- There will be no horseplay or practical joking at the Site.

- All posted safety signs will be obeyed.

- Matches or lighters will not be allowed in the EZ or CRZ.

- Personnel must check in at the entrance/exit Access Control Point before entering/leaving the CRZ or EZ.

5.5.2.1 Site Appearance

- An adequate passageway for fire fighting vehicles will be maintained at all entrances and exits on-site.

- Space around on-site emergency and fire fighting equipment will be kept clear.

- All Support Zone trash and discarded materials will be staged in an orderly fashion and regularly removed from the Site.

5.5.2.2 Equipment

- Employees will not handle or attempt to operate power tools or motorized vehicles without proper training.

- Materials, tools, or other objects will not be thrown, tossed, or dropped. Always hand or lower items as needed.

- Apparatus, tools, equipment, and machinery will not be repaired while in operation.

5.5.2.3 Personal Protective Equipment

- Hard hats and steel toe safety boots will be worn at all times in all areas other than the Support Zone. Hard hats and safety boots may be required, at the discretion of the SHSO, for personnel in the Support Zone based on scheduled Site activities.

- Safety glasses, safety goggles, or face shields will be worn at all times where eye hazards due to flying particles, liquid splashes, or hazardous substances exist.

- Hearing protection will be worn when the noise level is sufficient to interfere with conversation and during all operations in which noise level readings are ≥90 dBA.

- Jewelry and loose clothing will not be worn around moving machinery. Long loose hair will be tied in back of the head.

5.6 Recordkeeping

Health and safety records for all on-site personnel will be maintained in the Support Zone. At a minimum, the following records will be maintained:

5.6.1 Exposure/Injury Incident Records

All injuries and exposures will be reported to the SHSO, regardless of whether the incident appears to be serious or not, or whether any adverse health effects or symptoms are apparent after the exposure. An Exposure/Injury Incident Report (provided as Appendix 3 of this HASP) will be completed within 24 hours after the incident, and maintained in the Support Zone. A log and summary of all recordable occupational injuries and illnesses (using form OSHA No. 200 or an equivalent) will be maintained in the Support Zone. Each recordable injury and illness will be entered on the log and summary as early as practicable but no later than 6 working days after receiving information that a recordable injury or illness has occurred.

5.6.2 Incident Information Summary

An Incident Information Summary form (provided as Appendix 4 to the HASP) will be completed by the SHSO, or his/her designee, following an incident (fire, explosion, chemical release, exposure, etc.). This form will be used to record important information about the incident. The summary will be analyzed to determine what measures should be instituted to prevent a recurrence.

5.6.3 Personnel Training Records

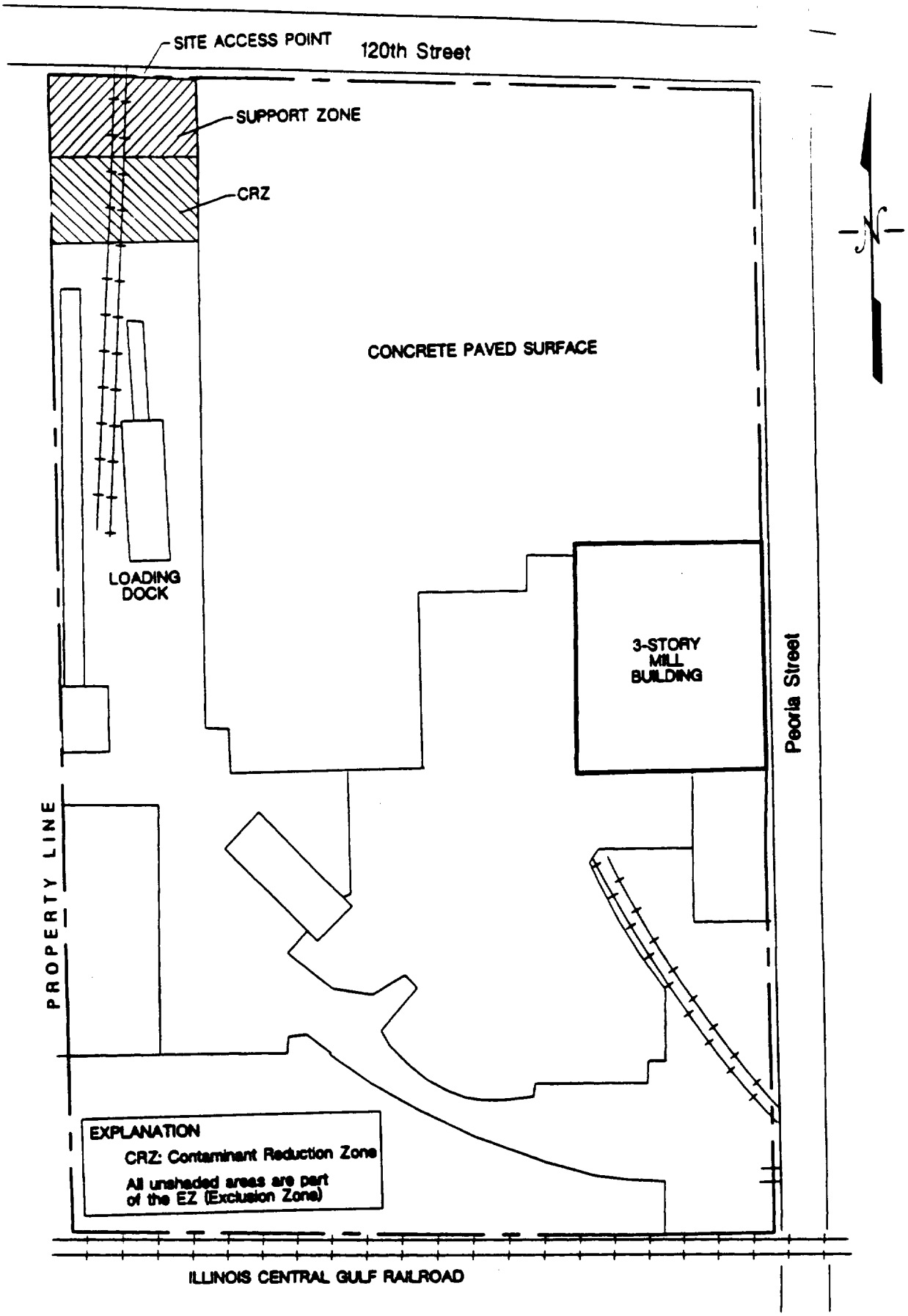
Documentation of health and safety training of on-site personnel, as described in Section 6 of the HASP, will be maintained in the Support Zone. This will include documentation of initial 40-hour or 24-hour health and safety training, 8 hours of annual refresher training, supervised field experience, 8 hours of supervisor training, CPR/first aid certification, and Site orientation and daily safety briefing logs. Documentation of respirator fit tests will also be maintained for each on-site employee.

5.6.4 Medical Surveillance Records

Documentation of participation in a medical surveillance program, fitness for work, and ability to use respiratory protective devices, as described in Section 7 of the HASP, will be maintained in the Support Zone for all on-site personnel. Complete medical records will be kept by the medical care provider and/or the medical consultant, and will be maintained as confidential.

5.6.5 Site Logs

Logs of visitor and site personnel, vehicles and equipment, and daily safety meetings will be maintained in the Support Zone. Errors will be crossed out with a single line in ink so that the error can be read, and will be initialed and dated by the person performing the entry.



NOTE: Not to Scale

c:\acad\014598A\14598AB2

ENVIRON
A Division of APSI
Environmental Sciences Group, Inc.

WORK ZONES
DUTCH BOY SITE
CHICAGO, ILLINOIS

Figure 5-1

6.0 PERSONNEL TRAINING REQUIREMENTS

All personnel performing on-site operations with the potential for exposure to hazardous substances or health hazards will meet the personnel training requirements in accordance with 29 CFR 1910.120(e). The training policies and procedures will ensure that personnel can recognize hazards, understand emergency response procedures, and have the knowledge necessary to enable them to perform their assigned jobs in a manner that ensures employee and public safety. Documentation of appropriate health and safety training, as described below, and medical surveillance participation, as described in Section 7 of the HASP, will be required to gain access to on-site areas other than the Support Zone. Documentation of all training, including initial 24-hour or 40-hour health and safety training, 8 hours of annual refresher training, 8 hours of supervisor training, supervised field experience, first aid training, and CPR certification will be kept on-site.

6.1 Initial Training

6.1.1 Basic Health and Safety Training

All personnel engaged in or supervising activities in the EZ or CRZ will have a minimum of 40 hours of initial health and safety training off-site, meeting the requirements of 29 CFR 1910.120(e)(3).

6.1.2 Supervised Field Experience

Personnel with 40 hours of initial health and safety training are required to have a minimum of 3 days of field experience under the direct supervision of an experienced supervisor.

6.1.3 Supervisor Training

All on-site managers and supervisors directly responsible for, or who supervise personnel engaged in invasive Site activities will have received the initial 40-hour health and safety training and at least 8 additional hours of specialized off-site training consistent with 29 CFR 1910.120(e)(4). This specialized training will include topics such as, but not limited to, regulatory compliance, management of on-site health and safety hazards and recognition of special personnel training needs.

6.1.4 Health and Safety Officer Training

Health and safety officers will be trained to a level required by their job function and responsibility. This will include training in implementation of HASPs and compliance with applicable health and safety requirements.

6.1.5 First Aid and CPR Training

A minimum of one individual certified by the American Red Cross (or equivalent) to render first aid and CPR will be available during all Site activities in the EZ. The Site Health and Safety Officer (SHSO) will have first aid and CPR training.

6.2 Refresher Training

All personnel who have received initial health and safety training will receive 8 hours of refresher training annually, as specified in 29 CFR 1910.120(e)(8). Topics to be covered in this training program will include those specified in the initial 40-hour health and safety training and/or those specified in the supervisory training course, as well as a critique of incidents that could serve as training examples.

Project-specific refresher training will be provided as appropriate when the project scope is changed and/or when the hazards change.

6.3 Hazard Communication

Site-specific hazard communication will be provided on-site by the SHSO. Material Safety Data Sheets (MSDSs) will be maintained at the Site for the major Site contaminants and for any hazardous materials purchased for use or known to be present on-site. The labeling provisions of 29 CFR 1910.1200 will be followed on-site. The written hazard communication program is provided as Appendix 5 to this HASP.

6.4 Project-specific Training

6.4.1 Procedure to Ensure Adequate Training

Prior to the initiation of specific tasks or assignments, personnel will review and sign the HASP (see Section 12). A brief meeting(s) with the SHSO will be conducted to identify the activity-specific hazards and hazard mitigation procedures.

6.4.2 Site Orientation

Project-specific training will be provided to all personnel involved in activities at the Site. Only personnel who have been documented as attending this training will be allowed to participate in the project. This will include a Site orientation session covering the following topics:

- Project organization, including names of personnel responsible for Site safety and health
- Site description
- Site control measures -- including communications and emergency signals
- Work plan review
- Hazard identification
  - Chemical/physical/biological hazards, including specific health hazard data on lead
  - Recognition of symptoms and signs that indicate overexposure to hazards
  - OSHA-PELs
- Site Hazard Communication Program
  - Chemical inventory
  - Location and access to MSDSs
  - Labeling
  - Hazards associated with Site materials
- Safe work practices
  - Personnel hygiene and Site safety rules
  - Work zones and contamination control
- Personal protective equipment
  - Level of PPE required for specific tasks or areas
  - Respiratory protection (selection, use and maintenance)
- Air monitoring -- personal and environmental
  - Frequency and types
  - Instrumentation (calibration, use and maintenance)
  - Recordkeeping

- Engineering controls
  - Safe use of engineering controls and equipment
- Medical surveillance
  - Medical monitoring documentation
  - Medically approved to perform work in task-specific PPE
- Decontamination procedures
- Emergency response procedures
  - Roles and lines of authority
  - Medical emergencies and first aid treatment
  - Communications
  - Spills/releases
  - Evacuation and refuge
  - Emergency equipment location and posting
  - Incident reporting
  - Emergency decontamination
  - Fires and explosions

6.4.3 Site Safety Briefings

Site safety briefings will be conducted prior to the start of each work day, or work shift to discuss health and safety issues, changes in work procedures, exposure incidents and other relevant information. ENVIRON's SHSO or a contractor SHSO may conduct these meetings as appropriate. Prior to each change in operations, the meetings will address PPE use and maintenance, physical safety hazards from machinery, protection from chemical hazards, decontamination procedures, protection from heat/cold stress and specific safety requirements associated with the new operations. Any new changes in the HASP will be reviewed during the morning safety briefing. A record of the meeting will be written daily and signed by all participants. These records will be stored in the field office.

6.4.4 Contractor Training

All ENVIRON subcontractors whose employees must enter the EZs or CRZs will certify that their employees have successfully completed training that satisfies the OSHA requirements for hazardous waste workers. This certification record will be stored in the

Support Zone. Additional job-specific on-site training and safety briefings, as discussed in the previous sections, will be performed and documented by the SHSO or SM.

6.4.5 Visitor's Briefing

Visitors will not be permitted to enter areas other than the Support Zone unless documentation of training, as described above, is presented to the SHSO. All visitors will be trained by the SHSO or SM in hazard recognition, personnel hygiene and site safety rules, use of PPE, and emergency response procedures. Visitors who do not meet the training requirements requesting on-site access to areas other than the Support Zone will be required to obtain the permission of the SHSO, be required to sign a release of liability waiver, read and sign the HASP, and will be escorted by a SHSO or SC when accessing the CRZ or EZ.

7.0 MEDICAL SURVEILLANCE

The goals of the medical surveillance program are to monitor the health of potentially exposed personnel through the use of medical examinations and diagnostic laboratory testing, to provide medical care for occupational injury or illness, to keep accurate records for future reference, and to ensure the selection of personnel physically able to safely perform the work assigned. The medical surveillance program supports and monitors the effectiveness of the primary health and safety goal of controlling worker exposure to hazardous substances. OSHA regulations relating to medical surveillance during hazardous waste operations are detailed in 29 CFR 1910.120(f). Medical examinations will be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine.

Documentation of current participation in a medical surveillance program and fitness for duty, including ability to wear respiratory protective equipment, will be necessary for all personnel who work on-site in areas other than the Support Zone. However, all specific medical information and examination results obtained in the course of administration of the medical surveillance program will be maintained by the examining physician as confidential.

7.1 Baseline Medical Examinations

The baseline medical examination serves two major purposes: (1) it determines the individual's fitness for duty, including the ability to work while wearing a respirator; and (2) it provides baseline data for comparison with future medical data. The baseline medical examination will include, at a minimum, the following:

- Complete occupational and medical history;
- Physical examination;
- Blood count and chemistry profile;
- Urinalysis with microscopic review;
- Chest x-ray;
- Pulmonary function tests;
- Resting electrocardiogram (EKG); and
- Cardiac stress test (at physician's discretion).

Certification of fitness for duty and ability to wear personal protective equipment must be provided to gain access to on-site areas other than the Support Zone. However, all specific medical information obtained in the course of administration of the medical surveillance program will be maintained as confidential.

7.2 Periodic Medical Examinations

Each individual enrolled in the medical surveillance program will be subject to periodic medical surveillance examinations. In general, personnel involved in field activities with a frequency of greater than 30 days per year will receive medical examinations at least annually. Periodic medical examinations should include the parameters included in the baseline examination, with the exception of the chest x-ray and EKG, which are repeated after the baseline examination at the physician's discretion and with agreement of the individual.

7.3 Special Medical Examinations

Special medical examinations will be arranged for personnel exposed in an emergency situation to hazardous substances at concentrations above the OSHA-PELs without adequate protection. This will be done as soon as possible after the exposure has been determined by the SHSO, in consultation with the Health and Safety Manager.

Special medical examinations shall also be arranged upon notification by the SHSO that an individual has developed signs or symptoms indicating a possible exposure to hazardous substances, or if the examining physician determines that more frequent medical examinations are necessary. Non-scheduled medical examinations may also be directed at the discretion of the SHSO.

7.4 Special Circumstances

Any individual who is on a medication that may interfere with the ability to perform his/her job function, or who may require special medical attention, must notify ENVIRON and/or subcontractor of these circumstances prior to commencing work at the Site.

8.0 PROJECT ACTIVITIES/PERSONAL PROTECTIVE EQUIPMENT

Many of the activities to be conducted by ENVIRON personnel at the Site are required by ENVIRON's role of Contractor as defined in the Order. This role is primarily one of administrative and coordination responsibilities, with oversight of activities conducted by ENVIRON and ENVIRON's subcontractors. ENVIRON personnel may also be involved in future site characterization, remedy feasibility testing, or remediation activities within the exclusion zone. Activities to be conducted and overseen by ENVIRON at the Site potentially include the sampling of surface and subsurface soils.

The purpose of personal protective equipment (PPE) is to shield or isolate individuals from chemical, physical, or biological hazards that may be encountered during Site activities. PPE will be selected and used to protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

The level of protection selected will be based on the type, concentration and toxicity of the contaminant(s), and the potential for exposure to contaminants in air, liquids, or other direct contact due to work being performed. All intrusive or dust-generating activities conducted within the EZ (other than Site reconnaissance) will be initially conducted in Level C PPE augmented by personal air monitoring (see Section 9.2). Protection may be downgraded to Level D based on the results of the initial personal air monitoring. For any new tasks conducted by ENVIRON personnel, and for tasks not specifically mentioned in the HASP, PPE selection will be made on-site by the SHSO based on the type, concentration and toxicity of the contaminants and the potential for exposure to contaminants in air due to work being performed.

The type of equipment and the level of protection will be reevaluated periodically as more information about the Site is obtained and as workers are required to perform different tasks. The procedures described in this HASP section allow for upgrading and downgrading of levels of PPE to preclude any potential for exposure to contamination while not compromising efficiency. Upgrading of PPE will be based on direct readout instruments; downgrading of PPE for tasks specifically mentioned in the HASP will be based on direct readout instruments and personal air monitoring results and will require approval of the Health and Safety Officers and review by applicable contractor Health and Safety Managers.

Visitors and contractors will be required to provide their own personal and respiratory protective equipment. Failure to use the appropriate PPE will be grounds for dismissal from the Site. All personnel will be trained in the use of PPE as stated in Section 6 of the HASP.

8.1 Selection of PPE

The selected PPE should be able to resist degradation, penetration, and permeation by the contaminants present at the Site. In selecting the appropriate protective material, the following should be considered: chemical resistance; tear and puncture resistance; flexibility; thermal stress; cleanability; and durability. Additional factors to be considered in the selection of PPE include the potential for exposure, and the physical nature and the concentration of the material being handled.

PPE will be selected, used and maintained in accordance with 29 CFR 1910.132, *General requirements*. Eye and face PPE requirements will be in accordance with 29 CFR 1910.133, *Eye and face protection*, and ANSI Z87.1-1979. Respiratory protection will be selected in accordance with 29 CFR 1910.134, *Respiratory protection*. Selection of foot protection will conform with ANSI Z41.1-1983, and 29 CFR 1910.136, *Occupational foot protection*. PPE for the head will be in accordance with 29 CFR 1910.135, *Occupational head protection*, and ANSI Z89.1-1986.

The four levels of PPE are Levels A, B, C, and D, with Level A providing the highest available level of respiratory, skin, and eye protection. Since the use of Level A or B PPE is not anticipated, it is not discussed in detail in this HASP. As described in Section 5, basic safety equipment (i.e., hard hats, safety glasses and safety boots) are required in posted areas of the support zone. A summary of the basic site-specific PPE ensembles for the EZ are provided in Table 8-1. The selection of a PPE level for operations at the Site will be tailored to address specific task conditions. The basis for selecting PPE levels are provided below.

8.1.1 Level C

Because chemical-resistant clothing is not considered gas-, vapor-, or particulate-tight, level C does not provide the maximum degree of skin protection. However, a good quality, hooded, chemical-resistant one-piece garment with taped wrists and ankles provides a reasonable degree of protection against splashes of liquids and lower concentrations of chemicals in ambient air. Level C protection utilizes air-purifying respirators (APR) to provide respiratory protection. APRs can be used only if the substance has adequate warning properties; the individual passes a qualitative fit-test for the mask; an appropriate cartridge/canister is used and its service limit concentration is not exceeded; and Site operations are not likely to generate unknown compounds or excessive

concentrations of already identified substances. Level C PPE can be used when all of the following conditions are met:

- Oxygen concentrations are not less than 19.5 percent;
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any exposed skin;
- Types of air contaminants have been identified, concentrations measured, and a cartridge or canister is available that can remove the contaminant (see Table 8-2);
- Atmospheric contaminant concentrations do not exceed IDLH levels; and
- Job functions do not require self-contained breathing apparatus (SCBA).

8.1.2 Level D

Level D PPE provides the same skin protection as Level C, unless otherwise approved by the SHSO, but does not include respiratory protection. Level D PPE can be used when the following conditions are met:

- Atmosphere contains no known hazard (see Table 8-2);
- Oxygen concentrations are not less than 19.5 percent; and
- Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

8.2 Respirator Fit Test

A respirator fit test will be conducted on all Site personnel who will perform work operations in areas other than the Support Zone. Prior to the initiation of any fit testing, personnel must be certified as medically able to wear a respirator. The respirator fit test is conducted to ensure proper facepiece-to-face seal. A secure fit is important with positive-pressure equipment, and is essential to the safe functioning of negative-pressure equipment, such as most air-purifying respirators. Personnel will receive instruction on proper wear and maintenance of the respirator.

Qualitative fit tests will be conducted annually in accordance with the ANSI *Practices for Respiratory Protection*, Z88.2-1989. In addition, a negative and positive fit check will be performed each time an employee dons the air-purifying respirator (APR). Documentation of

successful completion of a respiratory fit test no longer than six (6) months prior to the initial start date must be provided by all personnel expecting to work at the site.

8.2.1 Negative and Positive Fit Check

The negative and positive pressure fit check will be performed each time an employee dons the APR. The negative pressure fit check involves closing off the inlet openings to the APR cartridges by covering with the palms of the hands. If an inward leakage of air is detected, the APR should be checked for material defects and refitted or replaced with another APR.

The positive pressure fit check is performed by placing the palm of hand over the exhalation valve and gently exhaling for 10 seconds to create positive pressure inside the facepiece. If an outward air leak is detected, the APR should be readjusted. If after readjustment leakage still occurs, another APR should be used.

8.3 PPE Inspection Checklist and Maintenance

PPE inspections will be conducted upon receipt of PPE from the factory or distributor; when it is issued to workers; after use or training; and prior to maintenance. Periodic inspections of stored equipment will be conducted routinely, whenever a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise. At a minimum, PPE inspection should include the following:

<u>Clothing</u>

Before use:

- Determine that the clothing material is correct for the specified task.
- Visually inspect for:
  - imperfect seams
  - non-uniform coatings
  - tears
  - malfunctioning closures
- Hold up to light and check for pinholes
- Flex product:

- observe for cracks
- observe for other signs of shelf deterioration

- If the product has been used previously, inspect inside and out for signs of chemical breakthrough or deterioration, such as:
  - discoloration
  - swelling
  - stiffness

During the work task, periodically inspect for:

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

<u>Gloves</u>

- Before use, pressurize glove to check for pinholes. Either blow into glove or inflate glove and hold under water. In either case, no air should escape.

Respirators

SCBA/supplied air/air-purifying

- Inspect SCBA/supplied air/air-purifying respirators before and after each use, at least monthly when in storage and during cleaning. Air-purifying respirators should be inspected before each use to be sure they have been adequately cleaned.
- Check all connections for tightness, inspect air lines prior to each use for cracks, kinks, cuts, frays, and weak areas.
- Check for proper setting and operation of regulators and valves (according to manufacturer's recommendations) and check operation of alarms.
- Check material conditions for:
  - signs of pliability
  - signs of deterioration
  - signs of distortion
- Check faceshields and lenses for:
  - cracks
  - crazing
  - fogginess
- Examine cartridges or canisters to ensure that:
  - they are the proper type for the intended use
  - the expiration date has not passed
  - they have not been opened or used previously
- If at any time during the work day PPE is observed to have been compromised, the affected workers will cease operations and the PPE will be replaced.

TABLE 8-1
Summary of PPE for EZ Activities

Area of Protection	Personal Protective Equipment	Level		Applicable Regulations/Guidelines
		C	D	
Full Body	1) Work coveralls laundered in the CRZ or 2) Tyvek or Saranex suits (chemical-resistant clothing such as overalls and long-sleeved jacket; one-or two-piece chemical splash suit; disposable chemical-resistant one-piece suit)	X	X	29 CFR Part 1910.132
Respiratory Protection	1) Full face, air purifying respirator (MSHA/NIOSH approved), equipped with HEPA cartridge OR 2) Half face, air purifying respirator (MSHA/NIOSH approved), equipped with HEPA cartridge AND goggles	X		29 CFR Part 1910.134; ANSI Z88.2 (1980)
Head	Hard hat	X	X	29 CFR Part 1910.135; ANSI Z89.1 (1986)
Eyes and Face	Safety glasses or goggles		X	29 CFR Part 1910.133
Ears	Hearing protection (e.g., ear plugs, ear muffs, or headphones), when noise level is sufficient to interfere with conversation.	X	X	29 CFR Part 1910.95
Hands and Arms	Gloves, outer nitrile or neoprene, duct tape as necessary at seams	X*	X*	29 CFR Part 1910.132
	Gloves, inner nitrile	X	X	
Feet	1) Rubber boots with steel toe and shank, or 2) Safety boots, steel toe/steel shank and rubber over boots or boot covers, chemical-resistant and disposable, duct tape as necessary at seams	X	X	29 CFR Part 1910.136; ANSI Z41.1 (1983)

* Optional, at discretion of SHSO.

TABLE 8-2
Summary of Action Levels for Real Time Air Monitoring Data

Instrument Reading	Action	PPE Level
PID < 1 PPM	No Action	Level D
1 PPM ≤ **PID** ≤ 10 PPM	Use Draeger tubes: If no constituent detected Benzene at 0.75 ppm to 7.5 ppm Benzene greater than 7.5 ppm	 Level D Level C Abandon work area, contact SHSO
10 ppm ≤ **PID** ≤ 20 ppm	Use Draeger Tubes If no constituent detected Benzene at 0.75 ppm to 7.5 ppm Benzene greater than 7.5 ppm	 Level D Level C Abandon work area, contact SHSO
PID > 20 ppm	Abandon work area, contact SHSO	

Key:
PID = Photoionization detector
Note: **If evidence of buried drums or free product (NAPL) is unexpectedly encountered, abandon work and notify SHSO.**

9.0 WORK ACTIVITY AIR MONITORING/SAMPLING PROCEDURES

Air monitoring and personal air sampling will be conducted to identify and quantify airborne contaminants in order to delineate areas where personal protective equipment (PPE) is needed; determine the level of PPE necessary; document on-site employees' exposures; assess the potential health effects of exposure; determine the need to implement engineering controls or evacuate the work zone or Site; and determine the need for specific medical monitoring.

Hazardous atmospheres include explosive, toxic, or oxygen-deficient atmospheres or a radioactive environment. The potential presence of one or more of these atmospheres determines subsequent actions to protect workers or the environment, contingency procedures to mitigate the incident, and safety considerations for emergency response personnel.

The two principal approaches that will be used to identify and/or quantify hazardous atmospheres in work areas are air monitoring using direct readout instruments and personal air sampling. Air monitoring consists of using direct readout instruments to provide real-time indications of air contaminants. Air sampling consists of collecting air on an appropriate medium or in a suitable sampling container followed by laboratory analysis.

Air monitoring readings and personal air sampling results will be reviewed and work conditions evaluated by the SHSO. Any changes in the Section 8 PPE requirements will be made only with approval of the SHSO.

9.1 Direct Readout Instruments (Real-time Monitoring)

As described in Section 8.0, real-time monitoring with direct readout instruments will be used to rapidly detect certain gases and vapors. Real-time monitoring will be conducted in the breathing zone (4-6 feet above ground level) at each active work area by the worker closest to the work zone. Real-time monitoring action levels for personal protective equipment decision-making are provided in Table 8-2 of the HASP.

Readings that exceed action levels will be immediately reported to the SHSO and SC. Daily real-time monitoring logs, including the location, time, type of monitoring equipment and value of readings will be maintained and provided to the SHSO.

Monitoring frequency will be increased during higher risk activities such as excavation. Sampling frequency may be also be increased if a PPE downgrade option is exercised.

All direct readout instruments will be calibrated daily prior to the initiation of Site activities, or as specified by the manufacturer. Instruction manuals for all instruments will be

located on-site. General information on direct readout instruments that will be used at the Site is provided below.

9.1.1 Organic Vapors

9.1.1.1 Total Organic Vapors

A Photoionization Detector (PID) will be used to determine the adequacy of the respiratory protection from airborne organic compounds afforded the employee. PID readings will be recorded during the start of a new Site activity, upon detection of organic odors, and at least once per hour. Action levels for PID readings are provided in Table 8-2 of the HASP.

9.1.1.2 Specific Organic Contaminants

Chemical-specific detector tubes (e.g., Draeger tubes) may be used in conjunction with the PID to determine chemical-specific contributions to the PID readings. Table 8-2 of the HASP identifies contaminants and conditions that require detector tube analysis and provides specific action levels for upgrading or downgrading PPE based on detector tube readings.

9.2 Personal Air Sampling

Personal air sampling will be conducted for lead, aresenic, and, if necessary, asbestos, at least once per 40 hours of on-Site activity during the initial activities at the Site. Subsequently, personal air sampling will be conducted when a significant change in operations may result in a variation of potential lead exposure (e.g., soil sampling, boring activities, etc.). Personal air sampling for exposure to benzene will be conducted if a sustained reading above the benzene action level are detected with a Draeger tube. Sampling will be performed on personnel with the highest potential for exposure to specific airborne contaminants and will be conducted to measure exposure during a specified shift for each job classification in a work area. Personal air samples will be collected in the breathing zone to represent actual inhalation exposure of workers who are not wearing respiratory protection. The results from personal air sampling will be used to assess appropriate levels of PPE. Full-shift (continuous seven-hour) air samples for specific air contaminants will be collected in accordance with the respective OSHA performance standard.

Personal air samples will be sent to an accredited American Industrial Hygiene

Association laboratory for analysis. Analysis will be conducted using NIOSH methods, or equivalent.

Personal air sampling will be conducted using an SKC Universal Constant Flow Sampler 224-43XR or equivalent. Flow rate calibration on air sampling pumps will be conducted prior to and after the sampling period, using a primary calibration device, or a secondary calibration device which has been calibrated using a primary device. The flow rate will be set using NIOSH sampling methodology.

OSHA has promulgated the following action levels: 30 $\mu g/m^3$ for lead, 5 $\mu g/m^3$ for arsenic, 0.5 ppm for benzene, and 0.1 fibers/cm^3 for asbestos. The action levels are based on eight-hour time-weighted-average (TWA). If any personal air samples should exceed the respective action level, then on-site personnel will be required to upgrade their level of personal protection to the appropriate level until additional sampling results have confirmed otherwise.

10.0 EQUIPMENT AND PERSONNEL DECONTAMINATION

Decontamination procedures will be implemented to protect personnel from hazardous substances that may contaminate and/or eventually permeate the protective clothing, respiratory protective equipment, tools, vehicles, and other equipment used on-site; to protect all Site personnel by minimizing the transfer of harmful materials into clean areas; to prevent mixing of incompatible chemicals; and to protect the community by preventing uncontrolled transportation of contaminants from the Site.

Personnel exiting the Exclusion Zone (EZ) will pass through the Contaminant Reduction Zone (CRZ), where protective gear will be cleaned and/or discarded. The CRZ for the excavation activities and stabilization area will be identified subsequent to ENVIRON's preliminary Site reconnaissance.

10.1 Decontamination Facilities

10.1.1 Personnel

Because the Site has been abandoned for more than ten years, it is unlikely that a potable water supply exists on-site. Personnel decontamination will take place to the best extent possible using a bottled or portable pressurized water supply. The personnel decontamination area will contain a clean side with space for street clothing, and a dirty change area facing the EZ.

10.1.2 Equipment

Equipment will be decontaminated prior to exiting the EZ. Decontamination of all equipment will include washing with a non-phosphate detergent and triple-rinsing with tap water.

10.2 Decontamination Procedures

10.2.1 Personnel Decontamination

All personnel leaving the EZ must exit through the CRZ and perform appropriate decontamination procedures to prevent the transfer of contaminated materials into clean areas. All workers must be decontaminated before exiting the CRZ. The extent of their

decontamination will be determined by the SHSO based on the types of contaminants they may have contacted and their function in the CRZ.

The decontamination process consists of a series of procedures performed in a specific sequence, depending on the level of PPE worn and Site contaminants present. Prior to the start of work activities, the number and layout of decontamination stations will be determined. To prevent cross-contamination, each procedure will be performed at a separate station, and stations will be arranged in order of decreasing contamination.

Personnel will adhere to the following, or equivalent, decontamination procedures, which should be performed in the following sequence:

PERSONNEL EXITING EZ:

- Scrub outer boot covers or PVC overboots and outer gloves with decontamination solution or detergent and water. Rinse.

- Deposit equipment (real-time air monitoring equipment, etc.) used in the EZ on tables in the CRZ, for subsequent decontamination.

- If heavy contamination is evident, remove contamination, to the extent possible, from disposable suit and/or tank using disposable wipes or towels, with assistance from CRZ technician.

- Remove tape around boots and gloves. Remove outer boots/boot covers and outer gloves. Discard tape, boot covers and outer gloves in appropriate container.

- If in Level C PPE, while still wearing the facepiece, remove disposable suit. Next, remove facepiece. Dispose of cartridges. Decontaminate facepiece.

- Remove inner gloves and discard in appropriate container.

- Thoroughly wash hands and face. Personnel with the potential for significant exposure will shower as soon as possible.

10.2.2 Equipment Decontamination

10.2.2.1 Sampling Devices/Tools

All sampling devices will be decontaminated to prevent cross-contamination or mixing of incompatible chemicals. Sampling devices and tools will be decontaminated by scrubbing or wiping using a decontamination solution and water. Tools that are difficult to decontaminate should be kept in the EZ and handled only by workers using the appropriate PPE. At the end of the task, tools that cannot be decontaminated should be properly discarded.

10.2.2.2 Respirators

Respirators will be decontaminated after each use and sanitized at the end of each day before being reused. Rubber components of respirators can be soaked in soap and water and scrubbed with a brush. Other parts, such as the harness and straps, which are difficult to decontaminate may need to be discarded if grossly contaminated. Respirator maintenance should be conducted according to the manufacturer's recommendations. Personnel are responsible for decontaminating their own respirators.

10.2.2.3 Vehicles and Heavy Equipment

All heavy construction equipment used in the EZ at the Site must be properly decontaminated by the contractor using the equipment prior to release from the Site. Decontamination methods will be at the discretion of the contractor, but will generally consist of pressure washing. Vigorous hand scrubbing with detergent solutions, or other intensive methods, may be necessary in some cases.

10.3 Emergency Decontamination

During emergency situations, decontamination will be performed to the extent appropriate without compromising medical attention to the victim. If decontamination may aggravate or cause more serious health effects, or if the injuries are life-threatening, prompt first aid and medical treatment should be administered without decontamination or concurrently with it. Outer garments can be removed if it does not delay or interfere with medical treatment or aggravate the problem. Respirators and backpack assemblies must always be removed. If the outer garments cannot be safely removed, the victim should be wrapped in plastic, rubber or blankets to minimize contamination of emergency transport vehicles and medical personnel. Whenever possible, Site personnel should accompany the contaminated victim to the medical facility to advise on matters involving decontamination.

10.4 Equipment for Decontamination of Personnel, PPE and Equipment

The following is a list of equipment that may be needed to conduct proper decontamination of personnel, PPE and equipment:

- Drop cloths of plastic or other suitable materials on which heavily contaminated equipment and other protective clothing may be deposited.
- Collection containers, such as drums or suitably lined trash cans for storing disposable personal protective clothing or equipment that must be discarded.
- Galvanized tubs, stock tanks, or children's wading pools to hold wash and rinse solutions and large enough for a worker to place a booted foot in.
- Appropriate wash solutions to wash off and reduce hazards associated with the contaminants.
- Long-handled, soft-bristled brushes to scrub contaminants off PPE and for general exterior cleaning of heavy equipment.
- Pressurized sprayers for washing and rinsing, particularly hard-to-reach areas.

- Paper or cloth towels for drying protective clothing and equipment.

- Plastic sheeting, sealed pads with drains, or other appropriate methods for containing and collecting contaminated wash and rinse solutions.

- Soap or wash solution, wash cloths, and towels for personnel.

11.0 EMERGENCY RESPONSE PLAN

11.1 Introduction

The emergency response plan (ERP) describes contingencies and emergency response procedures. The ERP defines the responsibilities of key personnel in planning, prevention and response to emergency situations, and identifies agency contacts and medical care procedures. The ERP addresses measures to prevent and respond to emergency situations, such as fire or explosion; spill or release of hazardous material; personnel injury or illness; or other events such as severe weather conditions. This ERP is prepared in accordance with 29 CFR 1910.120(l).

During the Site orientation and/or Site safety briefings, Site personnel will be trained in emergency response procedures, on-site communication systems and evacuation routes, as stated in Section 6.4 this HASP. All Site personnel will be required to fill out a Medical Data Sheet, provided as Appendix 6 to this HASP.

The Incident Information Summary (IIS), provided as Appendix 4 to this HASP, will be completed by the Site Contractor, or his/her designee, at the time of an incident to record important information about the incident. The IIS will serve as a means of documenting all incidents and will be used to evaluate work procedures/areas to prevent recurrence of incidents.

11.2 Personnel Involved in Emergency Response

Key personnel involved in Site emergency response include the Site Coordinator/Site Emergency Response Coordinator (SC/SERC), Site Health and Safety Officer (SHSO), the ENVIRON PC and contractor Project Managers. Clear lines of authority have been established for implementing emergency response procedures and for ensuring safety compliance. All emergencies and personal injuries will be immediately reported to the SC/SERC and SHSOs.

The SHSO will update the SC on health and safety issues as necessary. All Site personnel will be familiar with the Emergency Response Telephone Roster, provided as Table 11-1 in this section, and will understand the proper chain of command. A listing of on- and off-site emergency contacts and key personnel and their alternates will be posted in the Support Zone and throughout the Site.

11.2.1 Emergency Response Telephone Roster

The Emergency Response Telephone Roster consists of persons and organizations both on- and off-site who would be involved in the ERP. This roster, provided as Table 11-1, will be kept in the Support Zone. A list of on-site personnel who are trained in first aid and CPR will be posted throughout the Site.

11.3 Emergency Communications

The external communication system between on-site and off-site emergency response personnel is necessary to report to management, maintain contact with essential off-site personnel and coordinate emergency response. Cellular telephones maintained in the Support Zone will be the primary means of external communication, and will be used to notify off-site emergency response agencies and to request assistance.

11.3.1 Internal Communication System

Refer to Section 5.4.1 of this HASP for internal communication procedures.

11.4 Emergency Medical Care and Treatment

All injuries and exposures will be reported to the SHSO, regardless of whether the incident appears to be serious or not, or whether any adverse health effects or symptoms are apparent after the exposure. Section 5.6.1 of this HASP, Exposure/Injury Incident Records, provides information on recordkeeping requirements. As indicated in Appendix 7, universal precautions to bloodborne pathogens shall be observed while administering first-aid.

11.4.1 On-site Medical Services

A first aid station will be established on-site in the Support Zone. The facility will be equipped with an "industrial" first aid kit and additional supplies including potable water, ice, emergency eyewash, and decontamination solutions.

11.4.2 Off-site Medical Services

In the event of an injury, prompt medical attention should be administered. If ambulance transport is required and/or the victim is chemically contaminated, the SC/SERC must coordinate assistance from off-site emergency response personnel by dialing 911. If it is deemed safe to transport the injured party in a Site vehicle, the injured

party may be transported to St. Francis Hospital. In this case, the Calumet City Fire Department (CCFD) will be notified via the non-emergency phone number. Table 11-3 contains instructions for contacting CCFD under these non-emergency circumstances. Emergency response personnel will be provided with the Medical Data Sheet (Appendix 6 of this HASP), which will accompany the victim to the hospital.

Important emergency telephone numbers are provided below. Directions to St. Francis Hospital are provided as Table 11-4, and a hospital route map is provided as Figure 11-1. This emergency information will be posted throughout the Site and in each Site vehicle.

Chicago Emergency	911
St. Francis Hospital	(708) 597-2000
Christ Community (Trauma Unit)	(708) 425-8000
Chicago Fire Department	(312) 347-1313

11.4.3 Emergency Equipment

A first-aid kit will be stocked and fully supplied by the SHSO. The SHSO will also be responsible for ensuring that the emergency equipment is maintained and functional.

11.4.3.1 First Aid Kits

Industrial first aid kits and eye washes will be available in the Support Zone and CRZ.

11.5 Inspections and Preventive Maintenance

11.5.1 Inspections

Routine inspections of Site equipment, facilities, work areas and work practices will be conducted by the SHSO or designee. These inspections will include, but are not limited to:

- Housekeeping;
- PPE usage, storage, supplies;

- Emergency equipment and supplies;
- Effect of weather conditions on Site safety; and
- Decontamination facilities and hygiene practices.

11.5.2 Preventive Maintenance

A preventive maintenance program will be implemented which will consist of the following:

- Heavy Equipment -- All heavy equipment (e.g., excavators, dozers, dump trucks) will be inspected daily by the operators, when in use. Preventive maintenance/service will be performed by a trained mechanic in accordance with manufacturer's recommendations.

- Portable Equipment -- Operator's and Service Manuals will be maintained for all portable equipment. Personnel will be instructed to inspect such equipment before and after use. Defects will be immediately reported to the supervisor. Defective equipment will be removed from service until repairs are made. Preventive maintenance will follow manufacturers' instructions.

- Tools -- Power and hand tools will be inspected daily by the user when in use. Defects will be reported to the supervisor and defective tools will be removed from service.

11.6 Emergency Response Planning and Training

11.6.1 Planning

On-site emergency response and decontamination procedures will be consistent with federal, state, or local emergency response plans. Site security will be maintained as stated in Section 5.3 of this HASP.

Immediate actions will be taken to control and mitigate the effects of emergencies. Some of these actions are outlined below:

Injuries/Exposures

- On-site first aid
- Removal from exposure
- Emergency decontamination

Fires/Explosions

- Incipient stage fire fighting with portable fire extinguishers
- Evacuation to safe refuge

Spills

- Containment of spills on-site using absorbents or berms
- Cleanup of spilled material

Air Releases

- Air monitoring to detect releases
- Application of vapor or dust suppressant in excavation or material handling areas

However, it is recognized that incidents are possible that would result in emergencies beyond the on-site emergency response capabilities. Such incidents might include:

- Life-threatening injuries or injuries/exposures requiring medical treatment;
- Major explosions or fires progressing beyond incipient stage;
- Air releases that cannot be immediately controlled.

In the event such contingencies occur, emergency response resources such as ambulance services, emergency medical, fire fighting and HAZMAT will be coordinated by contacting Chicago Emergency (911).

11.6.2 Training

As part of the project-specific training, all Site personnel will be instructed on emergency response procedures, and the location and use of on-site emergency equipment, and will have received emergency response training. This training will include response procedures for personal injury, illness and overexposure; fires and explosions; chemical releases or spills to the environment; and other events including severe weather conditions and adverse community activity. Other issues that will be addressed are evacuation signals and location of safe refuge; on-site chain-of-command; on-site emergency communication system; Site control measures; and on- and off-site emergency resources.

Visitors will be briefed on hazard recognition, safe work practices and basic emergency procedures, such as evacuation routes, on-site emergency communication, and decontamination.

Site personnel will be trained in their respective emergency response roles and will have a thorough understanding of emergency response procedures including: emergency communication methods and signals; chain of command; emergency equipment and its use; decontamination; emergency evacuation while wearing protective equipment; medical assistance; fire prevention and control; and off-site emergency response and support agencies. A minimum of one individual will be certified in first aid and CPR. Personnel will be trained in recognizing and treating chemical and physical injuries, and heat and cold stress. The training program will also include periodic site-specific emergency response drills for on-site personnel. All training and practice sessions will be documented and the records maintained in the Support Zone.

11.7 Emergency Prevention, Recognition and Response Procedures

Emergency prevention, recognition and response procedures for each of the following emergency situations, fire/explosion, chemical spill/release, personal injury, and other events such as severe weather conditions and adverse community activity are provided below. In the event that the health and safety of the local community may be impacted by an emergency situation during Site activities, the SC/SERC will contact the CCFD.

In all cases described above, including "near misses," an Incident Information Summary (Appendix 4 to this HASP) will be completed by the SC or the SC's designee. The incident will be analyzed and appropriate revisions to the HASP or changes to work operations will be approved by the CHSO and SHSO and incorporated as needed.

11.7.1 Fire/Explosion

11.7.1.1 Prevention

Fire prevention and protection measures include elimination of ignition sources, where feasible, identification of combustion sources and atmospheres, and early detection and rapid response to fire/explosion situations. In addition to standard operating procedures, the following safe work practices will be implemented:

- Site activities will comply with National Electric Code and explosion proof criteria.
- Smoking will not be allowed in on-site areas other than Support Zone.
- Appropriate air monitoring procedures will be conducted especially when work activities occur in the presence of uncharacterized waste.
- Welding, open flame or spark-producing operations will not be allowed on-site without prior approval from the ENVIRON SHSO and the preparation of a hot work permit.
- Solvents with a flash point of less than or equal to 100°F will not be used for cleaning purposes.

11.7.1.2 Recognition

All fires and visible smoke that are detected at the Site will be reported immediately to the SC/SERC and/or SHSO.

11.7.1.3 Response

In the event of visible smoke, fire or explosion, the SC/SERC will be notified immediately and the following emergency response procedures will be implemented:

- The SC/SERC will notify the SHSO and Contractor Site Safety Officer.

- Immediately cease operations.

- In all emergency situations the SC/SERC will contact Chicago Emergency by dialing 911.

- The SC/SERC will implement the appropriate emergency response signal. Use the designated emergency communication signals (1 horn blast = power equipment shutdown; 3 horn blasts followed by a continuous long blast = power equipment shutdown/evacuate work area).

- The SC/SERC will coordinate assistance from Site personnel, if needed.

- If it is safe to do so, remove or isolate flammable or other hazardous materials that may contribute to the fire.

- For larger fires, attempt to control the fire, to the degree possible, until off-site emergency response personnel arrive at the scene.

- Depending on the situation, perform Site evacuation and if necessary, implement notification procedures.

In all cases, an Incident Information Summary will be completed by the SC, or the SC's designee. The incident will be analyzed and appropriate modifications to work operations will be implemented, as needed.

11.7.2 Personnel Injury/Illness

11.7.2.1 Prevention

All Site personnel will abide by the provisions in this HASP during activities at the Site.

11.7.2.2 Recognition

All Site personnel who have potentially been exposed to Site contaminants, or have been exposed to Site contaminants without the use of respiratory protection or proper personal protection will report the exposure to the SHSO and to their supervisor. All injuries, even ones that are considered minor, will be reported to the SHSO. All personnel will observe each other for signs and symptoms of environmental stress.

Signs indicating potential environmental stress, including heat and cold stress, are listed below:

Heat Stress

- Profuse perspiration
- Muscle cramps in legs and abdomen (with pain accompanying cramps)
- Dizziness or faintness
- Loss of consciousness

Cold Stress

- Intense shivering
- Poor coordination or stumbling
- Muscle tensing
- Slurred speech
- Irrationality and poor judgment
- Blueness or puffiness of the skin
- Dilation of the pupils

11.7.2.3 Response

The SHSO and SC/SERC will be immediately notified of all injuries or exposure incidents. The SHSO, based on the information concerning the nature and cause of the injury, will initiate medical preparations. Off-site emergency medical assistance will be contacted by the SC/SERC or SHSO if needed. The Contractor's PM will be informed of the incident and will investigate the cause of the accident or injury and, if necessary, will revise work procedures to prevent recurrence of the accident or injury. In the event of an injury, prompt medical attention will be obtained.

In all emergency situations, decontamination will be conducted to the maximum extent appropriate without compromising the health and safety of the workers.

Upon identification of personal injury/illness, the following procedures will be implemented:

- Notify SC/SERC and SHSO of the injury/illness. Use designated on-site emergency communication signal (2 horn blasts = injured person).

- Assess the nature of the injury/illness.

- If ambulance transport is required and/or the victim is chemically contaminated, the SC/SERC must coordinate emergency assistance from Chicago Emergency. Table 11-2 contains instructions for contacting Chicago Emergency in the event of an emergency medical incident.

- If Site evacuation is necessary, implement the designated Site emergency alarm signal (3 horn blasts followed by a continuous blast). All Site personnel will assemble at a predesignated safe area on the evacuation route.

- If the injury is the result of chemical exposure, rescue attempts will be conducted in a level of personal protection higher than that of the victim.

- The victim will be decontaminated to the extent possible prior to being moved.

- If the injury or illness is the result of environmental stress, remove victim from extreme weather conditions.

- If the injury is not life-threatening and the victim can be safely moved, Site personnel will immediately remove the victim to the nearest first aid station in the decontamination area and appropriate first aid will be administered. Off-site emergency response teams will be contacted if additional rescue assistance or medical attention is required.

- If the victim cannot be safely moved (i.e., severe back or neck injury), CPR/first aid trained Site personnel will administer first aid and medical attention until off-site emergency response teams arrive. If the victim is in the EZ, off-site emergency response teams will use appropriate personal protective equipment and will be escorted to the victim by trained Site personnel. Site personnel will perform air monitoring to ensure that no further exposures occur. If possible, first aid and medical attention will be administered until additional off-site emergency response teams arrive.

- All accidents and injuries will be investigated by the SHSO. Other workers will not be allowed back into the EZ until the cause of injury or symptoms is determined. If the cause or nature of the incident does not affect the performance of Site operations, Site activities will continue.

- SHSO will fill out an Exposure/Injury Incident Report form.

11.7.3 Severe Weather Conditions and Other Events

Severe weather conditions include high winds, electrical storms and heavy rain. Other events that would result in implementation of ERP include adverse community activity (vandalism, threats, picketing, etc.).

11.7.3.1 Prevention

Preventive measures will be taken to secure the Site and Site personnel against other events such as severe weather conditions, natural disaster and adverse community activity. Weather conditions will be monitored. During severe weather conditions, preventive measures include securing temporary offices and storage facilities, grounding of buildings and electrical systems, and securing heavy equipment on the Site. A list of emergency equipment and materials that will be available on-site to secure the Site is provided as Table 11-4.

11.7.3.2 Recognition

Site personnel will be aware of forecasts of severe weather conditions in the immediate vicinity and at upstream and downstream locations. Weather reports will be monitored to identify and respond to impending weather conditions that would warrant additional diversion measures or Site evacuation. Visual observations of any indications of adverse community activities (threats, vandalism, pickets, etc.) will be reported immediately to the SC/SERC.

11.7.3.3 Response

Upon identification of severe weather conditions or adverse community activity:

- Notify SC/SERC.

- All work outdoors will cease during lightning in the area.

- If Site evacuation is necessary, evacuation alarm will be sounded (3 horn blasts followed by a continuous long blast), and if possible, all on-site equipment, buildings and supplies will be secured. All Site personnel will assemble at a predesignated safe area on the evacuation route.

- If the SC/SERC determines that severe weather conditions could threaten the health and safety of the local community, the SHSO will be contacted. In all cases, the SC, or the SC's designee will complete an Incident Information Summary. The incident will be analyzed and appropriate modifications will be incorporated as needed.

11.8 Evacuation Routes and Procedures

During the Site mobilization phase, safe locations for the purpose of Site evacuation will be identified. These locations will be indicated on the Site evacuation maps which will be posted in the Support Zone and throughout the Site. Site evacuation routes are provided on Figure 11-2. As part of the Site orientation, all on-site personnel will be informed of the evacuation plan.

Upon hearing the Site evacuation signal (3 horn blasts followed by one continuous blast), personnel will determine wind direction. Whenever possible, evacuation should be in the direction perpendicular to the wind direction without passing through the plume or smoke cloud. Personnel will report to a safe upwind or upgradient location. Site personnel in the EZ should exit through the contamination reduction zone (CRZ) and check out at the Access Control Point, if possible, as a means of accounting for Site personnel. If the SC is not involved in emergency response activities, he/she will assist in accounting for all Site personnel.

11.9 Followup Procedures

Post-incident investigations will be conducted by the SHSO to discover quickly the exact circumstances and cause of the incident. Amendments to the HASP will be approved and implemented by the SHSO, as needed. All Site personnel will be informed of any revisions prior to returning to their Site functions.

The necessary steps to ensure that operations can safely resume and the Site or work area is safe for worker entry include:

- Inspect area and equipment to establish if the Site is safe for operations to resume. Ensure that all emergency equipment (fire extinguisher, communication system, first aid kits and first aid station) is in functional order.

- Clear all incident-caused debris from the Site.

- Check electrical equipment, water supply and other utilities to ensure functional order.

TABLE 11-1
Emergency Response Telephone Roster

GOVERNMENT AGENCY PERSONNEL	
United States Environmental Protection Agency - Region V	(312) 353-2000
Illinois Emergency Response	(312) 353-9295
Illinois Environmental Protection Agency	(217) 782-6760
ENVIRON (Program Coordinator)	
ENVIRON Corporation	
Program Coordinator - Allan DeLorme	(703) 516-2366 Office
Site Coordinator/SERC - Steve Dielman	(703) 516-2363 Office
Site Health and Safety Officer - Steve Dielman	(703) 516-2363 Office
Chair of ENVIRON's Health and Safety Technical Committtee - Mark Katchen, CIH	(714) 261-3645 Office
	(800) 946-4646 Page No.
	PIN: 8018129
OFF-SITE EMERGENCY RESPONSE AGENCIES	
Emergency Fire	911
Emergency Police	911
Emergency Medical	911
St. Francis Hospital	(708) 597-2000
Christ Community Trauma Center	(708) 425-8000
Non-Emergency Fire	(312) 347-1313
Non-Emergency Police	(312) 385-4131
OTHER EMERGENCY ASSISTANCE	
CHEMTREC	(800) 424-9300
National Response Center	(800) 424-8802
Poison Control Center	(800) 962-1253
Federal Emergency Management Agency	(202) 646-2400

TABLE 11-2

INSTRUCTIONS FOR CONTACT WITH
CHICAGO EMERGENCY (911)
For Emergency Medical Incidents, Emergency Fire Response, or Hazardous Materials Incidents

1. SM/SERC or designee **dial 911. Remember to speak SLOWLY and CLEARLY. Do NOT hang up first: let the dispatcher conclude the call.**

2. Provide the following information:
   - Location: Former Dutch Boy Site
     12042 South Peoria Street.
     Chicago, Illinois
   - Your name and phone number
   - Explain that this is a hazardous waste site

3. Describe nature of Incident:
   A. Emergency Medical Incident
      - How many victims
      - Type of incident - chemical exposure, physical injury
      - Assessment of victims' condition if known (whether victim is conscious/unconscious, breathing/not breathing, pulse/no pulse, nature of injuries, first aid measures used, etc.)
      - Where incident occurred (Support Zone, Exclusion Zone, etc.)
      - Contamination status of victims - have they been decontaminated
   B. Fire:
      - Location of Fire (Support Zone, Exclusion Zone, etc.)
   C. Hazardous Materials Incident:
      - This is a hazardous materials incident requiring dispatch of HAZMAT unit
      - Type of incident (fire, explosion, spill, etc.)
      - Type of material (specific chemicals or general description)
      - Whether there is also a Medical Emergency (see 3.A)

4. If incident happened in EZ and/or involves chemical contamination, ask for Basic Life Support personnel to be dispatched.

5. Give location of staging area: Access point on 120th Street, just west of Peoria Street.

6. SC/SERC must meet the emergency personnel at the staging area to brief them on the situation.

7. Do **NOT** allow volunteer personnel to enter the Site.

TABLE 11-3

INSTRUCTIONS FOR CONTACT WITH CITY OF CHICAGO FIRE DEPARTMENT (CCFD)

NON-EMERGENCY: COURTESY CALL

A courtesy call should be made to CCFD whenever any of the following happens on-site:

- medical incident in which the victim is transported to St. Francis Hospital by site personnel;
- on-site fire, chemical spill/release or other incident which is contained by Site personnel (off-site assistance not required).

1. Call the non-emergency phone number (708-385-4131). This number is in operation 24 hours/day.
2. Provide the following information:

- Your name
- Location: Former Dutch Boy Site
  12042 South Peoria Street
  Chicago, Illinois
- Explain that this is a courtesy call, not requiring assistance.
- Describe nature of incident, including:
  - Type of incident (medical, fire, spill, etc.)
  - Type of material involved (either specific chemical or general description
  - If medical incident, how many victims transported to hospital
  - Assessment of victims' condition)
  - Where incident occurred (Support Zone, Exclusion Zone, etc.)

TABLE 11-4
Emergency Telephone Numbers and Directions to Hospital

Emergency Telephone Numbers:

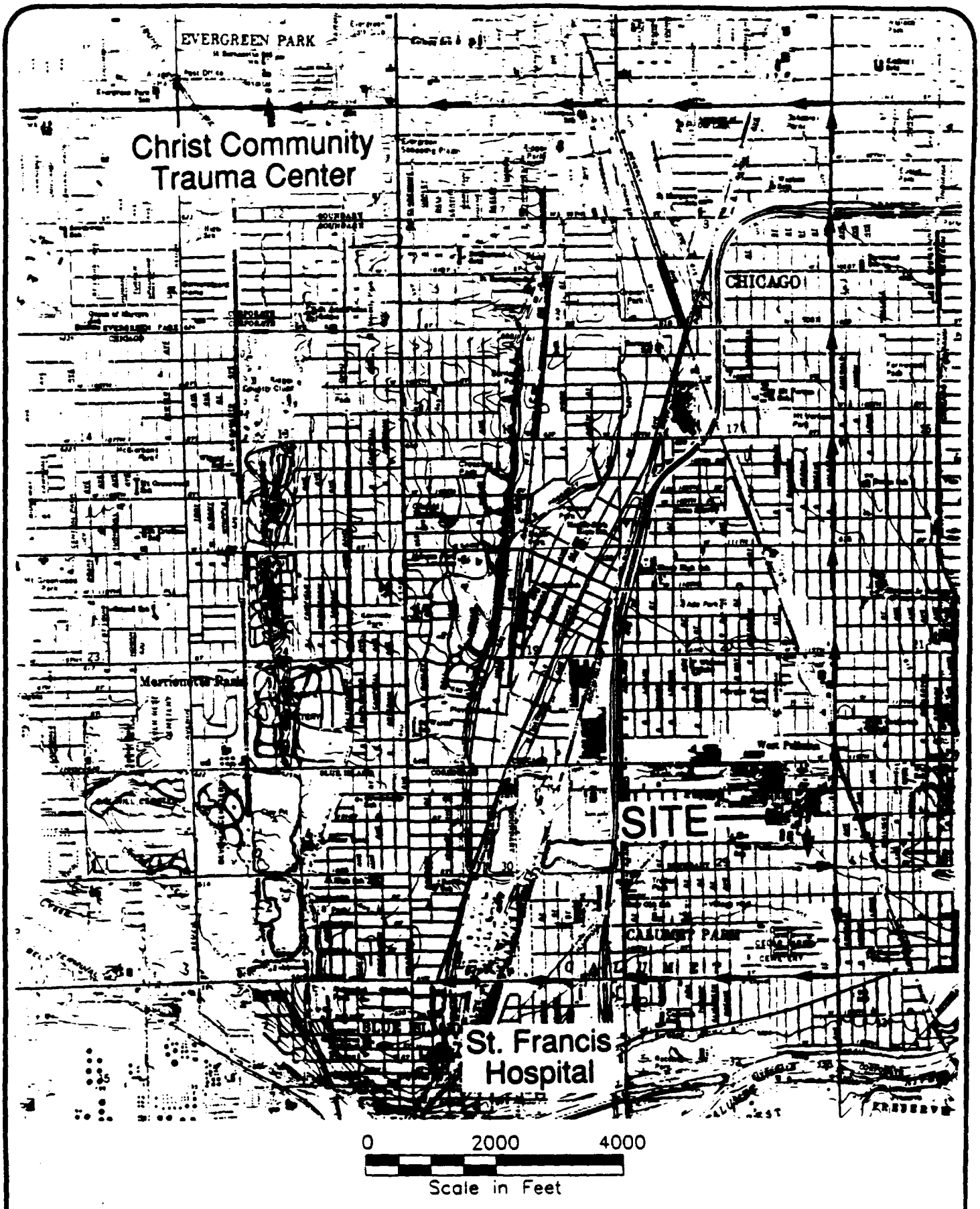
Chicago Emergency	911
St. Francis Hospital	(708) 597-2000
Christ Community Trauma Unit	(708) 425-8000
City of Chicago Police Department (non-emergency)	(708) 385-4131
City of Chicago Fire Department (non-emergency)	(708) 385-4131

Directions to St. Francis Hospital (Blue Island):

From the Site, go right (south) on South Peoria Street and travel for two blocks until the intersection with 123rd Street. Make a left (east) on 123rd St., and two blocks later make a right (south) onto Halsted Avenue. Continue for four blocks on Halsted until the intersection with 127th Street. Make a right (west) onto 127th Street. Go approximately 1.8 miles on 127th Street until passing over the railroad yard. Make a left (south) two blocks after the overpass onto South Gregory Street. St. Francis Hospital will be on the left after the church in about 4 blocks.

Directions to Christ Community Trauma Center (Evergreen Park):

From the Site, make a left (north) on South Peoria Street, and make an immediate right (east) onto 120th Street. Make the first left (north) onto Halsted Avenue. Travel north on Halsted for approximately 3 miles, and make a left (west) turn onto 95th Street (Route 12/20). After approximately 4.6 miles, Christ Community Hospital will be on the right.



SOURCE: USGS 7.5 MINUTE (TOPOGRAPHIC) SERIES; BLUE ISLAND, ILLINOIS QUADRANGLE

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MAP TO ST. FRANCIS HOSPITAL
AND CHRIST COMMUNITY HOSPITAL
DUTCH BOY SITE
CHICAGO, ILLINOIS

Figure
11-1

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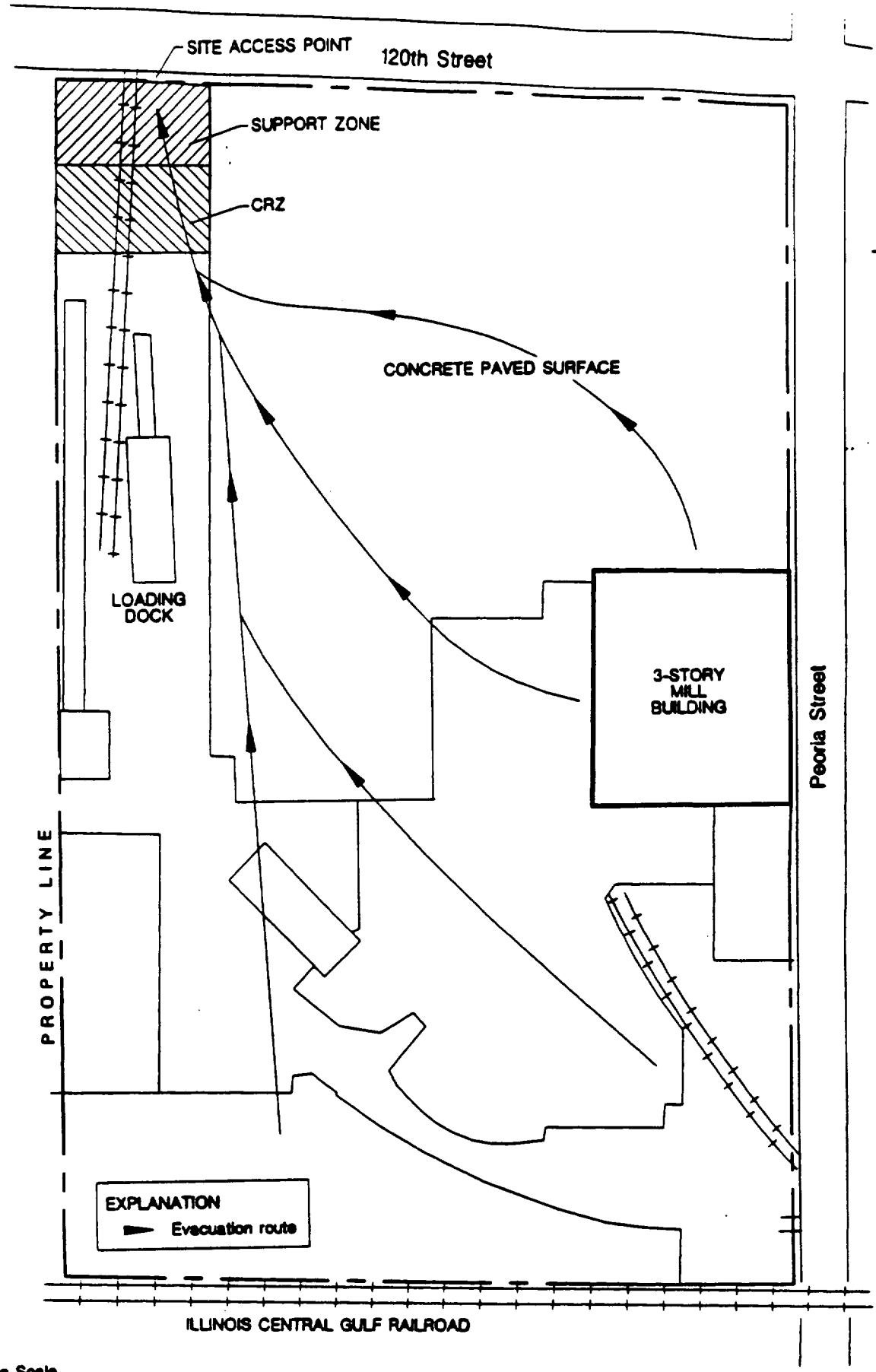

NOTE: Not to Scale

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SITE EVACUATION MAP
DUTCH BOY SITE
CHICAGO, ILLINOIS

Figure t1-2

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12.0 HEALTH AND SAFETY PLAN FIELD TEAM SIGNATURES

Sign off sheets for this plan are maintained by the SC.

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APPENDIX 1

Hypothermia and Frostbite

April 26, 1996

APPENDIX 1

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2.0	PREVENTION	App. 1-3
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April 26, 1996

HYPOTHERMIA AND FROSTBITE

1.0 SYMPTOMS

1.1 Hypothermia

Hypothermia is a condition in which the internal body temperature falls below 95°F (35°C). When exposed to cold temperature and/or cold water, the body reacts instinctively in a pattern designed to preserve itself. It resorts to involuntary reactions originating in the brain. When the brain recognizes any dangerous temperature drop in the body core, it signals the body to make adjustments to compensate for the imbalance. First, in an attempt to preserve normal temperatures in the vital internal organs, the blood vessels in the extremities constrict (vasoconstriction). This slows the blood flow to the arms and legs, preserving that energy and warm blood for the body core. If there is continued heat loss and if the body core temperature drops below 95°F (35°C), the body then tries to generate more heat through shivering, which causes metabolic heat production to increase to several times the normal rate. This is the first real warning sign of hypothermia. Further heat loss, accompanied by a body core temperature drop to 90°F (32°C) or below, results in the following symptoms:

- Speech difficulty;
- Loss of manual dexterity;
- Lethargy;
- Slow reactions;
- Mental confusion; and
- Muscle rigidity (muscle hypertonias).

If exposure continues further until the body's resources are exhausted and if the cold blood reaches the heart and the brain, heart failure and coma will result and lead inevitably to death. Death occurs when the body core temperature falls below 78°F (25°C).

Hypothermia damages both the body's internal temperature mechanisms (hypothalamus) and the peripheral mechanisms to prevent heat loss (vasoconstriction and perspiration). These effects may last up to three years.

1.2 Frostbite and Trench Foot

If exposure occurs in temperatures which are below freezing, frostbite or trench foot (immersion foot) may accompany or complicate the symptoms of hypothermia. Frostbite is the freezing of living tissues with a resultant breakdown of cell structure. Injury due to frostbite may cause obstruction of blood flow (ischemia) and blood clots (thrombosis) and may result in the following symptoms:

- Superficial redness of the skin (before skin becomes completely frozen);
- Dull pain;
- Slight numbness and blisters; and
- Skin discoloration (white, yellow-white or blue-white) when tissue becomes frozen.

Frostbite may occur if the skin comes into contact with objects whose surface temperature is below freezing, such as metal tool handles.

Trench foot is caused by continuous exposure to cold combined with persistent dampness or immersion in water. Injuries in this case include permanent tissue damage due to oxygen deficiency, damage to capillary walls, severe pain, blistering, tissue death and ulceration. Additionally, cold exposures may either induce or intensify vascular abnormalities. These include chilblain (a swelling or sore), Raynaud's disease, acrocyanosis (blains of hands and feet) and thromboangiitis (inflammation of the innermost walls of blood vessels with accompanying clot formation). Workers suffering from these ailments should take particular precautions to avoid chilling.

1.3 Predisposing Conditions

Susceptibility to cold injury varies from person to person. In general, people in good physical health are less susceptible to cold injury. Conditions which worsen the risk of cold injury are listed below:

- Old age;
- Diseases of the blood circulation system;
- Previous cold injury;
- Raynaud's disease;

- Fatigue;
- Consumption of alcohol or nicotine;
- Use of certain drugs or medication; and
- Injuries resulting in blood loss or altered blood flow.

2.0 PREVENTION

The following precautions will be taken if operations occur during cold weather.

- All outside operations will cease when the wind chill becomes -25°F or colder, or at the discretion of the Site Health and Safety Officer.

- Clothing good for dry cold conditions may include, but are not limited to:
  - layers of clothing;
  - snug-fitting "long johns";
  - pants and shirt;
  - socks should be made of wool, or acrylic and nylon knit;
  - boot should have a felt liner and be made of rubber, with safety toes;
  - insulated coveralls with hoods are preferable to coveralls without hoods; and
  - an outer cover of wind-resistant material. This suit shall also be resistant to chemical splashes.

- Wet cold clothing requirements:
  - clothing will be similar to the above, except outer clothes should be waterproof.

- Wear layers of loose, dry clothing.

- Avoid overheating. Remove clothing layers when starting to perspire.

- Stay dry.

- Perform periodic exercise to help keep the extremities warm.

- Do not touch frozen metal with bare skin.
- Avoid skin contact with evaporative liquids (gasoline, alcohol, etc.) below 4°C.
- Keep all exposed skin covered. Keep head covered at all times.
- Wear boots that are waterproof, with liners. Remove liners at night to let them dry.
- Use foot powder inside boots to absorb any moisture in boots.
- Use safety sunglasses with green or amber lenses on sunny days, to prevent snow blindness.
- Prevent hypothermia by staying warm and dry. Hypothermia occurs when the body loses heat faster than the body can replace it. Keep your head covered. The head will transmit 75% of the body's heat loss.

3.0 TREATMENT

If hypothermia occurs, certain first aid procedures can mean the difference between life and death for the victim. As a general rule, treat all injuries in the order of their importance to preserving life.

For Hypothermia, the goal is to stabilize vital functions and prevent further heat loss. First aid procedures include the following:

1. Give artificial respiration, if necessary, and stop any bleeding.
2. Bring the victim into a warm room or shelter as quickly as possible.
3. If the victim cannot be moved (spinal injury, etc.) carefully place newspapers, blankets or some other insulation between the victim and the ground.

4. Remove all wet clothing.

5. Provide an external heat source, because the body cannot generate its own heat. Wrap the victim in prewarmed blankets, place him or her in the liner of a portable hypothermia treatment unit, put the torso (not the extremities) into a tub of warm water or use body-to-body contact to rewarm the body core. These measures will slowly reopen the peripheral circulation so as to minimize the possibility of after-shock or after-drop (the flowing of cooled, stagnated blood from the limbs to the heart), which may cause ventricular fibrillation, cardiac arrest or death.

6. Do not allow the victim to sleep.

7. Give warm, sweet drinks - no alcohol or pain relievers.

8. Keep the victim still. Do not allow victim to try to walk.

9. Do not rub numb skin.

10. Get medical help as soon as possible.

For Frostbite:

1. Wrap the victim in woolen cloth and keep dry until he or she can be brought inside.

2. Do not rub, chafe or manipulate frozen parts. Handle frostbitten parts gently.

3. Bring the victim indoors.

4. Place the victim in warm water (102° to 105°F) and make sure it remains warm. Test the water by pouring it on the inner surface of your forearm. Never thaw affected parts if the victim has to go back out into the cold. The affected area may be refrozen.

5. Do not use hot water bottles or a heat lamp, and do not place the victim near a hot stove.

6. Do not allow the victim to walk if his or her feet are affected.

7. Have the victim gently exercise the affected parts once they are thawed.

8. Seek medical aid for thawing of serious frostbite, because the pain will be intense and tissue damage will be extensive.

APPENDIX 2

Heat Stress Prevention Program

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APPENDIX 2

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HEAT STRESS PREVENTION PROGRAM

1.0 GENERAL INFORMATION

Adverse climatic conditions are important considerations in planning and conducting Site operations. The effects of ambient temperature can cause physical discomfort, loss of efficiency, personal injury and increased accident probability. In particular, heat stress due to protective clothing decreasing body ventilation is an important consideration.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur, ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity, movement) to fatal. Standard reference books should be consulted for specific treatment.

Heat-related illness can take various forms, described below.

1.1 Heat Rash

Heat rash ("prickly heat") is characterized by profuse, tiny, raised red vessels and a pricking sensation during heat exposure. It is caused by continuous exposure to heat and humid air and aggravated by not changing clothes. Heat rash decreases the ability to tolerate heat as well as being a nuisance.

1.2 Heat Cramps

Heat cramps (painful spasms of muscles) usually affect people who work in hot environments and perspire a great deal. The loss of salt from the body causes very painful cramps, usually of the leg and abdominal muscles. Heat cramps may also result from drinking iced water or other drinks either too quickly or in too large a quantity. The symptoms of heat cramps include:

- Muscles cramps in legs and abdomen;
- Pain accompanying cramps;
- Faintness; and
- Profuse perspiration.

1.3 Heat Exhaustion

Heat exhaustion occurs in individuals working in hot environments; this disorder may be associated with heat cramps. It is brought about by the pooling of blood in the vessels of the skin. The heat is transported from the interior of the body to the surface by the blood. The skin vessels become dilated and a large amount of blood is pooled in the skin. This condition, plus the blood pooled in the lower extremities when in an upright position, may lead to an inadequate return of blood to the heart and eventually to physical collapse. Predisposing factors include sustained exertion in hot environment, lack of acclimatization and failure to replace water lost in sweat.

The symptoms of heat exhaustion include:

- Weak pulse;
- Rapid and usually shallow breathing;
- Generalized weakness and fatigue;
- Cold, pale, clammy skin;
- Nausea or headache;
- Profuse perspiration;
- Dizziness;
- Unconsciousness; and
- Appearance of having fainted (the patient responds to the same treatment administered in cases of fainting).

1.4 Heat Stroke

Heat stroke is a profound disturbance of the heat-regulating mechanism, associated with high fever and collapse. Sometimes this condition results in convulsions, unconsciousness and even death. Direct exposure to sun, poor air circulation, poor physical condition, dehydration, and advanced age (over 40) bear directly on the tendency towards heat stroke. It is a serious threat to life and carries a 20 percent mortality rate. Alcoholics are extremely susceptible because of reduced fitness and the water-losing (diuretic) effects of alcohol. The symptoms of heat stroke are as follows:

- Sudden onset;
- Change in behavior;

- Confusion;
- Dry, hot and flushed skin;
- Dilated pupils;
- Early loss of consciousness;
- Full and fast pulse;
- Breathing deep at first, later shallow and even almost absent;
- Muscle twitching, growing into convulsions; and
- Body temperature reaching 105°F or higher.

2.0 SCOPE OF PROGRAM

This program applies to all operations at the Dutch Boy Site. The Heat Stress Prevention Program (HSPP) will be activated whenever any of the conditions in Section 4 below are met.

3.0 PROGRAM ADMINISTRATION

The Project Health and Safety Coordinator is the Administrator of the HSPP and has the following responsibilities:

- Develop and implement this program.
- Provide training as described in Section 6.
- Recommend preventive measures.
- Implement monitoring when necessary.
- Maintain records.

For field operations, the Site Health and Safety Officer (SHSO) will have the responsibility for the three latter duties.

4.0 CONDITIONS FOR PROGRAM ACTIVATION

The HSPP will be activated whenever any of the following conditions are met:

- Whenever the dry bulb temperature is above 60°F and workers are wearing protective clothing.

- Whenever the dry bulb temperature is above 70°F and the workers are wearing normal work clothes.

  Note: The daily temperature/weather conditions and the next day forecasted temperature will be recorded from March 1 through October 31 to determine if activation is required or may be required per the above conditions.

- Whenever professional experience indicates that heat stress is likely because of a combination of work activity and clothing ensemble.

- Whenever employee symptoms and/or complaints indicate heat stress.

If any of the first four conditions are met, then preventive measures as described in Section 5.1 below must be implemented. If the HSPP is activated because of the last condition, then preventive measures and employee monitoring as described in Section 5.2 must both be implemented.

5.0 PROGRAM IMPLEMENTATION

5.1 Preventive Measures

Preventive measures will be the first step in the implementation of the program. Effective implementation of the measures described below should prevent the onset of heat stress symptoms in most situations. The approach selected to prevent heat stress will usually involve combining one or more of the following measures:

- Allow workers to become acclimatized to working in hot environments.

  The degree to which a worker's body is physiologically adjusted or acclimatized to working under hot conditions affects his or her ability to do work. Acclimatized individuals generally have lower heart rates and body temperatures than unacclimatized individuals, and sweat sooner and more profusely. This enables them to maintain lower skin and body temperatures at a given level of environmental heat and work loads than unacclimatized workers.

Acclimatization can occur after just a few days of exposure to a hot environment. NIOSH recommends a progressive 6-day acclimatization period for the unacclimatized worker before allowing him/her to do full work on a hot job. Under this regimen, the first day of work on-site is begun at 50% of the anticipated workload and exposure time and 10% is added each day through Day 6. With fit or trained individuals, the acclimatization period may be shortened 2 or 3 days. However, workers can lose acclimatization in a matter of a few days and work regimens should be adjusted to account for this.

- Reduce manual labor by mechanization of tasks. Using a backhoe instead of shoveling, and using a crane to lift or move drums are examples of how mechanization can be used to reduce heat stress.

- Modify the thermal environment. Control of radiant heat gain is best accomplished by shielding. An example would be an umbrella to shade the worker from the sun (e.g., commercially available umbrellas for heavy equipment operators). Reducing heat gain from convection may be accomplished by supplying cooler air to the work environment. At a minimum, break areas, locker rooms and lunch rooms should be located in shaded areas.

- Cooling devices, such as vortex coolers or cool vests, may be worn under suits.

- If possible, the rest area should be maintained at a temperature of approximately 77°F.

- Modify clothing requirements to reduce the amount of time an employee is in full protective clothing.

- Require frequent changing of clothing and daily showering to avoid heat rash.

- Maintain worker's body fluids at normal levels. Water and drinks such as Gatorade (50° to 60°F) should be available to employees so that fluid lost by sweating is replaced. Daily fluid intake must approximately equal the amount

of water lost in sweat. Employees should be encouraged to drink more fluids when working in hot environments.

- Reduce the amount of time employees are working in a hot environment. Work/rest periods should be developed according to professional experience. Scheduling heavy workloads for a cooler part of the day is another successful method.

IF PREVENTIVE MEASURES ARE NOT EFFECTIVE IN REDUCING HEAT STRESS, AS EVIDENCED BY HEAT STRESS ILLNESSES AND/OR EMPLOYEE COMPLAINTS, THEN WORKER MONITORING IS REQUIRED. IN ADDITION, INFORMAL TRAINING IS REQUIRED AND THE PREVENTIVE MEASURES MUST BE REEVALUATED.

5.2 Worker Monitoring

Monitoring for heat stress will be required when any of the following conditions are met:

- A complaint about heat stress is received; or
- Heat stress illness is apparent.

Any employee(s) who filed complaints will be the initial candidate(s) for monitoring. The following monitoring will be conducted:

- Monitoring of oral temperature/heart rate for employee(s) who complained. (See Attachment 1 for temperature and heart rate monitoring instructions. The instructions define the frequency and duration of each type of monitoring.)

Once monitoring is begun, it will be made available to all employees upon request.

If a recordable heat stress illness as defined by OSHA occurs:

- Remove the individual from work and provide medical attention, if indicated.
- Reduce the work cycle for other workers in the operation.

- Oral temperature and heart rate monitoring will be performed on the affected employee.

6.0 TRAINING

The Program Administrator will train all personnel annually. Short presentations may also be given by the SHSO as a part of Site safety orientations.

The formal training will inform workers and supervisors about the fundamental issues of heat stress, which include:

- Heat exchange and thermophysiology;
- Heat stress hygiene;
- Heat illness;
- Countermeasures;
- Recognition of signs and symptoms of heat stress;
- Awareness of signs and symptoms;
- Methods to prevent heat stress;
- Maintaining body fluid levels;
- Physical fitness;
- Self determination;
- Acclimatization; and
- First aid measures for heat stress.

See Attachment 3 for a complete outline of the heat stress training program.

The Program Administrator should contact the Health and Safety Technical Committee for supplemental training information on heat stress.

7.0 EMERGENCY RESPONSE

7.1 Heat Cramps

To provide emergency care for heat cramps, remove the patient to a cool place. Give patient sips of liquids such as Gatorade or its equivalent. Apply manual pressure to the cramped muscle. Remove the patient to a hospital if there is any indication of a more serious problem.

7.2 Heat Exhaustion

To provide emergency care for heat exhaustion, remove the patient to a cool place and remove as much clothing as possible. Administer cool water, Gatorade or its equivalent. It is a good idea to dilute each part of Gatorade with one or two parts of water. If possible, fan the patient continually to remove heat by convection, but do not allow chilling or overcooling. Treat the patient for shock, and remove to a medical facility if there is any indication of a more serious problem.

7.3 Heat Stroke

When heat stroke occurs, a MEDICAL EMERGENCY exists. It is caused when the body's temperature and regulatory system breaks down.

Transportation to a medical facility should not be delayed. Remove the patient to a cool environment if possible, and remove as much clothing as possible. Assure an open airway. Reduce body temperature promptly by dousing the body with chilled water, or preferably by wrapping in a wet sheet. If cold packs are available, place them under the arms, around the neck, at the ankles, or any place where blood vessels that lie close to the skin can be cooled. Protect the patient from injury during convulsions, especially from tongue biting.

8.0 DOCUMENTATION

All records shall be maintained by the Program Administrator for one year.

9.0 PROGRAM EVALUATION

The effectiveness of the HSPP shall be evaluated at least annually by the Program Administrator. The evaluation should include a review of the written program, control measures implemented, employee benefit resulting from the program, and the effectiveness of the program to reduce the occurrence of heat stress related illnesses.

ATTACHMENT 1
of Appendix 2

Worker Monitoring Procedures

April 26, 1996

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WORKER MONITORING PROCEDURES

1.0 MONITORING

1.1 Monitoring Responsibilities

The SHSO and individual contractor SHSO's will be responsible for the monitoring of worker performance and the signs and symptoms of heat stress or heat exhaustion when the dry bulb temperature exceeds 60 degrees Fahrenheit. On these days, the individual contractors HSOs will be responsible to assure that clean, cool water, or an electrolyte replenishment solution is readily available to all site personnel. In addition, the SHSO's will provide daily safety briefings on the effects of excessive heat exposure and the signs and symptoms of heat stress. The contractor SHO is responsible for reporting to the SHSO immediately upon report and/or detection of the signs or symptoms of heat stress/exhaustion. Monitoring for physiological indication of heat stress and/or heat exhaustion will be performed subsequent to the detection of signs/symptoms of exposure or at the digression of the individual contractors SHO. Monitoring for heat stress/exhaustion will include heart rate monitoring and/or oral temperature monitoring.

1.2 Heart Rate Monitoring

Upon report and/or detection of a sign or symptoms of heat stress/exhaustion the contractor SHO will perform heart rate monitoring. Heart rate monitoring will be performed by counting the radial pulse during a 30-second period as early as possible after report of the signs or symptoms.

If the heart rate exceeds 110 beats per minute, the worker should be provided an adequate rest period to reduce the heart rate to below 110 beats per minute. Subsequent to this rest period, the worker may return to work provided the workers next work cycle is reduced by one-third, without any change to the rest period following this work cycle. Upon completion of the work cycle, the workers radial pulse should be counted again. If the heart rate continues to exceed 110 beats per minute, the following work cycle should be reduced by one-third. Cases where personnel demonstrate continual elevated heart rates will be evaluated by the contractor SHO and the PRP Group Health and Safety Technical Committee.

1.3 Oral Temperature Monitoring

When the heart rate exceeds 110 beats per minute, the oral temperature of the worker should be measured. Oral temperature should be monitored by use of a clinical thermometer or similar device (such as an IVAC digital thermometer or an infrared thermometer) being placed under the tongue for a period of 3 minutes. If the workers oral temperature exceeds 99.6 F, the worker should be allowed to rest until the temperature drops below 99.6 F. Once this is achieved, the worker may be allowed to return to work provided that the next work cycle is reduced by one-third, without a reduction in the rest period. Upon completion of this work cycle, the workers body temperature should be re-evaluated immediately, and particularly, prior to consumption of water or electrolyte replenishment solutions. If the workers oral temperature still exceeds 99.6 F, the following work cycle should again be reduced by one-third. No personnel will be permitted to wear semi permeable or impermeable PPE if their oral temperature exceeds 100.6 degrees Fahrenheit.

2.0 CONTROL MEASURES

2.1 Heart Rate

If the heart rate exceeds 110 beats per minute, shorten the next work cycle one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

2.2 Oral Temperature

- If the oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period.

- If the oral temperature still exceeds 99.6°F, at the beginning of the next rest period, shorten the following work cycle by one-third.

- DO NOT PERMIT A WORKER TO WEAR A SEMI-PERMEABLE OR IMPERMEABLE GARMENT WHEN HIS/HER ORAL TEMPERATURE EXCEEDS 100.6 DEGREES FAHRENHEIT.

3.0 RECORDKEEPING

The monitoring results shall be recorded, and the records maintained by the Program Administrator for one year. A daily log shall be completed and a copy included in each worker's medical file.

4.0 EMPLOYEE NOTIFICATION

Employees will be notified by the Program Administrator of the monitoring results contained in the daily log and their significance. In addition, the notification to affected employees will describe how heat stress will be controlled.

ATTACHMENT 2
of Appendix 2

Definitions

April 26, 1996

DEFINITIONS

Administrator - A person trained to recognize potential heat stress environments and illnesses, and responsible for implementing the heat stress prevention program.

Acclimatization - The physiological changes that occur in response to a succession of days of exposure to environmental heat stress and reduce the strain caused by the heat stress of the environment.

Body Heat Balance - Steady-state equilibrium between body heat production and heat loss to the environment.

Convective Heat Transfer - The net heat exchange by convection between an individual and the environment.

Evaporative Heat Loss - Body heat loss by evaporation of water (sweat) from the skin.

Heat Disorder - A general term used to describe the illnesses associated with excessive heat exposure.

Heat Stress - The combination of environmental and physical work factors that constitute the total heat load imposed on the body. Environmental factors such as air temperature can affect the body's heat transfer capability. Then, if the worker must perform strenuous work under unfavorable ambient conditions, heat stress conditions exist.

Metabolism - Transformation of chemical energy into energy that is used for performing work and producing heat.

Pressure, Water Vapor - The pressure exerted by the water vapor in the air.

Radiant Heat Exchange - Heat exchange by radiation between two radiant surfaces of different temperatures.

Temperature, Ambient - The temperature of the air surrounding a body. Also called air temperature or dry bulb temperature.

Temperature, Dry Bulb - The temperature of air as registered by a thermal sensor such as a mercury-in-glass thermometer shielded from direct radiant energy sources.

Temperature, Globe - The temperature inside a blackened, hollow, thin copper globe measured by a thermometer whose sensing element is in the center of the sphere.

Temperature, Radiant - The point temperature of the surface of a material or object.

Temperature, Oral - Temperature measured by placing the sensing element under the tongue for a period of 3 to 5 minutes.

Temperature, Psychometric Wet Bulb - The lowest temperature to which the ambient air can be cooled by evaporation of water from the wet temperature sensing element with forced air movement.

Temperature, Natural Wet Bulb - The wet bulb temperature under conditions of the prevailing air movement.

Thermal Insulation, Clothing - The insulation value of a clothing ensemble.

Work Clothing - Impermeable - Semi-permeable or impermeable encapsulating ensembles such as disposable Tyvek and Saranex coveralls, respectively. When enclosed in an impermeable suit, fit, acclimatized individuals sweat more profusely than unfit or unacclimatized individuals and may therefore actually face a greater danger of heat illnesses due to rapid dehydration. This can be prevented by consuming adequate quantities of water.

Work Clothing - Normal - Permeable clothing made of cotton or synthetic cloth.

Workers - Persons who are working (exerting energy) in a heat stress environment.

ATTACHMENT 3
of Appendix 2

Training Program Outline

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TRAINING PROGRAM OUTLINE

The Program Administrator will present himself/herself, or designate a trainer, to give training in heat stress. This training will be given to all personnel that may be working in heat stress environments.

An outline of the presentation is provided below:

I. Interactions with Hot Jobs

A. Heat Transfer

1. Metabolism (M): Heat gained in relation to the amount of work performed.
2. Convection (C): Heat gain from the air (if Tdb > 97°F) or loss to air (if Tdb > 97°F).
3. Radiation (R)
   a. Heat gain from hot sources
   b. Heat loss to walls, floors, etc. that are less than 97°F.
4. Heat Balance:
   a. Sum of Sources: M + C + R
   b. If sum is greater than zero, sweating is required.
   c. Sweating evaporates on skin to cool the person.
   d. Effects of clothing.

B. Physiological Responses

1. Heart rate increases to pump hot blood to skin to dissipate heat.
2. Body temperature increases.
3. Sweating increases to meet cooling requirements.
   a. Limited to 1 liter per hour and by clothing and humid environments.
   b. The body loses water, which must be replaced.
4. Acclimation
   a. Adaptation to Heat Stress

b. Ability to sweat increased and, therefore, more evaporative cooling.

c. Lower heart rates and body temperature and, therefore, better ability to work.

5. Work Patterns

a. Steady, evenly paced work less stressful than the same work done in intensive spurts with rest pauses.

b. Effects of heat stress accumulate if there is not enough recovery time.

II. Heat Stress Hygiene

A. Fluid Replacement

1. Water must be replaced

2. Replacement with up to 1 liter (1 quart) per hour.

a. Thirst is not an adequate indicator

b. Drinking (8 oz) every 15 to 20 minutes is best.

c. Prehydration for work in radiation control areas (about 1 pint per hour of work).

3. No evidence found that commercial replacement fluids improve performance or tolerance to heat if person has a proper diet and replaces lost water.

B. Self-Determination

1. Cessation of work with the appearance of symptoms of heat illness.

a. Make work area safe.

b. Inform fellow worker(s) and/or supervisor before leaving.

c. Recover in cool area and drink fluids.

2. Adjustment of work pattern (if and when possible)

a. Work effort should be even and steady rather than in spurts of high activity.

b. Low effort if heart rate is beating quickly (> 150 bpm).

C. Diet and Salt

1. Avoid fad diets for weight reduction

2. Balanced diet

3. Salt Replacement
   a. Ordinary intake is usually sufficient
   b. Follow instructions of physician if on a salt-restricted diet.

D. Acclimation
1. Modify expectation every 5 days to adjust to higher levels of heat stress.
2. Loss of acclimation
   a. Without exposure
   b. Illness

E. Life Style
1. Alcohol
   a. Dehydrates the body and lessens the ability to sweat.
   b. Inhibits the thermoregulatory system and reduces tolerance.
   c. Increases chances of heat stroke.
2. Drugs
   a. Affect the thermoregulatory system and reduces heat tolerance.
   b. Increase the risk of heat stroke.
3. Extramural Jobs or Activities
   a. Avoid work, hobbies, etc. that may require effort in hot environments before work.
   b. Activities before work may cause you to start work with increased body temperature.
   c. Following work, activities should be started only after full recovery from work has been achieved.
4. Adequate Sleep
   a. Chronic Illnesses. Follow recommendations once physician has been informed of your occupation and heat exposure requirements. Diseases of special concern are those in:
      - Cardiovascular System
      - Kidneys (renal function)

- Lungs
- Liver/pancreas

b. Acute Illness: Report illnesses accompanied by fever, such as viral and bacterial infections; illnesses that caused diarrhea, vomiting, or other losses of water; skin rashes or sunburn that covers more than 10% of the skin surface.

III. Heat Disorders and First Aid

A. Heat Cramps

1. Cause: Hard work and profuse sweating.
2. Symptoms: Painful cramps in active muscles, and muscle twitches in legs, arms, and/or abdomen.
3. First Aid: Drink fluids.

B. Heat Faintness

1. Cause: Staying in one position or posture under conditions of heat stress, especially standing quickly after sitting or lying down.
2. Symptoms: Weakness, blurred vision, pallor, and/or fainting.

C. Heat Exhaustion

1. Cause: Usually a net loss of water due to sweating or an illness (e.g., vomiting, diarrhea, alcohol ingestion).
2. Symptoms:
   a. Dry mouth and excessive thirst.
   b. Concentrated urine (darker, more yellow than normal).
   c. Headache and/or dizziness.
   d. Fatigue and weakness.
   e. Uncoordinated actions and slow reflexes.
3. First Aid: Move to cool environment, stay in recumbent position, and drink fluids. Refer to Program Administrator.

D. Heat Stroke: MEDICAL EMERGENCY

1. Causes: Central nervous system (CNS) failure and/or sustained overexposure to heat stress. CNS failure can be caused by disease or drug/alcohol abuse.
2. Symptoms

a. Dry skin and/or chills.

b. Irrational and/or other atypical behavior.

c. Sudden onset of pain or convulsions.

d. Unconsciousness.

3. First Aid

a. Get immediate medical attention; call an ambulance.

b. Cool person immediately with cold water or ice or an alcohol rinse and fan.

IV. Countermeasures

(Must tailor this to Site policies, procedures and countermeasures).

A. List engineering controls, administrative controls and personal protection in use.

B. Describe each countermeasure in use.

1. Explain why it works.

2. Explain how to use it.

3. Emphasize proper use, benefits and limitations.

APPENDIX 3

Exposure/Injury Incident Report

April 26, 1996

DUTCH BOY SITE
Exposure/Injury Incident Report

Name of injured person: _____

Company Name and Address: _____

Age: _____ Sex: _____ SSN: _____

Summary of incident: (Provide details and parts of body affected.)

_____

_____

_____

_____

Type of incident: Possible chemical exposure _____ Physical incident _____ Other _____

Chemical name and form (liquid, solid, gas, fume, mist) _____

Date of incident: _____ Time of incident: _____

Incident first reported to: _____

Weather conditions at time of incident: (temperature, precipitation, wind speed, and direction)

_____

_____

Was medical care provided on-site? Yes _____ No _____

If yes, when and where was care provided? _____

_____

By whom: _____

If "off-site" care was provided, provide name and location of health-care facility:

_____

_____

Exposure/Injury Incident Report (continued)

Nature of care at the health-care facility: _____

Was the Site Health and Safety Officer contacted? Yes _____ No _____

If no, who was contacted? _____

Has the employee returned to work? Yes ____ No ____
If yes, on what date? _____

Provide names of persons who witnessed the exposure/injury incident.

_____

Was the activity being performed under a Health and Safety Plan?
Yes ____ No ____ If yes, attach a copy of the plan.

Provide a list of any personal protective clothing and equipment used by the employee at the time of the exposure/injury incident.

_____

Did any aspect of personal protective clothing and equipment contribute to the exposure/injury incident?

Yes ____ No ____ If yes, please explain. _____

_____

Are measures available that may help to prevent a repeat of a similar exposure/injury accident?

Yes ____ No ____ If yes, please explain. _____

_____

Describe property damage, if applicable: _____

_____

Exposure/Injury Incident Report (continued)

Name, job position, office location of individual(s) completing this exposure/injury incident report.

_____

_____ Date: _____
Site Coordinator Signature

_____ Date: _____
Employee Signature

_____ Date: _____
Site Health and Safety Officer Signature

_____ Date: _____
Corporate Health and Safety Officer Signature

APPENDIX 4

Incident Information Summary

April 26, 1996

DUTCH BOY SITE
Incident Information Summary

Date: _____ Time: _____

Name, title, phone number of reporting person: _____

_____

Location of incident: _____

_____

Date & time of incident: _____

_____

Summary of incident: _____

_____

_____

_____

_____

List of hazardous material released (include present physical state, characteristics of material, approximate quantity): _____

_____

_____

Causes of the incident: _____

_____

_____

Medical treatment (number of injured; medical treatment; where injured were taken):

_____

_____

Incident Information Summary (continued)

Weather conditions (wind direction, odor of vapor clouds or plumes)

_____

_____

List of personnel on scene: _____

_____

_____

Effect of incident on contract schedule: _____

_____

Corrective actions taken to ensure future safety and security: _____

_____

_____

Other damage or injuries sustained (public or private): _____

_____

_____

_____ _____

Signature of Reporting Person Title and Organization

APPENDIX 5

Hazard Communication

April 26, 1996

APPENDIX 5

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April 26, 1996

ATTACHMENTS

Attachment 1:	29 CFR 1910.120
Attachment 2:	Chemical Lists
Attachment 3:	Information Acknowledgment Form
Attachment 4:	Hazard Communication Training Program

April 26, 1996

HAZARD COMMUNICATION

1.0 PURPOSE

The purpose of the Hazard Communication Program is to define a program which will assure that personnel are aware of the potential hazards of the materials with which they work. This program is designed to meet the requirements of OSHA 29 CFR 1910.1200 and applicable state and/or federal regulations.

2.0 SCOPE

This program applies to all operations at the Dutch Boy Site (the Site). The program meets the requirements of OSHA 29 CFR 1910.1200 and applicable state and/or federal regulations. It does not address the emergency planning, reporting requirements, and toxic chemical emissions reports required by the Emergency Planning and Community Right-to-Know Act (EPCRA), which is commonly referred to as Title III of the Superfund Amendments and Reauthorization Act (SARA).

3.0 ADMINISTRATION

3.1 Program Administrator

The Health and Safety Coordinator is the Administrator of the Hazard Communication Program. The Program Administrator has the overall responsibility for development, implementation, and periodic review of the program. The Program Administrator will have all recordkeeping and program maintenance responsibility unless otherwise specified.

3.2 Site Health and Safety Officer (SHSO)

The SHSO will be responsible for observing compliance with all the site-specific requirements of this program. These requirements include maintaining lists of hazardous substances or materials used at the Site; maintaining updated Material Safety Data Sheets (MSDSs) for these materials and generic MSDSs for waste contaminants found on-site; training

Site personnel in the hazards of Site materials and methods of detection; and monitoring compliance with label requirements.

4.0 REGULATIONS

4.1 Federal

Attachment 1 contains a copy of OSHA Regulation 29 CFR 1910.1200. This regulation contains the basic requirements for this program.

5.0 HAZARD DETERMINATION

All substances handled at the Site are considered to be hazardous according to the criteria of the federal Hazard Communication Standard unless determined to be non-hazardous by the Program Administrator (as described below) or by the supplier of the substance.

The Program Administrator will consult with appropriate personnel before determining a substance to be non-hazardous. The criteria specified in Subsection (d), Appendix A, and Appendix B of 29 CFR 1910.1200 will be used for making the hazard determination.

6.0 CHEMICAL LISTING

The on-site SHSO Contractor is responsible for maintaining a list of any hazardous materials brought on the Site.

7.0 MATERIAL SAFETY DATA SHEETS

The SHSO Contractor has the responsibility for:

- Ensuring that MSDSs are received for any chemicals received at the Site. If the MSDS is not received prior to or upon receipt of shipment, the manufacturer or distributor will be contacted via phone. A follow-up letter will be issued to the manufacturer or distributor if requested.

- Dating all MSDSs upon receipt.

- Obtaining an updated copy of the MSDSs if the copy on file is more than two years old. The MSDS file will be reviewed every six months. This review will include checking

the date of issue on the MSDS, and a check to ensure that all required MSDSs are on file.

- MSDSs will be available at the Site administrative or health and safety offices. Personnel wishing to review a copy of an MSDS should contact the SHSO. If a copy is requested, MSDSs will be provided within 5 working days. The SHSO will review the MSDS(s) with the employee when it is provided. If the SHSO cannot answer any of the employee's concerns about the material, or if the employee is not completely satisfied with the information provided, the SHSO should contact the Program Administrator for assistance.

Profile sheets will be used to identify the hazardous components of RCRA wastes. Commercially provided generic MSDSs will be used for information on the chemicals identified on the profile sheets. The following reference books will be used:

- Condensed Chemical Dictionary
- Dangerous Properties of Industrial Chemicals
- NIOSH Pocket Guide to Chemical Hazards
- Merck Index
- Genium Publishing Corporation Material Safety Data Sheets

In addition, the National Library of Medicine TOXNET Database will be utilized for information on hazardous chemicals, as needed.

8.0 LABELING

All RCRA wastes will be labeled according to RCRA and DOT regulations.
The SHSO is responsible for ensuring compliance with the following labeling requirements:

- RCRA labeling of stored wastes;
- Labeling of shipped containers;
- Labeling on-site containers into which received materials have been transferred, except those used solely by the person performing the transfer in a single day; and
- Maintaining labels on received containers in a legible state.

9.0 TRAINING

The SHSO will have the responsibility of training personnel on the potential hazards which might be encountered at the Site.

Personnel will be trained in hazard communication:

- Annually;
- During orientation; and
- When new information is available on the hazards of a chemical.

Contractors will be trained on the hazards of the chemicals which they might encounter in the workplace.

The hazards of non-routine tasks will be addressed by the SHSO and Coordinator for review and approval by the Health and Safety Coordinator. Training in these hazards will be conducted by the SHSO just prior to beginning the task.

Training will include the following:

- The contents of this program, annually.

- A discussion of the requirements of the Hazard Communication Standard, annually.

- The physical and health hazards of the specific chemicals to be handled at the Site, to be discussed during Site orientation. The hazards of general classes of chemicals will be discussed during the 40-hour basic safety course and annually. This will include a discussion of the acute hazards, chronic hazards, and warning properties of the specific chemicals or classes of chemicals listed.

- Methods to detect the presence or release of hazardous chemicals in the work place during Site orientation and if new chemicals are received.

- Personnel access to this program and the information described within the program, annually.

Attachment 4 contains a copy of the training program.

Training in the methods of protection from the hazards of chemicals will be covered by training conducted for the PPE Program, Respiratory Protection Program, and Standard Operating Procedures.

10.0 PROGRAM UPDATE

This program will be reviewed and updated at least annually. All evaluations will be maintained with the written program.

ATTACHMENT 1
of Appendix 5

29 CFR 1910.1200

1910.1200 Hazard communication.

(a) Purpose. (1) The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

(2) This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or political subdivision of a state, pertaining to this subject. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures. Under section 18 of the Act, no state or political subdivision of a state may adopt or enforce, through any court or agency, any requirement relating to the issue addressed by this Federal standard, except pursuant to a Federally-approved state plan.

(b) Scope and application. (1) This section requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this section requires distributors to transmit the required information to employers. (Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers. Appendix E of this section is a general guide for such employers to help them determine their compliance obligations under the rule.)

(2) This section applies to any chemical which is known to be present in the workplace in such a manner that employees

may be exposed under normal conditions of use or in a foreseeable emergency.

(3) This section applies to laboratories only as follows:

(i) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(ii) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible during each workshift to laboratory employees when they are in their work areas;

(iii) Employers shall ensure that laboratory employees are provided information and training in accordance with paragraph (h) of this section, except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section; and,

(iv) Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule, and thus must ensure that any containers of hazardous chemicals leaving the laboratory are labeled in accordance with paragraph (f)(1) of this section, and that a material safety data sheet is provided to distributors and other employers in accordance with paragraphs (g)(6) and (g)(7) of this section.

(4) In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

(i) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(ii) Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and,

(iii) Employers shall ensure that employees are provided with information and training in accordance with paragraph (h) of this section (except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

(5) This section does not require labeling of the following chemicals:

(i) Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

(ii) Any chemical substance or mixture as such terms are defined in the Toxic Substances Control Act (15 U.S.C. 2601 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

(iii) Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (e.g. flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or the Virus-Serum-Toxin Act of 1913 (21 U.S.C. 151 et seq.), and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or the Department of Agriculture;

(iv) Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms;

(v) Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and,

(vi) Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 et seq.) and the labeling regulations issued under that Act by the Department of Agriculture.

(6) This section does not apply to: (i) Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that Act by the Environmental Protection Agency;

(ii) Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation and Liability ACT (CERCLA) (42 U.S.C. 9601 et seq.) when the hazardous substance is the focus of remedial or removal action being conducted under

CERCLA in accordance with Environmental Protection Agency regulations.

(iii) Tobacco or tobacco products;

(iv) Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);

(v) Articles (as that term is defined in paragraph (c) of this section);

(vi) Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;

(vii) Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (e.g., tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (e.g., over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (e.g., first aid supplies);

(viii) Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

(ix) Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

(x) Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section;

(xi) Ionizing and nonionizing radiation; and,

(xii) Biological hazards.

(c) Definitions.

Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very

small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Chemical means any element, chemical compound or mixture of elements and/or compounds.

Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.

Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Combustible liquid means any liquid having a flashpoint at or above 100 °F (37.8 °C), but below 200 °F (93.3 °C), except any mixture having components with flashpoints of 200 °F (93.3 °C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Commercial account means an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

Compressed gas means:

(i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 °F (21.1 °C); or

(ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 °F (54.4 °C) regardless of the pressure at 70 °F (21.1 °C); or

(iii) A liquid having a vapor pressure exceeding 40 psi at 100 °F (37.8 °C) as determined by ASTM D-323-72.

Container means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as

a designated representative without regard to written employee authorization.

Director means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

Employee means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

Employer means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Exposure or exposed means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g. accidental or possible) exposure. "Subjected" in terms of health hazards includes any route of entry (e.g. inhalation, ingestion, skin contact or absorption.)

Flammable means a chemical that falls into one of the following categories:

(i) Aerosol, flammable means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) Gas, flammable means: (A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;

(iii) Liquid, flammable means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) Solid, flammable means a solid, other than a blasting agent or explosive as defined in ^U 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously

and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

Hazardous chemical means any chemical which is a physical hazard or a health hazard.

Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for "physical hazard" and "health hazard" to determine the hazards which must be covered.)

Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants,

corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

Identity means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

Immediate use means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Importer means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

Label means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Material safety data sheet (MSDS) means written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of this section.

Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

Organic peroxide means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer means a chemical other than a blasting agent or explosive as defined in ^U 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

Produce means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

Pyrophoric means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency

procedures, if necessary.

Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D sets out the criteria to be used in evaluating trade secrets.

Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Use means to package, handle, react, emit, extract, generate as a byproduct, or transfer.

Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

Workplace means an establishment, job site, or project, at one geographical location containing one or more work areas.

(d) Hazard determination. (1) Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

(2) Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

(3) The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

(i) 29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or,

(ii) Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition). The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of this standard.

(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(i) National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition);

(ii) International Agency for Research on Cancer (IARC) Monographs (latest editions); or

(iii) 29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Note: The Registry of Toxic Effects of Chemical Substances published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

(5) The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

(i) If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

(ii) If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under paragraph (d)(4) of this section;

(iii) If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

(iv) If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health

risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

(6) Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director. The written description may be incorporated into the written hazard communication program required under paragraph (e) of this section.

(e) Written hazard communication program. (1) Employers shall develop, implement, and maintain at each workplace, a written hazard communication program which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

(i) A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,

(ii) The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

(2) Multi-employer workplaces. Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:

(i) The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;

(ii) The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,

(iii) The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

(3) The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this paragraph (e).

(4) The employer shall make the written hazard communication program available, upon request, to employees, their designated

representatives, the Assistant Secretary and the Director, in :ordance with the requirements of 29 CFR 1910.20 (e).

(5) Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the written hazard communication program may be kept at the primary workplace facility.

(f) Labels and other forms of warning. (1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

(i) Identity of the hazardous chemical(s);

(ii) Appropriate hazard warnings; and

(iii) Name and address of the chemical manufacturer, importer, or other responsible party.

(2)(i) For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

(ii) The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment; and,

(iii) This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).

(3) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation.

(4) If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(5) Except as provided in paragraphs (f)(6) and (f)(7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

(i) Identity of the hazardous chemical(s) contained therein; and,

(ii) Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

(6) The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(7) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

(8) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(9) The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

(10) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

(11) Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped

or introduced into the workplace again.

(g) Material safety data sheets. (1) Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use.

(2) Each material safety data sheet shall be in English (although the employer may maintain copies in other languages as well), and shall contain at least the following information:

(i) The identity used on the label, and, except as provided for in paragraph (i) of this section on trade secrets:

(A) If the hazardous chemical is a single substance, its chemical and common name(s);

(B) If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,

(C) If the hazardous chemical is a mixture which has not been tested as a whole:

(1) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d) of this section shall be listed if the concentrations are 0.1% or greater; and,

(2) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than 1% (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and,

(3) The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

(ii) Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

(iii) The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

(iv) The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

(v) The primary route(s) of entry;

(vi) The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended

by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

(vii) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA;

(viii) Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

(ix) Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

(x) Emergency and first aid procedures;

(xi) The date of preparation of the material safety data sheet or the last change to it; and,

(xii) The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(3) If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

(4) Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

(5) The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer

shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

(6)(i) Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated;

(ii) The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;

(iii) If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible; and,

(iv) The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

(7)(i) Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated;

(ii) The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment;

(iii) Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available;

(iv) Wholesale distributors selling hazardous chemicals to employers over-the-counter may also provide material safety data sheets upon the request
of the employer at the time of the over-the-counter purchase, and shall post a sign or otherwise inform such employers that a material safety data sheet is available;

(v) If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (i.e., the retail distributor does not have commercial accounts and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained;

(vi) Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request;

and,

(vii) Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

(8) The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

(9) Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

(10) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in in their work area(s).

(11) Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.20(e). The Director shall also be given access to material safety data sheets in the same manner.

(h) Employee information and training. (1) Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

(2) Information. Employees shall be informed of:

(i) The requirements of this section;

(ii) Any operations in their work area where hazardous chemicals

are present; and,

(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

(3) Training. Employee training shall include at least:

(i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(ii) The physical and health hazards of the chemicals in the work area;

(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

(i) Trade secrets. (1) The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

(i) The claim that the information withheld is a trade secret can be supported;

(ii) Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

(iii) The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

(iv) The specific chemical identity is made available to health professionals, employees, and designated representatives in accordance with the applicable provisions of this paragraph.

(2) Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (i)

(3) and (4) of this section, as soon as circumstances permit.

(3) In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (i)(1) of this section, to a health professional (i.e. physician, industrial hygienist, toxicologist, epidemiologist, or occupational health nurse) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

(i) The request is in writing;

(ii) The request describes with reasonable detail one or more of the following occupational health needs for the information:

(A) To assess the hazards of the chemicals to which employees will be exposed;

(B) To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

(C) To conduct pre-assignment or periodic medical surveillance of exposed employees;

(D) To provide medical treatment to exposed employees;

(E) To select or assess appropriate personal protective equipment for exposed employees;

(F) To design or assess engineering controls or other protective measures for exposed employees; and,

(G) To conduct studies to determine the health effects of exposure.

(iii) The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representative, would not satisfy the purposes described in paragraph (i)(3)(ii) of this section:

(A) The properties and effects of the chemical;

(B) Measures for controlling workers' exposure to the chemical;

(C) Methods of monitoring and analyzing worker exposure to the chemical; and,

(D) Methods of diagnosing and treating harmful exposures to the chemical;

(iv) The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

(v) The health professional, and the employer or contractor of the services of the health professional (i.e. downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional, employee, or designated representative, will not use the trade secret information for

any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (i)(6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

(4) The confidentiality agreement authorized by paragraph (i)(3)(iv) of this section:

(i) May restrict the use of the information to the health purposes indicated in the written statement of need;

(ii) May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

(iii) May not include requirements for the posting of a penalty bond.

(5) Nothing in this standard is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

(6) If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

(7) If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

(i) Be provided to the health professional, employee, or designated representative, within thirty days of the request;

(ii) Be in writing;

(iii) Include evidence to support the claim that the specific chemical identity is a trade secret;

(iv) State the specific reasons why the request is being denied; and,

(v) Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

(8) The health professional, employee, or designated representative whose request for information is denied under paragraph (i)(3) of this section may refer the request and the written denial of the request to OSHA for consideration.

(9) When a health professional, employee, or designated representative refers the denial to OSHA under paragraph (i)(8) of this section, OSHA shall consider the evidence to determine if:

(i) The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

(ii) The health professional, employee, or designated representative has supported the claim that there is a medical or occupational health need for the information; and,

(iii) The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

(10)(i) If OSHA determines that the specific chemical identity requested under paragraph (i)(3) of this section is not a bona fide trade secret, or that it is a trade secret, but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by OSHA.

(ii) If a chemical manufacturer, importer, or employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

(11) If a citation for a failure to release specific chemical identity information is contested by the chemical manufacturer, importer, or employer, the matter will be adjudicated before the Occupational Safety and Health Review Commission in accordance with the Act's enforcement scheme and the applicable Commission rules of procedure. In accordance with the Commission rules, when a chemical manufacturer, importer, or employer continues to withhold the information during the contest, the Administrative Law Judge may review the citation and supporting documentation in camera or issue appropriate orders to protect the confidentiality of such matters.

(12) Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

(13) Nothing in this paragraph shall be construed as requiring the disclosure under any circumstances of process or percentage

of mixture information which is a trade secret.

(j) Effective dates. Chemical manufacturers, importers, distributors, and employers shall be in compliance with all provisions of this section by March 11, 1994.

Appendix A to ^U 1910.1200-Health Hazard Definitions (Mandatory)

Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g. flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body-such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees-such as shortness of breath, a non-measurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures, and are of short duration. "Chronic" effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1988)-irritation, corrosivity, sensitization and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposure, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover

only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and protected from them. Appendix B, which is also mandatory, outlines the principles and procedures of hazard assessment.

For purposes of this section, any chemicals which meet any of the following definitions, as determined by the criteria set forth in Appendix B are health hazards. However, this is not intended to be an exclusive categorization scheme. If there are available scientific data that involve other animal species or test methods, they must also be evaluated to determine the applicability of the HCS.

1. Carcinogen: A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or

(b) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or,

(c) It is regulated by OSHA as a carcinogen.

2. Corrosive: A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described by the U.S. Department of Transportation in appendix A to 49 CFR part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

3. Highly toxic: A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD50) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing

between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

4. Irritant: A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

5. Sensitizer: A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

6. Toxic. A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD50) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD50) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

7. Target organ effects.

The following is a target organ categorization of effects which may occur, including examples of signs and symptoms and chemicals which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.

a. Hepatotoxins: Chemicals which produce liver damage

Signs & Symptoms: Jaundice; liver enlargement

Chemicals: Carbon tetrachloride; nitrosamines

b. Nephrotoxins: Chemicals which produce kidney damage

Signs & Symptoms: Edema; proteinuria

Chemicals: Halogenated hydrocarbons; uranium

c. Neurotoxins: Chemicals which produce their primary toxic effects on the nervous system

Signs & Symptoms: Narcosis; behavioral changes; decrease in motor functions

Chemicals: Mercury; carbon disulfide

d. Agents which act on the blood or hemato-poietic system: Decrease hemoglobin function; deprive the body tissues of oxygen

Signs & Symptoms: Cyanosis; loss of consciousness

Chemicals: Carbon monoxide; cyanides

e. Agents which damage the lung: Chemicals which irritate or damage pulmonary tissue

Signs & Symptoms: Cough; tightness in chest; shortness of breath

Chemicals: Silica; asbestos

f. Reproductive toxins: Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis)

Signs & Symptoms: Birth defects; sterility

Chemicals: Lead; DBCP

g. Cutaneous hazards: Chemicals which affect the dermal layer of the body

Signs & Symptoms: Defatting of the skin; rashes; irritation

Chemicals: Ketones; chlorinated compounds

h. Eye hazards: Chemicals which affect the eye or visual capacity

Signs & Symptoms: Conjunctivitis; corneal damage

Chemicals: Organic solvents; acids

Appendix B to ^U 1910.1200-Hazard Determination (Mandatory)

The quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination. The hazard determination requirement of this standard is performance-oriented. Chemical manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, but they must be able to demonstrate that they have adequately ascertained the hazards of the chemicals produced or imported in accordance with the criteria set forth in this Appendix.

Hazard evaluation is a process which relies heavily on the professional judgment of the evaluator, particularly in the area of chronic hazards. The performance-orientation of the hazard determination does not diminish the duty of the chemical manufacturer, importer or employer to conduct a thorough evaluation, examining all relevant data and producing a scientifically defensible evaluation. For purposes of this standard, the following criteria shall be used in making hazard determinations that meet the requirements of this standard.

1. Carcinogenicity: As described in paragraph (d)(4) of this section and Appendix A of this section, a determination by the National Toxicology Program, the International Agency for Research on Cancer, or OSHA that a chemical is a carcinogen or potential carcinogen will be considered conclusive evidence for purposes of this section. In addition, however, all available scientific data on carcinogenicity must be evaluated in accordance with the provisions of this Appendix and the requirements of the rule.

2. Human data: Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation.

3. Animal data: Human evidence of health effects in exposed populations is generally not available for the majority of chemicals produced or used in the workplace. Therefore, the available results of toxicological testing in animal populations shall be used to predict the health effects that may be experienced by exposed workers. In particular, the definitions of certain acute hazards refer to specific animal testing results (see Appendix A).

4. Adequacy and reporting of data. The results of any studies which are designed and conducted according to established scientific principles, and which report statistically significant conclusions regarding the health effects of a chemical, shall be a sufficient

basis for a hazard determination and reported on any material safety data sheet. In vitro studies alone generally do not form the basis for a definitive finding of hazard under the HCS since they have a positive or negative result rather than a statistically significant finding.

The chemical manufacturer, importer, or employer may also report the results of other scientifically valid studies which tend to refute the findings of hazard.

Appendix C to ^U 1910.1200-Information Sources (Advisory)

The following is a list of available data sources which the chemical manufacturer, importer, distributor, or employer may wish to consult to evaluate the hazards of chemicals they produce or import:

-Any information in their own company files, such as toxicity testing results or illness experience of company employees.
-Any information obtained from the supplier of the chemical, such as material safety data sheets or product safety bulletins.
-Any pertinent information obtained from the following source list (latest editions should be used):

Condensed Chemical Dictionary
Van Nostrand Reinhold Co., 135 West 50th Street, New York, NY 10020.

The Merck Index: An Encyclopedia of Chemicals and Drugs
Merck and Company, Inc., 126 E. Lincoln Ave., Rahway, NJ 07065.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man
Geneva: World Health Organization, International Agency for Research on Cancer, 1972-Present. (Multivolume work). Summaries are available in supplement volumes. 49 Sheridan Street, Albany, NY 12210.

Industrial Hygiene and Toxicology, by F.A. Patty
John Wiley & Sons, Inc., New York, NY (Multivolume work).

Clinical Toxicology of Commercial Products
Gleason, Gosselin, and Hodge.

Casarett and Doull's Toxicology; The Basic Science of Poisons
Doull, Klaassen, and Amdur, Macmillan Publishing Co., Inc.,

New York, NY.

Industrial Toxicology, by Alice Hamilton and Harriet L. Hardy
Publishing Sciences Group, Inc., Acton, MA.

Toxicology of the Eye, by W. Morton Grant
Charles C. Thomas, 301-327 East Lawrence Avenue, Springfield, IL.

Recognition of Health Hazards in Industry
William A. Burgess, John Wiley and Sons, 605 Third Avenue, New York, NY 10158.

Chemical Hazards of the Workplace
Nick H. Proctor and James P. Hughes, J.P. Lipincott Company, 6 Winchester Terrace, New York, NY 10022.

Handbook of Chemistry and Physics
Chemical Rubber Company, 18901 Cranwood Parkway, Cleveland, OH 44128.

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices with Intended Changes
American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Avenue, Bldg. D-5, Cincinnati, OH 45211.

Information on the physical hazards of chemicals may be found in publications of the National Fire Protection Association, Boston, MA.

Note: The following documents may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Occupational Health Guidelines
NIOSH/OSHA (NIOSH Pub. No. 81-123).

NIOSH Pocket Guide to Chemical Hazards
NIOSH Pub. No. 90-117.

Registry of Toxic Effects of Chemical Substances
(Latest edition)

Miscellaneous Documents published by the National Institute for Occupational Safety and Health:
Criteria documents.

Special Hazard Reviews.
Occupational Hazard Assessments.
Current Intelligence Bulletins.

OSHA's General Industry Standards (29 CFR Part 1910)

NTP Annual Report on Carcinogens and Summary of the Annual Report on Carcinogens.
National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; (703) 487-4650.

Bibliographic data bases service provider	File name
Bibliographic Retrieval Services (BRS), 1200 Route 7, Latham, NY 12110.	Biosis Previews
	CA Search
	Medlars
	NTIS
	Hazardline
	American Chemical Society Journal
	Excerpta Medica
	IRCS Medical Science Journal
	Pre-Med
	Intl Pharmaceutical Abstracts
	Paper Chem
Lockheed-DIALOG Information Service, Inc., 3460 Hillview Avenue, Palo Alto, CA 94304.	Biosis Prev. Files
	CA Search Files
	CAB Abstracts
	Chemical Exposure
	Chemname
	Chemsis Files
	Chemzero
	Embase Files
	Environmental Bibliographies

	Enviroline
	Federal Research in Progress
	IRL Life Science Collection
	NTIS
	Occupational Safety and Health (NIOSH)
	Paper Chem
SDC-ORBIT, SDC Information Service, 2500 Colorado Avenue, Santa Monica, CA 90406.	CAS Files
	Chemdex, 2, 3
	NTIS
National Library of Medicine ..... Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD 20209.	Hazardous Substances Data Bank (NSDB)
	Medline Files
	Toxline Files
	Cancerlit
	RTECS
	Chemline
Pergamon International Information Corp., 1340 Old Chain Bridge Rd., McLean, VA 22101.	Laboratory Hazard Bulletin
Questel, Inc., 1625 Eye Street, NW, Suite 818, Washington, DC 20006.	CIS/ILO
	Cancernet
Chemical Information System ICI (ICIS), Bureau of National Affairs, 1133 15th Street, NW, Suite 300, Washington, DC 20005.	Structure and Nomenclature Search System (SANSS)
	Acute Toxicity (RTECS)
	Clinical Toxicology of Commercial Products
	Oil and Hazardous Materials Technical Assistance Data System
	CCRIS
	CESARS
Occupational Health Services, 400 Plaza Drive, Secaucus, NJ 07094.	MSDS
	Hazardline

Appendix D to ^U 1910.1200-Definition of "Trade Secret" (Mandatory)

The following is a reprint of the Restatement of Torts section 757, comment b (1939):

b. Definition of trade secret. A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers. It differs from other secret information in a business (see s759 of the Restatement of Torts which is not included in this Appendix) in that it is not simply information as to single or ephemeral events in the conduct of the business, as, for example, the amount or other terms of a secret bid for a contract or the salary of certain employees, or the security investments made or contemplated, or the date fixed for the announcement of a new policy or for bringing out a new model or the like. A trade secret is a process or device for continuous use in the operations of the business. Generally it relates to the production of goods, as, for example, a machine or formula for the production of an article. It may, however, relate to the sale of goods or to other operations in the business, such as a code for determining discounts, rebates or other concessions in a price list or catalogue, or a list of specialized customers, or a method of bookkeeping or other office management.

Secrecy. The subject matter of a trade secret must be secret. Matters of public knowledge or of general knowledge in an industry cannot be appropriated by one as his secret. Matters which are completely disclosed by the goods which one markets cannot be his secret. Substantially, a trade secret is known only in the particular business in which it is used. It is not requisite that only the proprietor of the business know it. He may, without losing his protection, communicate it to employees involved in its use. He may likewise communicate it to others pledged to secrecy. Others may also know of it independently, as, for example, when they have discovered the process or formula by independent invention and are keeping it secret. Nevertheless, a substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring the information. An exact definition of a trade secret is not possible. Some factors to be considered in determining whether given information is one's trade secret are: (1) The extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved

in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and his competitors; (5) the amount of effort or money expended by him in developing the information; (6) the ease or difficulty with which the information could be properly acquired or duplicated by others.

Novelty and prior art. A trade secret may be a device or process which is patentable; but it need not be that. It may be a device or process which is clearly anticipated in the prior art or one which is merely a mechanical improvement that a good mechanic can make. Novelty and invention are not requisite for a trade secret as they are for patentability. These requirements are essential to patentability because a patent protects against unlicensed use of the patented device or process even by one who discovers it properly through independent research. The patent monopoly is a reward to the inventor. But such is not the case with a trade secret. Its protection is not based on a policy of rewarding or otherwise encouraging the development of secret processes or devices. The protection is merely against breach of faith and reprehensible means of learning another's secret. For this limited protection it is not appropriate to require also the kind of novelty and invention which is a requisite of patentability. The nature of the secret is, however, an important factor in determining the kind of relief that is appropriate against one who is subject to liability under the rule stated in this Section. Thus, if the secret consists of a device or process which is a novel invention, one who acquires the secret wrongfully is ordinarily enjoined from further use of it and is required to account for the profits derived from his past use. If, on the other hand, the secret consists of mechanical improvements that a good mechanic can make without resort to the secret, the wrongdoer's liability may be limited to damages, and an injunction against future use of the improvements made with the aid of the secret may be inappropriate.

Appendix E to ^U 1910.1200 (Advisory)-Guidelines for Employer Compliance

The Hazard Communication Standard (HCS) is based on a simple concept-that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. The HCS is designed to provide employees with the information they need.

Knowledge acquired under the HCS will help employers provide safer workplaces for their employees. When employers have information

about the chemicals being used, they can take steps to reduce exposures, substitute less hazardous materials, and establish proper work practices. These efforts will help prevent the occurrence of work-related illnesses and injuries caused by chemicals.

The HCS addresses the issues of evaluating and communicating hazards to workers. Evaluation of chemical hazards involves a number of technical concepts, and is a process that requires the professional judgment of experienced experts. That's why the HCS is designed so that employers who simply use chemicals, rather than produce or import them, are not required to evaluate the hazards of those chemicals. Hazard determination is the responsibility of the producers and importers of the materials. Producers and importers of chemicals are then required to provide the hazard information to employers that purchase their products.

Employers that don't produce or import chemicals need only focus on those parts of the rule that deal with establishing a workplace program and communicating information to their workers. This appendix is a general guide for such employers to help them determine what's required under the rule. It does not supplant or substitute for the regulatory provisions, but rather provides a simplified outline of the steps an average employer would follow to meet those requirements.

1. Becoming Familiar With The Rule.

OSHA has provided a simple summary of the HCS in a pamphlet entitled "Chemical Hazard Communication," OSHA Publication Number 3084. Some employers prefer to begin to become familiar with the rule's requirements by reading this pamphlet. A copy may be obtained from your local OSHA Area Office, or by contacting the OSHA Publications Office at (202) 523-9667.

The standard is long, and some parts of it are technical, but the basic concepts are simple. In fact, the requirements reflect what many employers have been doing for years. You may find that you are already largely in compliance with many of the provisions, and will simply have to modify your existing programs somewhat. If you are operating in an OSHA-approved State Plan State, you must comply with the State's requirements, which may be different than those of the Federal rule. Many of the State Plan States had hazard communication or "right-to-know" laws prior to promulgation of the Federal rule. Employers in State Plan States should contact their State OSHA offices for more information regarding applicable requirements.

The HCS requires information to be prepared and transmitted regarding all hazardous chemicals. The HCS covers both physical hazards (such as flammability), and health hazards (such as irritation, lung damage, and cancer). Most chemicals used in

the workplace have some hazard potential, and thus will be covered by the rule.

One difference between this rule and many others adopted by OSHA is that this one is performance-oriented. That means that you have the flexibility to adapt the rule to the needs of your workplace, rather than having to follow specific, rigid requirements. It also means that you have to exercise more judgment to implement an appropriate and effective program.

The standard's design is simple. Chemical manufacturers and importers must evaluate the hazards of the chemicals they produce or import. Using that information, they must then prepare labels for containers, and more detailed technical bulletins called material safety data sheets (MSDS).

Chemical manufacturers, importers, and distributors of hazardous chemicals are all required to provide the appropriate labels and material safety data sheets to the employers to which they ship the chemicals. The information is to be provided automatically. Every container of hazardous chemicals you receive must be labeled, tagged, or marked with the required information. Your suppliers must also send you a properly completed material safety data sheet (MSDS) at the time of the first shipment of the chemical, and with the next shipment after the MSDS is updated with new and significant information about the hazards.

You can rely on the information received from your suppliers. You have no independent duty to analyze the chemical or evaluate the hazards of it.

Employers that "use" hazardous chemicals must have a program to ensure the information is provided to exposed employees. "Use" means to package, handle, react, or transfer. This is an intentionally broad scope, and includes any situation where a chemical is present in such a way that employees may be exposed under normal conditions of use or in a foreseeable emergency.

The requirements of the rule that deal specifically with the hazard communication program are found in this section in paragraphs (e), written hazard communication program; (f), labels and other forms of warning; (g), material safety data sheets; and (h), employee information and training. The requirements of these paragraphs should be the focus of your attention. Concentrate on becoming familiar with them, using paragraphs (b), scope and application, and (c), definitions, as references when needed to help explain the provisions.

There are two types of work operations where the coverage of the rule is limited. These are laboratories and operations where chemicals are only handled in sealed containers (e.g., a warehouse). The limited provisions for these workplaces can be found in paragraph (b) of this section, scope and application.

Basically, employers having these types of work operations need only keep labels on containers as they are received; maintain material safety data sheets that are received, and give employees access to them; and provide information and training for employees. Employers do not have to have written hazard communication programs and lists of chemicals for these types of operations.

The limited coverage of laboratories and sealed container operations addresses the obligation of an employer to the workers in the operations involved, and does not affect the employer's duties as a distributor of chemicals. For example, a distributor may have warehouse operations where employees would be protected under the limited sealed container provisions. In this situation, requirements for obtaining and maintaining MSDSs are limited to providing access to those received with containers while the substance is in the workplace, and requesting MSDSs when employees request access for those not received with the containers. However, as a distributor of hazardous chemicals, that employer will still have responsibilities for providing MSDSs to downstream customers at the time of the first shipment and when the MSDS is updated. Therefore, although they may not be required for the employees in the work operation, the distributor may, nevertheless, have to have MSDSs to satisfy other requirements of the rule.

2. Identify Responsible Staff

Hazard communication is going to be a continuing program in your facility. Compliance with the HCS is not a "one shot deal." In order to have a successful program, it will be necessary to assign responsibility for both the initial and ongoing activities that have to be undertaken to comply with the rule. In some cases, these activities may already be part of current job assignments. For example, site supervisors are frequently responsible for on-the-job training sessions. Early identification of the responsible employees, and involvement of them in the development of your plan of action, will result in a more effective program design. Evaluation of the effectiveness of your program will also be enhanced by involvement of affected employees.

For any safety and health program, success depends on commitment at every level of the organization. This is particularly true for hazard communication, where success requires a change in behavior. This will only occur if employers understand the program, and are committed to its success, and if employees are motivated by the people presenting the information to them.

3. Identify Hazardous Chemicals in the Workplace.

The standard requires a list of hazardous chemicals in the workplace as part of the written hazard communication program.

The list will eventually serve as an inventory of everything for which an MSDS must be maintained. At this point, however, preparing the list will help you complete the rest of the program since it will give you some idea of the scope of the program required for compliance in your facility.

The best way to prepare a comprehensive list is to survey the workplace. Purchasing records may also help, and certainly employers should establish procedures to ensure that in the future purchasing procedures result in MSDSs being received before a material is used in the workplace.

The broadest possible perspective should be taken when doing the survey. Sometimes people think of "chemicals" as being only liquids in containers. The HCS covers chemicals in all physical forms-liquids, solids, gases, vapors, fumes, and mists-whether they are "contained" or not. The hazardous nature of the chemical and the potential for exposure are the factors which determine whether a chemical is covered. If it's not hazardous, it's not covered. If there is no potential for exposure (e.g., the chemical is inextricably bound and cannot be released), the rule does not cover the chemical.

Look around. Identify chemicals in containers, including pipes, but also think about chemicals generated in the work operations. For example, welding fumes, dusts, and exhaust fumes are all sources of chemical exposures. Read labels provided by suppliers for hazard information. Make a list of all chemicals in the workplace that are potentially hazardous. For your own information and planning, you may also want to note on the list the location(s) of the products within the workplace, and an indication of the hazards as found on the label. This will help you as you prepare the rest of your program.

Paragraph (b) of this section, scope and application, includes exemptions for various chemicals or workplace situations. After compiling the complete list of chemicals, you should review paragraph (b) of this section to determine if any of the items can be eliminated from the list because they are exempted materials. For example, food, drugs, and cosmetics brought into the workplace for employee consumption are exempt. So rubbing alcohol in the first aid kit would not be covered.

Once you have compiled as complete a list as possible of the potentially hazardous chemicals in the workplace, the next step is to determine if you have received material safety data sheets for all of them. Check your files against the inventory you have just compiled. If any are missing, contact your supplier and request one. It is a good idea to document these requests, either by copy of a letter or a note regarding telephone conversations. If you have MSDSs for chemicals that are not on your list, figure

out why. Maybe you don't use the chemical anymore. Or maybe you missed it in your survey. Some suppliers do provide MSDSs for products that are not hazardous. These do not have to be maintained by you.

You should not allow employees to use any chemicals for which you have not received an MSDS. The MSDS provides information you need to ensure proper protective measures are implemented prior to exposure.

4. Preparing and Implementing a Hazard Communication Program

All workplaces where employees are exposed to hazardous chemicals must have a written plan which describes how the standard will be implemented in that facility. Preparation of a plan is not just a paper exercise-all of the elements must be implemented in the workplace in order to be in compliance with the rule. See paragraph (e) of this section for the specific requirements regarding written hazard communication programs. The only work operations which do not have to comply with the written plan requirements are laboratories and work operations where employees only handle chemicals in sealed containers. See paragraph (b) of this section, scope and application, for the specific requirements for these two types of workplaces.

The plan does not have to be lengthy or complicated. It is intended to be a blueprint for implementation of your program-an assurance that all aspects of the requirements have been addressed.

Many trade associations and other professional groups have provided sample programs and other assistance materials to affected employers. These have been very helpful to many employers since they tend to be tailored to the particular industry involved. You may wish to investigate whether your industry trade groups have developed such materials.

Although such general guidance may be helpful, you must remember that the written program has to reflect what you are doing in your workplace. Therefore, if you use a generic program it must be adapted to address the facility it covers. For example, the written plan must list the chemicals present at the site, indicate who is to be responsible for the various aspects of the program in your facility, and indicate where written materials will be made available to employees.

If OSHA inspects your workplace for compliance with the HCS, the OSHA compliance officer will ask to see your written plan at the outset of the inspection. In general, the following items will be considered in evaluating your program.

The written program must describe how the requirements for labels and other forms of warning, material safety data sheets,

and employee information and training, are going to be met in your facility. The following discussion provides the type of information compliance officers will be looking for to decide whether these elements of the hazard communication program have been properly addressed:

A. Labels and Other Forms of Warning

In-plant containers of hazardous chemicals must be labeled, tagged, or marked with the identity of the material and appropriate hazard warnings. Chemical manufacturers, importers, and distributors are required to ensure that every container of hazardous chemicals they ship is appropriately labeled with such information and with the name and address of the producer or other responsible party. Employers purchasing chemicals can rely on the labels provided by their suppliers. If the material is subsequently transferred by the employer from a labeled container to another container, the employer will have to label that container unless it is subject to the portable container exemption. See paragraph (f) of this section for specific labeling requirements.

The primary information to be obtained from an OSHA-required label is an identity for the material, and appropriate hazard warnings. The identity is any term which appears on the label, the MSDS, and the list of chemicals, and thus links these three sources of information. The identity used by the supplier may be a common or trade name ("Black Magic Formula"), or a chemical name (1,1,1,-trichloroethane). The hazard warning is a brief statement of the hazardous effects of the chemical ("flammable," "causes lung damage"). Labels frequently contain other information, such as precautionary measures ("do not use near open flame"), but this information is provided voluntarily and is not required by the rule. Labels must be legible, and prominently displayed. There are no specific requirements for size or color, or any specified text.

With these requirements in mind, the compliance officer will be looking for the following types of information to ensure that labeling will be properly implemented in your facility:

1. Designation of person(s) responsible for ensuring labeling of in-plant containers;
2. Designation of person(s) responsible for ensuring labeling of any shipped containers;
3. Description of labeling system(s) used;
4. Description of written alternatives to labeling of in-plant containers (if used); and,
5. Procedures to review and update label information when necessary.

Employers that are purchasing and using hazardous chemicals-

rather than producing or distributing them-will primarily be concerned with ensuring that every purchased container is labeled. If materials are transferred into other containers, the employer must ensure that these are labeled as well, unless they fall under the portable container exemption (paragraph (f)(7) of this section). In terms of labeling systems, you can simply choose to use the labels provided by your suppliers on the containers. These will generally be verbal text labels, and do not usually include numerical rating systems or symbols that require special training. The most important thing to remember is that this is a continuing duty-all in-plant containers of hazardous chemicals must always be labeled. Therefore, it is important to designate someone to be responsible for ensuring that the labels are maintained as required on the containers in your facility, and that newly purchased materials are checked for labels prior to use.

B. Material Safety Data Sheets

Chemical manufacturers and importers are required to obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Distributors are responsible for ensuring that their customers are provided a copy of these MSDSs. Employers must have an MSDS for each hazardous chemical which they use. Employers may rely on the information received from their suppliers. The specific requirements for material safety data sheets are in paragraph (g) of this section.

There is no specified format for the MSDS under the rule, although there are specific information requirements. OSHA has developed a non-mandatory format, OSHA Form 174, which may be used by chemical manufacturers and importers to comply with the rule. The MSDS must be in English. You are entitled to receive from your supplier a data sheet which includes all of the information required under the rule. If you do not receive one automatically, you should request one. If you receive one that is obviously inadequate, with, for example, blank spaces that are not completed, you should request an appropriately completed one. If your request for a data sheet or for a corrected data sheet does not produce the information needed, you should contact your local OSHA Area Office for assistance in obtaining the MSDS.

The role of MSDSs under the rule is to provide detailed information on each hazardous chemical, including its potential hazardous effects, its physical and chemical characteristics, and recommendations for appropriate protective measures. This information should be useful to you as the employer responsible for designing protective programs, as well as to the workers. If you are not familiar with material safety data sheets and with chemical terminology, you may need to learn to use them yourself. A glossary of MSDS

terms may be helpful in this regard. Generally speaking, most employers using hazardous chemicals will primarily be concerned with MSDS information regarding hazardous effects and recommended protective measures. Focus on the sections of the MSDS that are applicable to your situation.

MSDSs must be readily accessible to employees when they are in their work areas during their workshifts. This may be accomplished in many different ways. You must decide what is appropriate for your particular workplace. Some employers keep the MSDSs in a binder in a central location (e.g., in the pick-up truck on a construction site). Others, particularly in workplaces with large numbers of chemicals, computerize the information and provide access through terminals. As long as employees can get the information when they need it, any approach may be used. The employees must have access to the MSDSs themselves-simply having a system where the information can be read to them over the phone is only permitted under the mobile worksite provision, paragraph (g)(9) of this section, when employees must travel between workplaces during the shift. In this situation, they have access to the MSDSs prior to leaving the primary worksite, and when they return, so the telephone system is simply an emergency arrangement.

In order to ensure that you have a current MSDS for each chemical in the plant as required, and that employee access is provided, the compliance officers will be looking for the following types of information in your written program:

1. Designation of person(s) responsible for obtaining and maintaining the MSDSs;
2. How such sheets are to be maintained in the workplace (e.g., in notebooks in the work area(s) or in a computer with terminal access), and how employees can obtain access to them when they are in their work area during the work shift;
3. Procedures to follow when the MSDS is not received at the time of the first shipment;
4. For producers, procedures to update the MSDS when new and significant health information is found; and,
5. Description of alternatives to actual data sheets in the workplace, if used.

For employers using hazardous chemicals, the most important aspect of the written program in terms of MSDSs is to ensure that someone is responsible for obtaining and maintaining the MSDSs for every hazardous chemical in the workplace. The list of hazardous chemicals required to be maintained as part of the written program will serve as an inventory. As new chemicals are purchased, the list should be updated. Many companies have found it convenient to include on their purchase orders the

name and address of the person designated in their company to receive MSDSs.

C. Employee Information and Training

Each employee who may be "exposed" to hazardous chemicals when working must be provided information and trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. "Exposure" or "exposed" under the rule means that "an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.) and includes potential (e.g., accidental or possible) exposure." See paragraph (h) of this section for specific requirements. Information and training may be done either by individual chemical, or by categories of hazards (such as flammability or carcinogenicity). If there are only a few chemicals in the workplace, then you may want to discuss each one individually. Where there are large numbers of chemicals, or the chemicals change frequently, you will probably want to train generally based on the hazard categories (e.g., flammable liquids, corrosive materials, carcinogens). Employees will have access to the substance-specific information on the labels and MSDSs.

Information and training is a critical part of the hazard communication program. Information regarding hazards and protective measures are provided to workers through written labels and material safety data sheets. However, through effective information and training, workers will learn to read and understand such information, determine how it can be obtained and used in their own workplaces, and understand the risks of exposure to the chemicals in their workplaces as well as the ways to protect themselves. A properly conducted training program will ensure comprehension and understanding. It is not sufficient to either just read material to the workers, or simply hand them material to read. You want to create a climate where workers feel free to ask questions. This will help you to ensure that the information is understood. You must always remember that the underlying purpose of the HCS is to reduce the incidence of chemical source illnesses and injuries. This will be accomplished by modifying behavior through the provision of hazard information and information about protective measures. If your program works, you and your workers will better understand the chemical hazards within the workplace. The procedures you establish regarding, for example, purchasing, storage, and handling of these chemicals will improve, and thereby reduce the risks posed to employees exposed to the chemical hazards involved. Furthermore, your workers' comprehension will also be increased, and proper work practices will be followed

in your workplace.

If you are going to do the training yourself, you will have to understand the material and be prepared to motivate the workers to learn. This is not always an easy task, but the benefits are worth the effort. More information regarding appropriate training can be found in OSHA Publication No. 2254 which contains voluntary training guidelines prepared by OSHA's Training Institute. A copy of this document is available from OSHA's Publications Office at (202) 219-4667.

In reviewing your written program with regard to information and training, the following items need to be considered:

1. Designation of person(s) responsible for conducting training;
2. Format of the program to be used (audiovisuals, classroom instruction, etc.);
3. Elements of the training program (should be consistent with the elements in paragraph (h) of this section); and,
4. Procedure to train new employees at the time of their initial assignment to work with a hazardous chemical, and to train employees when a new hazard is introduced into the workplace.

The written program should provide enough details about the employer's plans in this area to assess whether or not a good faith effort is being made to train employees. OSHA does not expect that every worker will be able to recite all of the information about each chemical in the workplace. In general, the most important aspects of training under the HCS are to ensure that employees are aware that they are exposed to hazardous chemicals, that they know how to read and use labels and material safety data sheets, and that, as a consequence of learning this information, they are following the appropriate protective measures established by the employer. OSHA compliance officers will be talking to employees to determine if they have received training, if they know they are exposed to hazardous chemicals, and if they know where to obtain substance-specific information on labels and MSDSs.

The rule does not require employers to maintain records of employee training, but many employers choose to do so. This may help you monitor your own program to ensure that all employees are appropriately trained. If you already have a training program, you may simply have to supplement it with whatever additional information is required under the HCS. For example, construction employers that are already in compliance with the construction training standard (29 CFR 1926.21) will have little extra training to do.

An employer can provide employees information and training through whatever means are found appropriate and protective. Although there would always have to be some training on-site

(such as informing employees of the location and availability of the written program and MSDSs), employee training may be satisfied in part by general training about the requirements of the HCS and about chemical hazards on the job which is provided by, for example, trade associations, unions, colleges, and professional schools. In addition, previous training, education and experience of a worker may relieve the employer of some of the burdens of informing and training that worker. Regardless of the method relied upon, however, the employer is always ultimately responsible for ensuring that employees are adequately trained. If the compliance officer finds that the training is deficient, the employer will be cited for the deficiency regardless of who actually provided the training on behalf of the employer.

D. Other Requirements

In addition to these specific items, compliance officers will also be asking the following questions in assessing the adequacy of the program:

Does a list of the hazardous chemicals exist in each work area or at a central location?

Are methods the employer will use to inform employees of the hazards of non-routine tasks outlined?

Are employees informed of the hazards associated with chemicals contained in unlabeled pipes in their work areas?

On multi-employer worksites, has the employer provided other employers with information about labeling systems and precautionary measures where the other employers have employees exposed to the initial employer's chemicals?

Is the written program made available to employees and their designated representatives?

If your program adequately addresses the means of communicating information to employees in your workplace, and provides answers to the basic questions outlined above, it will be found to be in compliance with the rule.

5. Checklist for Compliance

The following checklist will help to ensure you are in compliance with the rule:

Obtained a copy of the rule. ____
Read and understood the requirements. ____
Assigned responsibility for tasks. ____
Prepared an inventory of chemicals. ____
Ensured containers are labeled. ____
Obtained MSDS for each chemical. ____
Prepared written program. ____
Made MSDSs available to workers. ____

Conducted training of workers. ____
Established procedures to maintain current program. ____
Established procedures to evaluate effectiveness. ____

6. Further Assistance

If you have a question regarding compliance with the HCS, you should contact your local OSHA Area Office for assistance. In addition, each OSHA Regional Office has a Hazard Communication Coordinator who can answer your questions. Free consultation services are also available to assist employers, and information regarding these services can be obtained through the Area and Regional offices as well.

The telephone number for the OSHA office closest to you should be listed in your local telephone directory. If you are not able to obtain this information, you may contact OSHA's Office of Information and Consumer Affairs at (202) 219-8151 for further assistance in identifying the appropriate contacts.

[52 FR 31877, Aug. 24, 1987, as amended at 52 FR 46080, Dec. 4, 1987; 53 FR 15035, Apr. 27, 1988; 54 FR 24334, June 7, 1989; 54 FR 6888, Feb. 15, 1989]

ATTACHMENT 2
of Appendix 5

Chemical List

ATTACHMENT 2
of Appendix 5

Chemical List
Dutch Boy Site

Hazardous Substance Survey Form

Date Completed: _____

Chemical Name	CAS #	Manufacturer Name, Address, Phone #	Time Period Covered	Special Hazard (S) Env. Hazard (E)

_____ _____ _____

Person Completing Form Title Signature

ATTACHMENT 3
of Appendix 5

Information Acknowledgement Form

April 26, 1996

ATTACHMENT 3
of Appendix 5

Information Acknowledgment Form

I, _____, hereby acknowledge that the Material Safety Data Sheet(s) on
(Name)

_____

_____
(Name of Materials)

_____

have been provided and explained on _____.

_____
Signature

_____
SHSO Signature

ATTACHMENT 4
of Appendix 5

Hazard Communication Training Program

April 26, 1996

Hazard Communication Training Outline

I. Contents of the Hazard Communication Program.

II. Introduction and Purpose of OSHA's Hazard Communication Standard

III. Objectives of the Hazard Communication Education and Training Program.

IV. An Overview of Health Hazards

A. Hazard = Exposure x Toxicity

B. Routes of Entry

1. Ingestion - mouth

2. Inhalation - lungs

3. Absorption - skin

C. Dose and Symptoms of Effect

1. Dose = Concentration x Time

2. Dose response may be expressed as an effect produced by a substance within a specific time period.

3. <u>Threshold</u> - that concentration (dose) of a substance which produces <u>no</u> effect on a subject.

4. Symptoms

D. Acute and Chronic Effects

1. Acute

- large dose
- immediate response
- involves a short exposure period

2. Chronic

   - small repeated doses
   - delayed response
   - occurs over a long period of time.

E. Specific Types of Health Hazards

1. Irritants
2. Sensitizers
3. Carcinogens
4. Mutagens
5. Teratogens

F. Physical Hazards

1. Flammable
2. Combustible
3. Oxidizers
4. Explosives
5. Reactive

G. Exposure Standards

1. ACGIH TLV

   - TWA
   - STEL
   - Ceiling

2. OSHA-PEL

   - TWA
   - Ceiling

H. Warning Properties

V. Specific Hazardous Substances in the Workplace

A. Corrosives

B. Solvents

C. Poisons

D. Gases

VI. Material Safety Data Sheets (MSDSs)

- prepared by manufacturer
- discusses one chemical or a mixture of chemicals
- composed of 8 sections

Section 1:	Chemical identity, mfg. name
Section 2:	Hazardous ingredients
Section 3:	Physical properties
Section 4:	Fire and explosion hazard data
Section 5:	Reactivity
Section 6:	Health data, exposure standards
Section 7:	Spill procedures
Section 8:	Personal protective equipment

VII. Labeling

A. Hazard Communication Standard Requirements

1. Chemical name
2. Hazard Warning(s)

B. National Fire Protection Association (NFPA)

April 26, 1996

VIII. Methods used to evaluate exposure to chemicals

A. Industrial Hygiene Monitoring

1. Air Samples

- personal samples
- area samples
- grab (instantaneous)
- continuous (for a period of time)

2. Air Sampling Devices

- pumps
- detector tubes
- filter cassettes
- velometer

3. Bulk and Wipe Sample Applications

B. Medical Surveillance Programs

- monitor
- evaluate employee
- protect

1. Disease monitoring tests:
chest X-rays, pulmonary functions

2. Biological monitoring tests:
measure toxic substances in the blood

IX. Common methods used to prevent and control employee exposure to hazard substances

1. Elimination/Substitution

2. Enclosure

3. Isolation

4. Ventilation

5. Wet Methods

6. Personal Protective Equipment

   A. Respirators
   B. Clothing
   C. Eyewear

7. General Housekeeping and Good Hygiene Practices

8. Spill Response and Containment Procedures

9. First Aid

APPENDIX 6

Medical Data Sheet

April 26, 1996

Medical Data Sheet
Dutch Boy Site
Chicago, Illinois

This brief Medical Data Sheet will be completed by all on-site personnel. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project_____

Name_____ Home Telephone_____
Address_____

Age_____ Height_____ Weight_____

Person to contact in case of emergency_____

Particular sensitivities, e.g., drug allergies_____

_____

Do you wear contact lenses?_____

Do you have any significant medical conditions?_____

_____

_____

What medications are you presently using?_____

_____

Name, Address, and Phone Number of Personal Physician:

_____

APPENDIX 7

Bloodborne Pathogens

April 26, 1996

Bloodborne Pathogens

1. Description and Scope

Besides Hepatitis B and Human Immunodeficiency Virus (HIV), bloodborne pathogens include any pathogenic microorganism that is present in human blood and can infect and cause disease in person who are exposed to blood containing the pathogen.

This program covers all employees who are required to render medical assistance as part of their job duties. This primarily includes employees designated by ENVIRON to be responsible for rendering first aid at the Site.

2. Exposure Determination

The employees who are first aid trained and are required by ENVIRON to render first aid at specific job sites or locations will come under the Bloodborne Pathogens Exposure Control Policy. Not all employees are required to render first aid or Cardiopulmonary resuscitation (CPR), unless the performance of first aid is a part of an employee's designated job duty. Employees designated to render life saving actions include those who voluntarily take on first aid responsibilities, as part of their job description, and are available during normal work shifts.

3. Methods of Compliance

The best method for ensuring the health of workers at risk is to understand and follow the concept of universal precautions as it applies to an employee's duties and work practices. This concept refers to the assumption that all blood and bodily fluids are contaminated with pathogens. Instruction in Universal Precautions shall take place during initial and annual training CPR and First Aid training.

4. Engineering and Work Practice Controls

Hand washing is a primary work practice control. If this is not available or feasible, then alternative methods, such as antiseptic hand cleaners, in conjunction with clean cloths or paper towels, or antiseptic towels will be provided. When these alternative methods are used, employees shall wash their hands (or other affected areas) with soap and running water as soon as feasible thereafter.

5. Personal Protective Equipment

Latex or vinyl gloves shall be worn when first aid begins and until treatment stops. A mouth shield will also be used if CPR is administered. One should assume all patients may be infectious.

All medical wastes generated as result of administering first aid shall be placed in properly labeled containers and disposed of in a manner consistent with local and state regulatory requirements.

6. Hepatitis B Vaccination

Hepatitis B vaccinations will be made available as soon as possible, but in no event later than 24 hours, to all unvaccinated first aid providers who have rendered assistance in any situation involving the presence of blood or other potentially infectious material (OPIM) regardless of whether or not an actual exposure incident may have occurred. An investigation and a written report of the incident shall be on file.

7. Post-Exposure Evaluation and Follow-up

All first aid rendered incidents involving the presence of blood or OPIM must be reported to their supervisor before the end of the work shift during which the first aid care incident occurred. The report will have the following elements:

- The names of all first aid providers who rendered assistance, regardless of whether personal protective equipment was used.
- Description of the incident, including time and date.
- A determination of whether or not, in addition to the presence of blood or OPIM, an exposure incident occurred.
- Documentation of the route of exposure and the circumstance under which the exposure occurred.
- Identification and documentation of the source individual, unless this is not feasible or prohibited by law.
- The report shall be recorded on a list of such first aid care incidents. This report shall be available to all employees.

Collection and testing of blood for Hepatitis B and HIV serological status as well as other tests as deemed necessary will be provided to the exposed employee at no cost. Following any medical evaluation, the attending health care professional must provide the employee with a written opinion within 15 days. If the medical evaluation determines a positive exposure, then an injury/illness report shall be completed.

8. First Aid Incident Reporting Procedures

The reporting requirements are stringent when employees render first aid assistance in a situation that involves the presence of blood. The SHSO shall ensure that:

- A first-aid incident report is generated;
- A list of incidents where first aid assistance is rendered is established; and
- All reports of first aid care incidents are recorded on the list.

All other occupational exposure incidents involving exposure to bodily fluids or blood shall be recorded and maintained for each employee. For bloodborne pathogens, the following must also be included:

- Employee's name and social security number;
- Employees' Hepatitis B vaccination status, including vaccination dates and any medical records related to the employee's ability to receive vaccinations;
- Results of examination, medical testing, and post-exposure evaluation and follow-up procedures;
- Health care professional's written opinion; and
- A copy of the information provided to the health care professional. Employee records must be kept confidential and maintained for the duration of employment plus 30 years.